



**Janardan Bhagat Shikshan Prasarak Sanstha's
CHANGU KANA THAKUR
ARTS, COMMERCE & SCIENCE COLLEGE,
NEW PANVEL (AUTONOMOUS)**

**Re-accredited 'A+' Grade by NAAC
'College with Potential for Excellence' Status Awarded by UGC
'Best College Award' by University of Mumbai**

Program: B. A.

**Revised Syllabus of T.Y.B.A. English Literature
Choice Based Credit & Grading System (60:40)
w.e.f. Academic Year 2021-2022**

Details of the Course

Sr. No.	Heading	Particulars
1	Title of Course	16 th to 18 th Century English Literature – Paper IV (Semester V and VI)
2	Eligibility for Admission	
3	Passing marks	40%
4	Ordinances/Regulations (if any)	
5	No. of Semesters	Two
6	Level	U.G.
7	Pattern	Semester (60:40)
8	Status	Revised
9	To be implemented from Academic year	2021-2022

Preamble of the Syllabus:

English Literature is a perennial source of honing of new horizons depicted in life as well as society. The strategic and passionate study of English Literature plays an important role in the overall personality development of the learners. Literature has been an epitome of human life with its fluctuations, uncertainties and unpredictability since time immemorial. Therefore, it is inevitable to understand and appreciate various genres incorporated especially in the realm of English Literature. There is a strong desire to learn English literature in the mind of students on account of its international significance in today's digital arena.

There is reformation and transformation in the identity and personality of the students through the systematic understanding of characters especially protagonist as well as an antagonist represented in literary masterpieces.

The passionate delving of English Literature provides an insight into different perspectives humanity, materialism and spiritualism along with multiculturalism. It also empowers to the students to have an accurate perception about implications and applications of the so called "To be or not to Be, Analysis and Evaluation of Literary Texts, Word Classes, Phrases and Clauses, Romanticism, Classicism, Victorian epoch and Modernism".

The syllabus aims at inculcation of moral, social, ethical values, close reading of literary text, gender, class and race inequality and eradication of racial discrimination in the mind of students and make them awake and arise to accomplish incredible and commendable success through the wings of English Literature in academic as well as professional world.

Bachelor of Arts (B.A.) in English Literature is a under graduate course of department of English, Changu Kana Thakur Arts, Commerce & Science college, New Panvel (Autonomous) The Choice Based Credit and Grading System to be implemented through this curriculum would enable the students to examine

various world classics belonging to English Literature and appreciate it for overall personality development in 21st century.

Objectives of the Course:

- To introduce the students to English Literature of the 16th, 17th and 18th centuries.
- To acquaint the students with prominent writers belonging to Elizabethan era.
- To understand development of various genres of poetry and drama.
- To familiarize the students with salient features of writing styles.
- To enhance students understanding about characterization and themes depicted in world famous literary work.

Course Outcome: By the end of the course, a student should develop the Ability:

- To understand the distinctive features of English literature of the 16th, 17th and 18th centuries.
- To comprehend the relationship between era and writers creative thinking.
- To recognize universal truths and human values represented in World Classics.
- To appreciate development of various genres of English literature.
- To understand the dramatic devices used during the Elizabethan era.

Title of the Paper: 16th to 18th Century English Literature

T. Y. B. A. English Paper: IV

For the subject of English, there shall be two papers for 45 lectures each comprising of three units of 15 Lectures each.

Semester- V

1. Paper- IV Unit-I will be on Terms
2. Paper- IV Unit-II will be on Drama
3. Paper- IV Unit-III will be on Poetry

Semester- VI

1. Paper- IV Unit-I will be on Terms
2. Paper- IV Unit-II will be on Drama
3. Paper- IV Unit-III will be on Poetry

Scheme of Examination for Each Semester:

Internal Evaluation: 40 %

Sr.No.	Particular	Marks
01	One periodical class test/online examination to be conducted in the given semester	20 Marks
02	Any two tools out of these (10 Marks each) 1. Group/individual Survey Project 2. Presentation and write up on the selected topics of the subjects 3. Case studies/Test based on tutorials 4. Book Review/Poetry Appreciation/ Open Book Test 5. Quiz	20 Marks

Semester End Examination: 60 Marks will be as follows -:

I	Theory:	
	Each theory paper shall be of two- and half-hour duration.	
	All questions are compulsory and will have internal options. All questions carry equal marks	
	Q-1	From Unit – I (Short Notes any Two out of Four) 12 Marks
	Q-2	From Unit – II (Essay having Internal Options.) 12 Marks
	Q-3	From Unit – III (Essay having Internal Options.) 12 Marks
	Q-4	From Unit – II (Short Notes any Two out of Four) 12 Marks
	Q-5	From Unit – III Short Notes any Two out of Four) 12 Marks

Choice Based Credit Grading and Semester System (CBCGS)
T. Y. B. A. English – 16th to 18th Century English Literature Paper IV
Syllabus
To be implemented from the Academic year 2021-2022
SEMESTER V

Course Code	Unit	Topics	Credits	Lectures
UAR5ENG4	I Terms	<ul style="list-style-type: none"> • The Elizabethan Age (1550-1603) i. Renaissance ii. Elizabethan Poetry – Sonnets iii. Epic iv. Elizabethan Drama • The Jacobean Period (1603-1650) i. Characteristics of the Jacobean Period ii. Metaphysical Poetry iii. Jacobean Drama- Revenge Tragedy 	04	15
	II Drama	<ul style="list-style-type: none"> • William Shakespeare: Hamlet <li style="text-align: center;">OR • William Shakespeare: As you Like it 		15
	III Poetry	<ul style="list-style-type: none"> • Elizabethan Period Sir Philip Sidney i. Sonnet No. 1. Loving in Truth and Fain in Verse My Love to Show ii. Sonnet No. 9. Queen Virtue’s Court, which some call Stella’s Face 		15

		<p>William Shakespeare</p> <p>i. Sonnet No. 18 Shall I Compare Thee to a Summer's Day</p> <p>ii. Sonnet No. 130 My Mistress Eyes are Nothing Like the Sun</p> <p>• Jacobean Period</p> <p>John Donne</p> <p>i. The Sunne Rising</p> <p>ii. Death Be Not Proud</p> <p>George Herbert</p> <p>i. Pulley</p> <p>ii. Love</p>		
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Choice Based Credit Grading and Semester System (CBCGS)
T. Y. B. A. English – 16th to 18th Century English Literature Paper IV
Syllabus
To be implemented from the Academic year 2021-2022
SEMESTER VI

Course Code	Unit	Topics	Credits	Lectures
UAR6ENG4	I Terms	<ul style="list-style-type: none"> • The Restoration Period (1660-1700) i. Characteristics of Restoration Period ii. Restoration Poetry- Mock Epic iii. Restoration Drama- Comedy of Manners, iv. Heroic Tragedy • Neo-Classical Period (1700-1798) i) Neo- Classical/ Augustan Age ii) Age of Satire iii) Rise of the Periodical Essays 	3	15
	II Drama	<ul style="list-style-type: none"> • John Dryden: All for Love <li style="text-align: center;">OR • Oliver Goldsmith: She Stoops to Conquer 		15
	III Poetry	<p>John Milton:</p> <ul style="list-style-type: none"> i) On His Blindness ii) How Soon Hath Time, the Subtle Thief of Youth <p>Alexander Pope:</p> <ul style="list-style-type: none"> i. The Rape of the Lock Canto II Lines 1-54 <p>John Dryden:</p> <ul style="list-style-type: none"> i) Alexander's Feast ii) Can Life be a Blessing 		15

Reference Books:

1. Alpers, Paul E. *Elizabethan Poetry: Modern Essays in Criticism* (OUP: 1967)
2. Daiches, David. *A Critical History of English Literature* (Secker and Warburg: London, 1960)
3. Ford, Boris Ed. *The New Pelican Guide to English Literature: The Age of Shakespeare* Vol. 2 (Penguin, 1993) From Donne to Marvell Vol. 3 (Penguin, 1990)
4. Keast, William B. *Seventeenth Century English Poetry: Modern Essays in Criticism* (OUP: 1971)
5. King, Bruce. *Seventeenth Century English Literature* (Macmillan: 1983).
6. Leggatt, Alexander. *English Drama: Shakespeare to The Restoration 1590- 1660* (Longman: Literature in English Series, 1988)
7. Perfitt, George. *English Poetry of the Seventeenth Century* (Longman: Literature in English Series, 1992)
8. Parry, Graham. *The Seventeenth Century the Intellectual and Cultural Context of English Literature. 1603-1700* (Longman: Literature in English Series, 1989)
9. Pooley, Roger. *English Prose of the Seventeenth Century* (Longman: Literature in English Series, 1992)
10. Ricks, Christopher. *The Penguin History of English Literature* Vol.3. (Penguin, 1993)
11. Roston, Murray. *Sixteenth Century English Literature* (Macmillan, 1983)
12. Baugh, Albert C. *A Literary History of England, The Restoration and Eighteenth Century* (1660-1789), 2nd Edition, (London, Routledge and Kegan Paul, 1967)
13. Clifford, James L. Ed. *Eighteenth Century English Literature: Modern Essays in Criticism* (OUP, 1959)
14. Craig, Hardin. Ed. *A History of English Literature Series. Literature of the Restoration and the Eighteenth Century 1660-1798.* Vol III (London, Macmillan, 1969)
15. Ford, Boris. Ed. *The Pelican Guide To English Literature: From Dryden to Johnson,* Vol.4, (Penguin, 1982) & From Blake to Byron, Vol.5, (Penguin, 1982)
16. Jack, Ian. *Augustan Satire: Intention and Idiom in English Poetry 1660-1750* (OUP,1978)
17. Roger. *The Penguin History of English Literature: Dryden to Johnson.* Vol.4, (Penguin, 1993)
18. Probyn, Clive T. *English Fiction of The Eighteenth Century 1700-1789* (Longman

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Literature in English Series, 1987)

19. Novak, Maximillian E. *Eighteenth Century English Literature*, (Macmillan, 1983)
20. Sambrook, James. *The Eighteenth Century: The Intellectual and Cultural Context of English Literature 1700-1789*. (Longman Literature in English Series, 1986)
21. Sutherland, James. *A Preface to Eighteenth Century Poetry*, (OUP, 1975).

Details of the Course:

Sr. No.	Heading	Particulars
1	Title of Course	Literary Criticism – Paper V (Semester V and VI)
2	Eligibility for Admission	
3	Passing marks	40%
4	Ordinances/Regulations (if any)	
5	No. of Semesters	Two
6	Level	U.G.
7	Pattern	Semester (60:40)
8	Status	Revised
9	To be implemented from Academic year	2021-2022

Objectives of the Course:

- To introduce the learners to important critical terms.
- To make them aware of the nature and function of literature and criticism.
- To impart the technique of close reading of literary texts.
- To enable students to understand various literary theories and critical approaches.
- To familiarize the learners with the mechanism of application of theory to literary texts.

Course Outcome: By the end of the course, a student should develop the Ability:

- To understand use of important critical terms.
- Become aware the nature and function of literature and criticism.
- Impart the technique of close reading of literary texts.
- Understanding of various literary theories and critical approaches.
- To develop the skills of scansion and practical criticism.

Title of the Paper: Literary Criticism

T. Y. B. A. English Paper: V

For the subject of English, there shall be two papers for 45 lectures each comprising of three units of 15 Lectures each.

Semester- V

1. Paper- V Unit-I will be on Critical Terms
2. Paper- V Unit-II will be on Nature of Literature
3. Paper- V Unit-III will be on Functions of Literary Criticism
4. Paper- V Unit- IV will be on Scansion

Semester- VI

1. Paper- V Unit-I will be on Literary Terms
2. Paper- V Unit-II will be on Critical Approaches
3. Paper- V Unit-III will be on Critical Approaches
4. Paper- V Unit- IV will be on Practical Criticism

Scheme of Examination for Each Semester:

Internal Evaluation: 40 %

Sr.No.	Particular	Marks
01	One periodical class test/online examination to be conducted in the given semester	20 Marks
02	Any two tools out of these (10 Marks each) 1. Group/individual Survey Project 2. Presentation and write up on the selected topics of the subjects 3. Case studies/Test based on tutorials 4. Book Review/Poetry Appreciation/ Open Book Test 5. Quiz	20 Marks

Semester End Examination: 60 Marks will be as follows -:

I	Theory:	
	Each theory paper shall be of two- and half-hour duration.	
	All questions are compulsory and will have internal options. All questions carry equal marks	
	Q-1	From Unit – I (Short Notes any Two out of Four) 12 Marks
	Q-2	From Unit – II (Essay having Internal Options.) 12 Marks
	Q-3	From Unit – III (Essay having Internal Options.) 12 Marks
	Q-4	From Unit – II (Short Notes any Two out of Four) 12 Marks
	Q-5	From Unit – III Short Notes any Two out of Four) 12 Marks

Choice Based Credit Grading and Semester System (CBCGS)

T. Y. B. A. English –Literary Criticism Paper V Syllabus

To be implemented from the Academic year 2021-2022

SEMESTER V

Course Code	Unit	Topics	Credits	Lectures
UAR5ENG5	I Terms	<ul style="list-style-type: none">• Critical Terms:i. Simileii. Imageryiii. Symboliv. Paradoxv. Myth		15

	II Nature of Literature	<ul style="list-style-type: none">• Nature and Function of Literature <ol style="list-style-type: none">i. Literature as Imitation (Plato-Aristotle debate)ii. Literature and Imagination (the Romantic Idea of the Imagination)iii. Literature as an expression of the writer's personality	04	15
	III Nature and Functions of Literary Criticism	<ul style="list-style-type: none">• Nature and function of Literary Criticism <ol style="list-style-type: none">i. Nature of Literary Criticismii. Functions of Literary Criticism (Explication, Analysis, Interpretation, Evaluation, Theorizing)iii. Qualification / Role of a Critic		15

	IV Scansion	<ul style="list-style-type: none">• Practical Criticism: Scansion <p>Two short passages of poetry (6 to 10 lines each) will be set for scansion. Students should scan the poem, identify the base metre (iamb, trochee), variations (pyrrhic, spondee, anapaest, dactyl, cretic, etc.), rhyme scheme, stanza forms if any, and the metrical peculiarities such as end-stopped lines, run-on lines, caesura and other basic concepts of versification. (5 marks for scanning and identifying the base metre, 4 marks for identifying modulations and other metrical peculiarities and 1 mark for rhyme scheme)</p>		15
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To be implemented from the Academic year 2021-2022
SEMESTER VI

Course Code	Unit	Topics	Credits	Lectures
UAR6ENG5	I Terms	<ul style="list-style-type: none"> • Literary Movements: i. Classicism ii. Romanticism iii. Realism iv. Naturalism v. Aestheticism 	04	15
	II Critical Approaches	<ul style="list-style-type: none"> • Critical Approaches: i. New Criticism ii. Structuralism iii. Psychoanalytic Criticism 		15
	III Critical Approaches	<ul style="list-style-type: none"> • Critical Approaches i. Feminist Criticism ii. Marxist Criticism iii. Eco Criticism 		15
	IV Practical Criticism	<ul style="list-style-type: none"> • Practical Criticism: <p>Critical Appreciation of an unseen poem: A short poem of about 20 lines will be set for appreciation. The title of the poem will be given. The unit will test the students' responsiveness to the poem and their linguistic ability in analysing the poem. Students are expected to mobilize the techniques of close reading and their understanding of</p>		15

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		literary devices like imagery, metaphor and other poetic devices while learning this unit.)		
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References:

1. Abrams, M. H. *A Glossary of Literary Terms*. (8th Edition) New Delhi: Akash Press, 2007.
2. Abrams, M. H. *The Mirror and the Lamp: Romantic Theory and Critical Tradition*. Oxford: OUP, 1971 Ashcroft, Bill et al. (ed.) *The Post-Colonial Studies Reader*. London: Routledge, 1995.
3. Baldick, Chris. *The Oxford Dictionary of Literary Terms*. Oxford: OUP, 2001. Blackstone, Bernard. *Practical English Prosody*. Mumbai: Orient Longman, 1984.
4. Bodkin, Maud. *Archetypal Patterns in Poetry*. London: Oxford University Press, 1934.
5. Buell, Lawrence. *The Environmental Imagination: Thoreau, Nature Writing, and the Formation of American Culture*. MA: Harvard University Press, 1995.
6. Daiches, David. *Critical Approaches to Literature*. London: Longman, 1984.
7. Drew, Elizabeth. *Understanding Poetry*. New York: Norton, 1959.
8. Dutton, Richard. *Introduction to Literary Criticism*. London: Longman, 1984.
9. Eagleton, Terry. *Literary Theory*. London: Basil Blackwell, 1983.
10. Enid, Hamer. *The Metres of English Poetry*. Books way, 2014
11. Garrard, Greg. *Ecocriticism*. New York: Routledge, 2012.
12. Garrard, Greg, ed. *The Oxford Handbook of Ecocriticism*. New York: OUP, 2014.
13. Guerin, Wilfred et al. *A Handbook of Critical Approaches to Literature*. Oxford: OUP, 1999.
14. Enright, D.J. and Chickera, E. *English Critical Texts*. Delhi: Oxford University Press, 1962.
15. Fowler, Roger (ed.) (rev.) *A Dictionary of Modern Critical Terms*. London: Routledge & Kegan Paul, 1987.
16. Frye, Northrop. "The Archetypes of Literature." *The Norton Anthology: Theory and Criticism*. Ed. Vincent B. Leitch. New York: Norton, 2001.
17. Habib, M.A.R. *A History of Literary Criticism: From Plato to the Present*. London: Blackwell, 2005.
18. Hudson, William Henry. *An Introduction to the Study of Literature*. New Delhi: Atlantic, 2007.
19. Jump, John (ed.) *Critical Idiom Series*. Methuen. Lentriccia, Frank. *After the New Criticism*. Chicago: Chicago UP, 1980.
20. Lodge, David (Ed.) *Twentieth Century Literary Criticism*. London: Longman, 1972.

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21. Lodge, David, with Nigel Wood. *Modern Criticism and Theory: A Reader*. 2nd Ed. London: Longman, 1988.
22. Nagarajan M. S. *English Literary Criticism and Theory: An Introductory History*. Hyderabad, Orient Black Swan, 2006.
23. Ramamurthi, Lalitha. *An Introduction to Literary Theory*. Chennai: University of Madras, 2006.
24. Richards, I. A. *Practical Criticism*. London: Kegan Paul, 1930.
25. Said, Edward. *Orientalism*. New York: Pantheon, 1978.
26. Schreiber, S. M. *Introduction to Literary Criticism*. Oxford: Pergamon Press, 1965.
27. Selden, Raman and Widdowson, Peter. *A Reader's Guide to Contemporary Literary Theory*. 3rd ed. Lexington: University of Kentucky Press, 1993.
28. Selden, Raman. *A Reader's Guide to Contemporary Literary Theory*. London: Harvester Press, 1985.
29. Scott, Wilbur. *Five Approaches to Literary Criticism*. London: Longman, 1984.
30. Wellek, Rene and Austin, Warren. *Theory of Literature*. London: Jonathan Cape, 1955.
31. Wolfreys, Julian. (ed.) *Introducing Literary Theories: A Guide and Glossary*. Edinburgh: Edinburgh University Press, 2003.

Details of the Course:

Sr. No.	Heading	Particulars
1	Title of Course	Grammar and Art of Writing VI (Semester V and VI)
2	Eligibility for Admission	
3	Passing marks	40%
4	Ordinances/Regulations (if any)	
5	No. of Semesters	Two
6	Level	U.G.
7	Pattern	Semester (60:40)
8	Status	Revised
9	To be implemented from Academic year	2021-2022

Objectives of the Course:

- To develop an insight into the process of word formation and transformation amongst learners
- To develop amongst students an understanding into the sounds, stress patterns and intonations in the English language to improve their speaking skills.
- To develop among learners an insight into the structure of the English language and to provide knowledge of the rules of grammar.
- To help students to learn grammatical analysis, description and the skills of sentence transformation.
- To introduce the mechanics of writing for effective writing for various domains.

Course Outcome: By the end of the course, a student should develop the Ability:

- To gain a basic understanding of phonetics, morphology and word transformation.
- To learn the difference between various units of grammar.
- To improve speaking skills
- To develop adequate knowledge of the rules of grammar, grammatical analysis and sentence transformation.
- To write effectively in various domains.

Title of the Paper: Grammar and Art of Writing

T. Y. B. A. English Paper: VI

For the subject of English, there shall six papers for 45 lectures each comprising of three units of 15 Lectures each.

Semester-V

1. Paper-VI Unit-I will be on Phonetics and Morphology
2. Paper-VI Unit-II will be on Words and Phrases
3. Paper- VI Unit-III will be on Art of Writing

Semester- VI

1. Paper- VI Unit-I will be on Grammar
2. Paper- VI Unit-II will be on Art of Writing
3. Paper- VI Unit-III will be on Types/ Domains of Writing

Scheme of Examination for Each Semester:

Internal Evaluation: 40 %

Sr.No.	Particular	Marks
01	One periodical class test/online examination to be conducted in the given semester	20 Marks
02	Any two tools out of these (10 Marks each) 1. Group/individual Survey Project 2. Presentation and write up on the selected topics of the subjects 3. Case studies/Test based on tutorials 4. Book Review/Poetry Appreciation/ Open Book Test 5. Quiz	20 Marks

T.Y.B.A. English Literature Syllabus

Semester End Examination: 60 Marks will be as follows -:

I	Theory:	
	Each theory paper shall be of two- and half-hour duration.	
	All questions are compulsory and will have internal options. All questions carry equal marks	
	Q-1	From Unit – I (Short Notes any Two out of Four) 12 Marks
	Q-2	From Unit – II (Essay having Internal Options.) 12 Marks
	Q-3	From Unit – III (Essay having Internal Options.) 12 Marks
	Q-4	From Unit – II (Short Notes any Two out of Four) 12 Marks
	Q-5	From Unit – III Short Notes any Two out of Four) 12 Marks

Choice Based Credit Grading and Semester System (CBCGS)
T. Y. B. A. English – Grammar and Art of Writing Paper VI Syllabus
To be implemented from the Academic year 2021-2022
SEMESTER V

Course Code	Unit	Topics	Credits	Lectures
UAR5ENG6	I Phonetics and Morphology	A. Phonetics i. English Vowels and Consonants (Difference between BRP and Indian English) ii. Diphthongs B. Morphology i. Free and Bound Morphemes ii. Root and stem iii. Inflection and Derivation iv. Morphological Analysis	3.5	15
	II Grammar: Words and Phrases	i. Open word classes: nouns, adjectives, verbs, adverbs ii. Closed word classes: pronouns, determiners, operator verbs, prepositions, conjunctions, enumerators, interjections. iii. Noun Phrase, Genitive Phrase, Prepositional Phrase, Adjective Phrase and Adverb Phrase iv. Verb Phrase		15

	III Art of Writing	<ul style="list-style-type: none">• Discourse Analysis<ul style="list-style-type: none">i. Tenorii. Modeiii. Domain• Mechanics of Writing<ul style="list-style-type: none">i. Understanding paragraph divisions and topic sentences of paragraphs• Writing for Print Media<ul style="list-style-type: none">i. Print – News Report		15
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Choice Based Credit Grading and Semester System (CBCGS)
T. Y. B. A. English – Grammar and Art of Writing Paper VI Syllabus
To be implemented from the Academic year 2021-2022
SEMESTER VI

Course Code	Unit	Topics	Credits	Lectures
UAR6ENG6	I Grammar	<ul style="list-style-type: none"> • Clauses: i. Clause elements and subject – verb concord ii. Basic clause patterns iii. Types of clauses: finite – non-finite (tensed – tenseless), independent – dependent (Main – Subordinated) iv. Kinds of subordinate clause: Noun clause, Prepositional Clause, Relative clause , Adverb Clause, Comparative Clause v. Co-ordinated Clauses • Sentences: i. Basic and Derived structures <p>Following rules to be studied – Fronting, Inversion, Substitution of PP for Indirect Object, Tag Questions, Postponement of the post modifier, Cleft Sentence, Existential Sentence</p>	3.5	15
	II Art of Writing	<ul style="list-style-type: none"> • Mechanics of Writing i. Characteristics of typical writing and typical speech ii. Cohesion and Coherence iii. Correct use of Articles, Prepositions, Adverbs, Adjectives 		15

		<p>iv. Common Errors – Grammatical, Syntactical, Lexical, Punctuation, Logical</p> <p>v. Writing a Thesis Statement</p> <ul style="list-style-type: none"> • Rhetorical Structures <p>i. Classification, Comparison – Contrast, Cause – Effect, Chronological and Spatial Ordering, Order of Importance, Statement and Elaboration, Restatement, Exemplification, Listing</p> <p>ii. Understanding connotations, using bias-free language, Avoiding jargon and archaic/ outdated language, Eliminating repetition and redundancy, Content Analysis and Rhetorical Devices</p>		
	<p>III Types/ Domains of Writing</p>	<p>i. Argumentative/ reflective writing</p> <p>ii. Analytical writing</p> <p>iii. Creative / Figurative writing</p> <p>iv. Advertisement /Body Copy writing</p>		<p>15</p>

Reference Books:

1. Payne, Lucile Vaughan. *The Lively Art of Writing*. New York: Mentor, 1969
2. Kleiser, Grenville. *The Art of Writing*. New Delhi: A P H, 2011
3. Trimble, John R. *Writing with Style, Conversations on the Art of Writing*. New Jersey: Prentice Hall, 1975
4. Bailey, Stephen. *Academic Writing: A Handbook for International Students*. New York: Routledge, 2011
5. Huddleson, Rodney and Pullum, Geoffrey. *A Student's Introduction to English Grammar*. New Delhi: Cambridge University Press, 2005
6. Leech, Geoffrey and Svartvik, Jan. *A Communicative Grammar of English*. New York: Routledge, 1975
7. Singh Sukhdev and Singh Balbir. *Grammar of the Modern English Language: A Resource Book*. New Delhi: Cambridge University Press India Pvt. Ltd., 2012
8. Turton, Nigel D. *A B C of Common Grammatical Errors*. New Delhi: Macmillan India Ltd., 1996
9. Sethi, J. and Dhamija, P.V. *A Course in Phonetics and Spoken English*. New Delhi: Prentice-Hall of India Private Ltd., 2006
10. Jones, Daniel. *Everyman's English Pronunciation Dictionary the English Language Books Society*, ELBS
11. Gimson, A. C. *An Introduction to the Pronunciation of English*. ELBS
12. Rahman, Tariq. *A General Introduction to Linguistics*. Orient Black swan
13. Crystal, David. *The Cambridge Encyclopaedia of Language*. Cambridge University Press
14. Crystal, David. *A Little Book of Language*. Orient Black swan.
15. Sreedharan, V. *How to Write Correct English*. New Delhi: Goodwill Publishing House
16. Lowe, Michelle and Graham, Ben. *Language and Power: A Resource Book for Students*. Orient Longman, 1998
17. Simpson, Paul and Mayr, Andrea. *Language and Power: A Resource Book for Students*. Routledge, Taylor & Francis Group, 2010
18. Mohan, Krishna and Raman, Meenakshi. *Advanced Communicative English: A Comprehensive Course for Undergraduate Learners*. New Delhi: Tata McGraw Hill Education Private Limited, 2010
19. Gurman, Pamela J. *Strategies for Successful Writing: Written Communication in the Modern World*. Pearson Custom Publishing.
20. *Grammar Handbook* (Capella University) available in pdf format at

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<http://www.capella.edu/interactivemedia/onlinewritingcenter/downloads/grammar.pdf>

21. Brighton, Laurel J. *The Structure of Modern English: A Linguistic Introduction* available in pdf format at <http://npu.edu.ua/e-8>

[book/book/djvu/A/iif_kgpm_The%20Structure%20of%20Modern%20English.pdf](http://npu.edu.ua/e-8/book/book/djvu/A/iif_kgpm_The%20Structure%20of%20Modern%20English.pdf)

22. *A Course in English Phonetics for English EFL Students* available in pdf format at [file:///C:/ADMIN/Desktop/A_Course_in_English_Phonetics%20\(1\).pdf](file:///C:/ADMIN/Desktop/A_Course_in_English_Phonetics%20(1).pdf)

Details of the Course:

Sr. No.	Heading	Particulars
1	Title of Course	19 th Century English Literature (Semester V and VI)
2	Eligibility for Admission	
3	Passing marks	40%
4	Ordinances/Regulations (if any)	
5	No. of Semesters	Two
6	Level	U.G.
7	Pattern	Semester (60:40)
8	Status	Revised
9	To be implemented from Academic year	2021-2022

Objectives of the Course:

- To introduce to students the major trends and ideas in the literature and culture of the Romantic and Victorian Eras.
- To help students understand the texts in the context of prevailing sociocultural conditions & their historical, political location.
- To familiarize and highlight major representative texts, genres, thematic concerns and select key concepts/terms pertaining to the respective periods.
- To help students apply a variety of critical, historical, and theoretical approaches to prescribed literary texts.
- To sensitize students to diverse sensibilities and humanitarian concerns through literature of the nineteenth century.

Course Outcome: By the end of the course, a student should develop the Ability:

- To view literary works in their dynamic interface with the background.
- To understand the literature of the 19th century as a complex outcome of artistic, intellectual and socio-political cross-currents.
- To appreciate poetry as mirroring private personality, protest and subsequently, public concerns.
- To view the development of the Victorian Novel as informed by Victorian morality as well as by larger democratic processes.
- To contextualize the impulses behind the significant emergence of women writing in the 19th century.

Title of the Paper: 19th Century English Literature
T. Y. B. A. English Paper: VII

For the subject of English, there shall be six papers for 45 lectures each comprising of three units of 15 Lectures each.

Semester- V

1. Paper- VII Unit-I will be on Terms
2. Paper- VII Unit-II will be on Poetry
3. Paper- VII Unit-III will be on Novel

Semester- VI

1. Paper- VII Unit-I will be on Terms
2. Paper- VII Unit-II will be on Poetry
3. Paper- VII Unit-III will be on Novel

Scheme of Examination for Each Semester:

Internal Evaluation: 40 %

Sr.No.	Particular	Marks
01	One periodical class test/online examination to be conducted in the given semester	20 Marks
02	Any two tools out of these (10 Marks each) 1. Group/individual Survey Project 2. Presentation and write up on the selected topics of the subjects 3. Case studies/Test based on tutorials 4. Book Review/Poetry Appreciation/ Open Book Test 5. Quiz	20 Marks

T.Y.B.A. English Literature Syllabus

Semester End Examination: 60 Marks will be as follows -:

I	Theory:	
	Each theory paper shall be of two- and half-hour duration.	
	All questions are compulsory and will have internal options. All questions carry equal marks	
	Q-1	From Unit – I (Short Notes any Two out of Four) 12 Marks
	Q-2	From Unit – II (Essay having Internal Options.) 12 Marks
	Q-3	From Unit – III (Essay having Internal Options.) 12 Marks
	Q-4	From Unit – II (Short Notes any Two out of Four) 12 Marks
	Q-5	From Unit – III Short Notes any Two out of Four) 12 Marks

Choice Based Credit Grading and Semester System (CBCGS)
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To be implemented from the Academic year 2021-2022
SEMESTER V

Course Code	Unit	Topics	Credits	Lectures
UAR5ENG7	I Terms	<ul style="list-style-type: none"> • Background i. Romanticism as a reaction to Neo-classicism ii. Influence of Rousseau and French Revolution iii. Survey of Literature: Novel, Poetry and Prose (Types, Trends and Characteristics) iv. Rise of women writers in the period • Concepts: i. Romanticism: Features ii. Romantic Imagination iii. German Transcendentalism iv. The Gothic Revival v. Medievalism vi. Pantheism 	04	15
	II Poetry	<ul style="list-style-type: none"> • William Blake: i. 'The Divine Image' from Songs of Innocence ii. 'The Tiger from Songs of Experience • William Wordsworth: i. The Solitary Reaper ii. I Wandered Lonely as Cloud 		15

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		<ul style="list-style-type: none">• P.B. Shelley:<ol style="list-style-type: none">i. Ozymandiasii. Ode to the West Wind• John Keats:<ol style="list-style-type: none">i. On First Looking into Chapman's Homer'ii. Ode to Autumn		
	III Novel	Jane Austen: Pride and Prejudice OR Ann Radcliffe: Mysteries of Udolpho's: A Romance		15

Choice Based Credit Grading and Semester System (CBCGS)
T. Y. B. A. English – 19th Century English Literature Paper VII Syllabus
To be implemented from the Academic year 2021-2022
SEMESTER VI

Course Code	Unit	Topics	Credits	Lectures
UAR6ENG7	I Terms	<ul style="list-style-type: none"> • Background i. Effects of Industrial Revolution ii. Middle class complacency and the rise of the working class iii. Age of Science, Age of Faith and Doubt (the Victorian Dilemma) iv. Survey of Literature of the period: Types, features and development (Novel, Poetry and Prose) <ul style="list-style-type: none"> • Concepts i. Utilitarianism ii. Darwinism iii. Victorian Concept of Morality iv. Aestheticism v. Pre-Raphaelitism vi. The Oxford Movement vii. Bildungsroman and the Victorian Novel 	04	15
	II Poetry	<ul style="list-style-type: none"> • Alfred Tennyson: From In Memoriam i. Lyric 7: Dark house by which once more I stand. ii. Lyric 54: Oh, yet we trust that somehow good 		15

		<ul style="list-style-type: none"> • Robert Browning: <ol style="list-style-type: none"> i. Porphyria’s Lover ii. My Last Duchess • Elizabeth Barrett Browning Sonnets from the Portuguese: <ol style="list-style-type: none"> i. ‘Sonnet 21’: ‘Say over again, and yet once over again’ • Matthew Arnold: <ol style="list-style-type: none"> i. Dover Beach • Thomas Hardy: <ol style="list-style-type: none"> i. Channel Firing ii. In Times of the Breaking of the Nations 		
	III Novel	<p>Charles Dickens: Oliver Twist OR</p> <p>Charlotte Bronte: Jane Eyre</p>		15

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The Details of the Course:

Sr. No.	Heading	Particulars
1	Title of Course	20 th Century British Literature – Paper VIII (Semester V and VI)
2	Eligibility for Admission	
3	Passing marks	40%
4	Ordinances/Regulations (if any)	
5	No. of Semesters	Two
6	Level	U.G.
7	Pattern	Semester (60:40)
8	Status	Revised
9	To be implemented from Academic year	2021-2022

Objectives of the Course:

- To expose students to literary genres, trends, and literary movements of Britain in the 20th Century.
- To help learners to understand the texts in the context of social, cultural, historical and political conditions of the Turn of the century
- To show the diverse range of subjects of modern British literature after the catastrophe of the World War I
- To enable students to create linkages between social and historical contexts and literary texts.
- To train students to develop skills for a critical and analytical understanding of the text.

Course Outcome: By the end of the course, a student should develop the Ability:

- Students will be equipped with comprehensive understanding of literary genres, trends and movements in 20th Century British Literature
- To enable them to understand the valuable co –relation between the sociocultural, economical and historical contexts; behind the literary production.
- To understand the complex nature different genres of the 20th century British Literature
- Students will acquire the discipline to become reflective and imaginative thinkers through a close, critical and analytical reading of the prescribed texts.
- To appreciate various genres of British Literature.

Title of the Paper: 20th Century British Literature

T. Y. B. A. English Paper: VIII

For the subject of English, there shall be six papers for 45 lectures each comprising of three units of 15 Lectures each.

Semester- V

1. Paper- VIII Unit-I will be on Terms
2. Paper- VIII Unit-II will be on Drama
3. Paper- VIII Unit-III will be on Poetry

Semester- VI

1. Paper- VIII Unit-I will be on Terms
2. Paper- VIII Unit-II will be on Novel
3. Paper- VIII Unit-III will be on Short Stories

Scheme of Examination for Each Semester:

Internal Evaluation: 40 %

Sr.No.	Particular	Marks
01	One periodical class test/online examination to be conducted in the given semester	20 Marks
02	Any two tools out of these (10 Marks each) 1. Group/individual Survey Project 2. Presentation and write up on the selected topics of the subjects 3. Case studies/Test based on tutorials 4. Book Review/Poetry Appreciation/ Open Book Test 5. Quiz	20 Marks

Semester End Examination: 60 Marks will be as follows -:

I	Theory:	
	Each theory paper shall be of two- and half-hour duration.	
	All questions are compulsory and will have internal options. All questions carry equal marks	
	Q-1	From Unit – I (Short Notes any Two out of Four) 12 Marks
	Q-2	From Unit – II (Essay having Internal Options.) 12 Marks
	Q-3	From Unit – III (Essay having Internal Options.) 12 Marks
	Q-4	From Unit – II (Short Notes any Two out of Four) 12 Marks
	Q-5	From Unit – III Short Notes any Two out of Four) 12 Marks

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SEMESTER V

Course Code	Unit	Topics	Credits	Lectures
UAR5ENG8	I Back ground Topics	i. Modernism ii. Imagism iii. Symbolism iv. War Poetry v. Movement Poets vi. Poetic Drama vii. Social Realism and its impact on English Drama viii. The Theatre of the Absurd	04	15
	II Drama	Harold Pinter: The Homecoming (1964) OR Bernard Shaw: Saint Joan (1923)		15
	III Poetry	<ul style="list-style-type: none"> • T.S. Eliot: <ul style="list-style-type: none"> i) 'The Hippopotamus ii) 'Portrait of a Lady' • W. B. Yeats: <ul style="list-style-type: none"> i) Leda and Swan ii) 'A Prayer for My Daughter' • W.H. Auden: <ul style="list-style-type: none"> i) The Unknown Citizen ii) 'In Memory of W.B. Yeats' • Wilfred Owen: <ul style="list-style-type: none"> i) Insensibility ii) Strange Meeting 		15

**Choice Based Credit Grading and Semester System (CBCGS)
T. Y. B. A. 20th Century British Literature Paper VIII Syllabus
To be implemented from the Academic year 2021-2022
SEMESTER VI**

Course Code	Unit	Topics	Credits	Lectures
UAR6ENG8	I Back ground Topics	i. Feminism in Modern Literature ii. Psychological Novel iii The rise of Science Fiction iv. Post World War II Novel v. Political Satire/Allegory as rising literary trends vi. Imperialism and Post colonialism in Modern British Fiction vii. Existentialism and Modern British Literature	04	15
	II Novel	George Orwell: 1984 OR Iris Murdoch: The Black Prince (1973)		15
	III Short Stories	<ul style="list-style-type: none"> • James Joyce: i. Eveline • Roald Dahl: ii. Lamb to the Slaughter • Graham Greene: i. The End of the Party • Angela Carter: i. The Courtship of Mr. Lyon 		15

Reference Books:

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56. Wilson, Colin. *The Angry Years: The Rise and Fall of Angry Young Men*. New York: Pavilion Books, 2014. Print.

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- <http://britishliteratureoverview.blogspot.in/2008/09/invisible-japanesegentlemen.html>
- <https://www.youtube.com/watch?v=K1sBQZfDh0I>
- <https://www.litcharts.com/lit/lamb-to-the-slaughter/summary-and-analysis>
- <https://www.cliffsnotes.com/literature/d/dubliners/summary-andanalysis/eveline>.
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Details of the Course:

Sr. No.	Heading	Particulars
1	Title of Course	Literature of Protest Paper IX (Semester V and VI)
2	Eligibility for Admission	
3	Passing marks	40%
4	Ordinances/Regulations (if any)	
5	No. of Semesters	Two
6	Level	U.G.
7	Pattern	Semester (60:40)
8	Status	Revised
9	To be implemented from Academic year	2021-2022

Objectives of the Course:

- To explore voices of discord, rhetoric and cultural contexts.
- To compare and contrast the artistic manoeuvres.
- To examine the protest spectrum in literature.
- To bring in panoramic understanding of global protest literature and ideologies.
- To learn the historical links between forms of protest and meanings of literature

Course Outcome: By the end of the course, a student should develop the Ability:

- To read and interpret cross cultural texts.
- To understand protest literature.
- To get sensitized towards global issues.
- To learn to look into past, correlate it to present and future.
- To understand the historicity of protest literature.

Title of the Paper: Literature of Protest

T. Y. B. A. English Paper: IX

For the subject of English, there shall be six papers for 45 lectures each comprising of three units of 15 Lectures each.

Semester- V

1. Paper- IX Unit-I will be on Terms
2. Paper- IX Unit-II will be on Autobiography
3. Paper- IX Unit-III will be on Short Stories

Semester- VI

1. Paper- IX Unit-I will be on Terms
2. Paper- IX Unit-II will be on Novel
3. Paper- IX Unit-III will be on Poetry

Scheme of Examination for Each Semester:

Internal Evaluation: 40 %

Sr.No.	Particular	Marks
01	One periodical class test/online examination to be conducted in the given semester	20 Marks
02	Any two tools out of these (10 Marks each) 1. Group/individual Survey Project 2. Presentation and write up on the selected topics of the subjects 3. Case studies/Test based on tutorials 4. Book Review/Poetry Appreciation/ Open Book Test 5. Quiz	20 Marks

Semester End Examination: 60 Marks will be as follows -:

I	Theory:	
	Each theory paper shall be of two- and half-hour duration.	
	All questions are compulsory and will have internal options. All questions carry equal marks	
	Q-1	From Unit – I (Short Notes any Two out of Four) 12 Marks
	Q-2	From Unit – II (Essay having Internal Options.) 12 Marks
	Q-3	From Unit – III (Essay having Internal Options.) 12 Marks
	Q-4	From Unit – II (Short Notes any Two out of Four) 12 Marks
	Q-5	From Unit – III Short Notes any Two out of Four) 12 Marks

Choice Based Credit Grading and Semester System (CBCGS)
T. Y. B. A. English – Literature of Protest Paper IX Syllabus
To be implemented from the Academic year 2021-2022
SEMESTER V

Course Code	Unit	Topics	Credits	Lectures
UAR5ENG9	I Back ground Topics	i..Literature and Protest ii. Politics and Language of Protest iii. Translation and Literature of Protest iv. Concept of Caste, Varna Theory and Division of Labour v. Concept of Race and Discrimination vi. Protest in African American, Dalit and Tribal Literature	3.5	15
	II Autobio graphy	Urmila Pawar: The Weave of My Life: (Translated by Maya Pandit) OR Barack Obama: Dreams from My Father		15
	III Short Stories	i. Death of a Rich Man ii. When the Sun God Refused to Set iii. Loneliness of An Ex-soldier iv. Confessions of a Graveyard Keeper (The stories are from Desperate Men and Women: Ten Dalits Short Stories from India, edited by Rangrao, B., Kalpaz Publications, 2013)		15

Choice Based Credit Grading and Semester System (CBCGS)
T. Y. B. A. English – Literature of Protest Paper IX Syllabus
To be implemented from the Academic year 2021-2022
SEMESTER VI

Course Code	Unit	Topics	Credits	Lectures
UAR6ENG9	I Back ground Topics	i. Marathi Literature ii. Tamil Literature iii. Gujrati Literature iv. Kannada Literature v. Hindi Literature vi. Bengali Literature	3.5	15
	II Novel	Harriet Beecher Stowe: Uncle Tom's Cabin- OR Y.B.Satyanarayana: My Father Baliah		15
	III Poetry	<ul style="list-style-type: none"> • Kamala Das: i. The Looking Glass ii. An Introduction • Meena Kandasamy: i. Advaita: The Ultimate Question, ii. The Gods Wake Up • Jyoti Lanjewar: i. The Nameless Ones (anamikas), ii. Caves, 		15

References:

1. Ambedkar B. R., 1978, *Dr. Babasaheb Ambedkar's Writings and Speeches*, vol 1, Education Department, Government of Maharashtra, Bombay
2. Lohia, Rammanohar, 1964, *The Caste System*, Rammanohar Lohia Samta Vidyalaya Nyas, Hyderabad.
3. Dangle, Arjun. *Poisoned Bread: Translations from Modern Marathi Dalit Literature*. Orient Longman, 1992 –
4. Faye, Harrison. *The Persistent Power of "Race" in the Cultural and Political Economy of Racism*. Annual Review of Anthropology 24:47-74.
5. Nath, J.P., 2002, *Socialist Leadership in India*, Kanishka Publishers, New Delhi
6. Sharan Kumar Limbale and Jaydeep Sarangi, 2018. *Dalit Voice: Literature and Revolt*. Authors Press, New Delhi Zoe,
7. Trodd. *American Protest Literature*. 2008. Belknap Press of Harvard University Press.
8. Drake, Kimberly. *Literature of Protest*. 2013. Salem Press.
9. Patricia D. Netzley 1999, *Social Protest Literature: An Encyclopaedia of Works, Characters, Authors, and Themes*. ABC-CLIO Literary Companion
10. Faye, Harrison. 2008. *Outsider Within: Reworking Anthropology in the Global Age*. Urbana: University of Illinois Press.
11. Guru, Gopal, 2008. *Humiliation: Claims and Context*. Oxford University Press Delhi.
12. Hilliard, Nunn, 1998. Representing African Women in Movies in J. D. Hamlet (Ed.), *Afrocentric Visions: Studies in Culture and Communication*. Sage Publications. USA.
13. Bhowmik, Davinder & Steve Rabson. 2016. *Islands of Protest: Japanese Literature from Okinawa* University of Hawai Press.
14. Reed, T.V. "Introduction" and "Reflections on the Cultural Study of Social Movements." in *The Art of Protest: Culture and Activism from the Civil Rights Movement to the Streets of Seattle*. Minneapolis: University of Minnesota Press, 2005.



Janardan Bhagat Shikshan Prasarak Sanstha's
CHANGU KANA THAKUR
ARTS, COMMERCE & SCIENCE COLLEGE, NEW PANVEL
(AUTONOMOUS)

Re-accredited 'A+' Grade by NAAC
'College with Potential for Excellence' Status Awarded by UGC
'Best College Award' by University of Mumbai

Program: B.A.

Revised Syllabus of T.Y.B.A. Economics
Choice Based Credit & Grading System (75:25)
w.e.f. Academic Year 2021-22

Sr. No.	Heading	Particulars
1	Title of Course	Economics
2	Eligibility for Admission	S.Y.B.A
3	Passing marks	40%
4	Ordinances/Regulations (if any)	
5	No. of Semesters	Two
6	Level	U.G.
7	Pattern	Semester (75:25)
8	Status	Revised
9	To be implemented from Academic year	2021-2022

Revised Syllabus of Courses of T.Y.B.A. Programme at Semester V&VI with Effect from the Academic Year 2021-2022

Preamble

This course is designed to introduce the students to elementary concepts in microeconomics. The student should be able to use these concepts to understand the relevance of microeconomics to the real world. The student should be able to build on these concepts in the future to develop deeper understanding of the Economy as well as the revised syllabus is framed to understand the economic theory and its relevance in decision making.

Scheme of Evaluation

The performance of the learners will be evaluated in two Components. One component will be the Internal Assessment component carrying 25 marks and the second component will be the Semester-wise End Examination component carrying 75 marks. The allocation of marks for the Internal Assessment and Semester End Examinations will be as shown below:-

A) Internal Assessment: 25 marks

Question Paper Pattern

(Internal Assessment- Courses without Practical Courses)

Sr. No.	Particular	Marks
1	One class test (20 Marks)	20 Marks
2	Active participation in routine class instructional deliveries and overall conduct as a responsible learner, mannerism and articulation and exhibit of leadership qualities in organizing related academic activities	05 Marks

B) External Assessment

Question Paper Pattern

Maximum Marks: 75 Questions to be set : 05 Duration : 2 ½ Hrs

All Questions are Compulsory Carrying 15 Marks each.

Question No	Particular	Marks
Q-1	Attempt Any 2 out of 3 A. Full Length Question B. Full Length Question C. Full Length Question	15 Marks
Q-2	Attempt Any 2 out of 3 A. Full Length Question B. Full Length Question C. Full Length Question	15 Marks
Q-3	Attempt Any 2 out of 3 A. Full Length Question B. Full Length Question C. Full Length Question	15 Marks
Q-4	Attempt Any 2 out of 3 A. Full Length Question B. Full Length Question C. Full Length Question	15 Marks
Q-5	Attempt Any 2 out of 4 A. Short Notes B. Short Notes C. Short Notes D. Short Notes	15 Marks

SEMESTER –V

COURSE CODE	PAPER TITLE	CREDITS	MARKS
UAR5EC4	ADVANCED MICROECONOMICS	4	100
UAR5EC5	ECONOMICS OF GROWTH AND DEVELOPMENT	4	100
UAR5EC6	ECONOMICS OF AGRICULTURE AND CO-OPERATION	3.5	100
	INDUSTRIAL AND LABOUR ECONOMICS		
UAR5EC7	RESEARCH METHODOLOGY	4	100
UAR5EC8	ENVIRONMENTAL ECONOMICS	4	100
UAR5EC9	HISTORY OF ECONOMIC THOUGHT	3.5	100

(SEMESTER-VI)

COURSE CODE	PAPER TITLE	CREDIT	MARKS
UAR6EC4	ADVANCED MACROECONOMICS	4	100
UAR6EC5	INTERNATIONAL ECONOMICS	4	100
UAR6EC6	ECONOMICS OF AGRICULTURE AND CO-OPERATION	3.5	100
	INDUSTRIAL AND LABOUR ECONOMICS		
UAR6EC7	RESEARCH METHODOLOGY	4	100
UAR6EC8	ENVIRONMENTAL ECONOMICS	4	100
UAR6EC9	HISTORY OF ECONOMIC THOUGHT	3.5	100

ADVANCED MICROECONOMICS: PAPER IV

SEMESTER –V

COURSE CODE	PAPER TITLE	CREDITS	MARKS
UAR5EC4	ADVANCED MICRO ECONOMICS	4	100

Course Objectives –

The course is designed to provide sound understanding in micro economic theory. Since students have been taught perfect competition, this course focuses on three main pillars of microeconomics such as imperfect competition, welfare economics and information economics.

Course Outcomes

- Enables students will get knowledge on new market structure, imperfect competition.
- Provides understanding on the welfare economics and economics of information.

Module 1: General Equilibrium and Welfare Economics (12 Lectures)

Concept of General Equilibrium and Walrasian General Equilibrium Model - Pareto Optimality – The Pareto Optimality Condition of Social Welfare - Marginal Conditions for Pareto Optimal Resource Allocation - Perfect Competition and Pareto Optimality - Arrow’s Impossibility Theorem

Module 2: Market Structure: Monopoly and Monopolistic Competition (14 Lectures)

Concept of Monopoly - Measurement of Monopoly Power - Price Discrimination: Types and Classification of Price Discrimination (Degrees of Price Discrimination) - Equilibrium under discriminating Monopoly - Regulation of Monopoly Market Product Differentiation in Monopolistic Competition - Chamberlin’s Alternative approach- Equilibrium under Monopolistic Competition - Excess Capacity

Module 3: Oligopoly (12 Lectures)

The Cournot Model - Meaning and Characteristics of Oligopoly Market - Rigid Prices - The Sweezy Model of Kinked Demand Curve - Collusive Oligopoly - Cartel: Centralised and Market Sharing Cartel - Imperfect Collusion- Price Leadership Models, Game Theory - Prisoner’s Dilemma, Nash Equilibrium and Dominant Strategy Equilibrium

Module 4: Information Economics (12 Lectures)

Economics of Search and Search Cost - The Theory of Asymmetric Information-The Market for Lemons and Adverse Selection - Risk Preference and Expected Utility - The Problem of Moral Hazard - Market Signaling - Principal-Agent Problem

References:

1. Jhingan MLL. (2012), Advanced Economic Theory, Vrinda Publications, Delhi.
2. Mankiw N. Gregory (2015), Principles of Microeconomics, Cengage Learning.
3. Mansfield, Edwin (1985), Micro-economics: Theory & Applications, 5th edition, W.W. Norton & Company, New York.
4. Patil K. A (Second edition, 2011, Marathi), Advanced Economic Theory-Micro Analysis, Shri Mangesh Prakashan, Nagpur.

5. Salvatore D. (2006), Microeconomics: Theory and Applications, Oxford University Press, New Delhi.
6. Varian Hal R. (8 Edition 2010) Intermediate Microeconomics A Modern Approach, East-West Press, New Delhi

ECONOMICS OF GROWTH AND DEVELOPMENT (SEMESTER-V) PAPER NO - V

COURSE CODE	PAPER TITLE	CREDIT	MARKS
UAR5EC5	ECONOMICS OF GROWTH AND DEVELOPMENT	4	100

Course Objectives -

This paper introduces the concepts, theories, process and policies regarding growth and development. The meaning of the development as it has evolved over the years is clarified. The contemporary as well as classical theories of growth, development, and underdevelopment are considered in detail. Theories and issues related to population, poverty, inequality and human capital are considered. Urban and rural aspects of the development process studied. Importance of technology, infrastructure and planning in development process are considered. The approach has been to cover all important areas of development economics.

Course Outcomes -

- Enable students to apply and analyze issues in the development process.
- Students will be able to identify the issues related to Growth and Development
- Students will be able to understand the policy options and analyzed the Measures taken for the Development of an economy.

Module1: Meaning of Economic Growth and Development (12 Lectures)

Concepts of Economic Growth and Development- Distinction between Economic Growth and Development- Concept of Human Development- H.D.I, G.D.I, Green GDP- Sen's Capability approach- Millennium Development Goals (MDGs)- Initiative by Indian government towards MDGs.

Module 2: Theories of Economic Development (12 Lectures)

Rostow's stages of growth; Big Push Theory- Leibenstein's Critical Minimum Effort Thesis - Harrod - Domar Growth Model- Lewis Model of unlimited supply of labour - Ragner Nurkse's Theory of Disguised Unemployment- Schumpeter's Theory of Development

Module 3: Structural Issues in Development Process (12 Lectures)

Concept of Human Capital- Role of Education, Health and nutrition in Human Capital - Meaning and Measurement of Poverty and Inequality- Measures to eradicate poverty and Inequality - Meaning of Inclusive growth - SHG and Microfinance- Migration – Urbanization- Formal and Informal Sector- Urban Informal Sector Module

4: Planning, Technology and Economic Development (12 Lectures)

Concept and Role of infrastructure in Economic Development- Role of technology in Economic Development- Labour intensive versus Capital intensive technology- Schumacher's concepts of intermediate and appropriate technology- Green Technology- Meaning and Types of Economic Planning- Role of Planning in Economic Development

References:

1. Boldwin, Economic Development: Theory, History and Policy, Willy Publishers, 1957.
2. Mamoria, Joshi, Principles and practice of marketing in India, Kitab Mahal, 1979.
3. Meier, Gerald M. and James E. Rauch. Leading Issues in Economic Development, New Delhi: Oxford Univ. Press, 2006.
4. Thirlwall, A.P. Growth and Development 8e. New York: Palgrave MacMillan, 2005.
5. Todaro, Michael P. and Stephen C. Smith. Economic Development, 8e. Delhi: Pearson Education,

ECONOMICS OF AGRICULTURE AND CO-OPERATION (SEMESTER-V) PAPER NO - VI

COURSE CODE	PAPER TITLE	CREDIT	MARKS
UAR5EC6	ECONOMICS OF AGRICULTURE AND CO-OPERATION	3.5	100

Course Objectives –

This paper provides an overview of the role of agriculture in the economic development of the country and the salient features associated to agricultural productivity and agricultural labour. The pertinent aspects related to agricultural credit, agricultural marketing as well as the global problems existing in the marketing are dealt in. Students can acquire understanding about the features of agricultural policy and the agrarian crisis as well as the problems and challenges in the field of Agriculture and cooperation.

Course Outcomes -

- Students will obtain information regarding various agricultural issues in India and remedies for it.
- Making awareness about self-employment through various local business like agro- tourism, travel agents, horticulture, floriculture, fishery and animal husbandry.

Module 1: Agricultural Productivity (12 Lectures)

Role of agriculture in Economic Development - Cropping pattern in India, Recent trends, Factors affecting - cropping pattern - Physical, Technical and Economic - Agricultural Productivity, Causes of Low Productivity in Agriculture - Measures taken to improve the Agricultural Productivity in India - Irrigation and Water Management and agricultural development - Agricultural labour Problems and suggestions.

Module 2: Agricultural Credit (12 Lectures)

Institutional and Non-Institutional Sources of Credit Co-operative Credit and Agriculture Rural Indebtedness - Commercial Banks and Regional Rural Banks - Microfinance and NABARD - Role and Performance - Crop loan and Crop Insurance, Kisan Credit card Yojana.

Module 3: Agricultural Marketing (12 Lectures)

Types of Marketing - Corporate, Commodity and Global Problems and Measures of Agricultural Marketing - Regulated Market - WTO and Indian Agriculture - Problems of Agricultural Marketing and its measures - National Agricultural Market - FPO – Farmers Producer Organizations.

Module 4: Agricultural Price and Policy (12 Lectures)

Food Security in India - Price Policy of CACP Evaluation - Agricultural Crisis and Farmers Suicide - Agro-Tourism and its policy - Organic Farming - Mechanization of Agriculture.

References:

1. Bilgrami S.A.R. (2000), An Introduction of agricultural Economics, Himalaya Publishing House, Mumbai
2. Datta Ruddra and Mahajan Ashwini (2016), Indian Economy, Chand and Company Ltd., New Delhi.
3. Gupta P. K.,(2012), Agricultural Economics, Vrinda Publications (P) Ltd. Delhi.

4. Mamoria C.B. and B.B. Tripalhi (1991), Agricultural Problems in India, Kitab Mahal, Allahabad.
5. Sadhu and Singh (2008), Fundamental of Agricultural Economics, Himalaya Publishing House, Mumbai.
6. Tyagi B.P., (2016), Agricultural Economics and Rural Development, Jaiprakash Nath and Co. Meerut.

INDUSTRIAL AND LABOUR ECONOMICS (SEMESTER-V) PAPER NO - VI

COURSE CODE	PAPER TITLE	CREDIT	MARKS
UAR5EC6	INDUSTRIAL AND LABOUR ECONOMICS	3.5	100

Course Objectives –

There has been a paradigm shift in the structure of the Indian industrial sector and the policies governing it ever since the new era of globalization and liberalization has ushered in. This paper intends to equip the students with the knowledge about the fundamentals of Industrial Economics and also the latest policies relating to the Indian industry.

Course Outcomes –

- Learners will study the different contemporary issues of industrial sector.
- Learners will know the problems of industries.
- Learners will get the idea about productivity.
- Learners will get with new Policies and its impact on industries.

Module 1: Introduction (12 Lectures)

Meaning and Scope of Industrial Economics- Industrial Profile- Private sector- Performance and Problems - Cooperatives sector and its role, merits and demerits- Public Sector – Role - Performance and Problems -Role of agriculture in Industrial development, Industrial Combinations - Motives for Mergers and Acquisitions.

Module 2: Industrial Location and Problem of Regional Imbalance (12 Lectures)

Determinants of Industrial Location, Theories of Industrial Location - Weber's and Sargent Florence's Theories, Dispersal and Decentralization of Industries, Problem of Regional Imbalance.

Module 3: Industrial Productivity and Industrial Sickness (12 Lectures)

Concept and Measurement of Industrial Productivity- Factors Affecting Industrial Productivity-Industrial Sickness - Causes, Effects and Remedial Measures - Rationalisation - Concept, Aspects and Impact.

Module 4: Industrial Development in India (12 Lectures)

New Industrial Policy, 1991; Disinvestment Policy; Small Scale Industries and Rural Industrialization; National Manufacturing Policy, 2011 - Recent Trends in India's Industrial Growth- Role of MNCs in the Indian Economy - Merits and Demerits, Industrial Finance in India.

References:

1. Barthwal R.R. (2007), Industrial Economics, New Age International Publishers, New Delhi.
2. D. Agrawal A.N. (2011), Indian Economy, New Age International Publishers, New Delhi.
3. Datt R. and Sundaram K.P.M. (2009), Indian Economy, S.Chand & Co., New Delhi.
4. Kuchhal S.C. (1980), Industrial Economy of India, Chaitanya Publishing House, Allahabad.
5. Mishra S.K. and Puri V.K.(2008), Indian Economy, Himalaya Publishing House, Mumbai.

RESEARCH METHODOLOGY (SEMESTER-V) PAPER NO - VII

COURSE CODE	PAPER TITLE	CREDIT	MARKS
UAR5EC7	RESEARCH METHODOLOGY	4	100

Course Objectives –

This paper contains within the various objectives, such as to understand and make aware as well as inculcate research in Economics amongst the learners, to encourage exchange of ideas and application of results of economic research at the same time to enable students in understanding data collection and presentation for quality research in social sciences.

Course Outcomes-

- The learners will understand and inculcate research in Economics
- The learners will exchange ideas and application of results of economic research.
- The course will help in formulation of problems in social science research.
- The students will understand data collection and presentation for quality research in social sciences.

Module 1: Introduction to Research

(12 Lectures)

Meaning and scope of social science research- Basic assumptions of research- Features and importance of social science research- Objectives and types of research; Basic, Applied, Pure, Descriptive, Analytical, and Empirical research- Limitations of social science research- Difficulties in social science research

Module 2: Formulation of Problem in Social Science Research

(12 Lectures)

Research process: Identification, selection and formulation of research problem-Sources of research problem - Criteria of a good research problem- Review of literature-Formulation of hypothesis- Research design: Definition, Concepts, and types- Data Collection and analysis- Interpretation and report writing- Use of web search in research process.

Module 3: Types of Data: Primary and Secondary

(12 Lectures)

Types of Data: Primary data and its collection methods: Observation method- Interview Technique - Design of schedule and questionnaire - Survey method and Field visits - Secondary data : Meaning-advantages- sources- relevance and limitations of secondary data- Sampling Techniques : Census and sample survey- Essentials of a good sampling - Advantages and limitations of sampling- Types of sampling: Random sampling and Non-random sampling-Sampling and Non-Sampling errors.

Module 4: Representation and Analysis of Data

(12 Lectures)

Classification, Tabulation and Graphical presentation of socio-economic data- Need and importance of data analysis- Statistical analytical tools: Measures of Central Tendency - Measures of Variation : Absolute and relative measures - Quartile deviation, standard deviation, coefficient of variation- Skewness: Meaning and measurement (Karl Pearson's and Bowley's methods) - Preliminaries of computer applications in data organization and data processing.

References:

1. Bhandarkar P.L., (1994), Samajik Sanshodhan Padhati, Himalaya Publication, New Delhi.
2. Dawson, Catherine (2002), Practical research methods, UBS Publishers, New Delhi.
3. Ghosh, B.N. (1992), Scientific methods and social research, Sterling Publishers Pvt. Ltd, New Delhi.
4. Gupta S P, (1987), Statistical methods, Sultan Chand and Sons, New Delhi.

5. Kothari R.C. (2008), Research methodology, methods and techniques, New Age International Publishers, New Delhi.
6. Krishnaswamy O.R.(1993), Methodology of research in social sciences, Himalaya publishing House, Mumbai.

ENVIRONMENTAL ECONOMICS (SEMESTER-V) PAPER NO - VIII

COURSE CODE	PAPER TITLE	CREDIT	MARKS
UAR5EC8	ENVIRONMENTAL ECONOMICS	4	100

Course Objectives-

This course introduces the learner to the basic concepts, economic instruments and policy options in managing the environment. The impact of development on environment is suitably addressed under the rubric of sustainable development. Economic implications of environmental policy and valuation of environmental quality are important areas of concern to be covered. The students are sensitized to the role of human decisions in affecting the environmental quality and managing global environmental issues. The causes, effects and measures to control different types of pollution are impressed upon. The environmental accounting practices, policies, impact and risk analysis focusses on India.

Course Outcomes –

- On the completion of this course, the student will have a good understanding of contemporary environmental issues and their relation to economic development.
- The learner will be equipped to understand the methodologies and tools of valuing the environment.
- In the light of international environmental agreements, the learners will be able to understand the global approaches and policies adopted by India to deal with the environmental issues.

Module1: Introduction to Environmental Economics (12 Lectures)

Environmental Economics: Nature, Significance and Scope; Environment and the economy; Environmental Kuznets Curve; Common resources, externalities and property rights; Coase Theorem; Rio Declaration and Agenda 21 programme of action for sustainable development.

Module 2: The Design and Implementation of Environmental Policy (12 Lectures)

Criteria for evaluating environmental policies; Tools of Environmental Policy: Standards, Pigovian taxes/effluent fees, quotas/tradable permits; Choice between taxes and quotas; Environmental Policy: Regulation and Implementation.

Module 3: Measuring Benefits of Environmental Improvements (12 Lectures)

Economic value of Environment: Use and Non-use values; Measurement methods of environmental value: Market based and Non-market based methods; Contingent Valuation Method; Travel Cost Method; Hedonic Price Method.

Module 4: Global Environmental Issues (12 Lectures)

Trade and environment-Overview of trans-boundary environmental problems-Global Warming - Climate Change - Energy Crisis - Challenges of urbanization - International environmental agreements.

References:

1. Barry Field and Martha k Field: Environmental Economics, McGraw Hill International Edition, 2017.
2. Benneer, Lori Snyder, and Cary Coglianesi (2004), Evaluating Environmental Policies, KSG Faculty Research Working Paper Series RWP04-049,USA
3. Charles Kolstad : Environmental Economics, Oxford University Press, New York, 2000.
4. Hanley Nick, Shogren Jason and White Ben: Introduction to Environmental Economics, Oxford University Press, 2001.
5. Mickwitz, Per. (2003). A Framework for Evaluating Environmental Policy Instruments Context and

Key Concepts. Evaluation.

6. Smith Stephen: Environmental Economics: A very Short Introduction, 1st Edition, Oxford University Press, New York, 2011.

HISTORY OF ECONOMIC THOUGHT (SEMESTER-V) PAPER NO - IX

COURSE CODE	PAPER TITLE	CREDIT	MARKS
UAR5EC9	HISTORY OF ECONOMIC THOUGHT	3.5	100

Course Objectives-

The very purpose of this course is to provide information about the biography and contribution of the most influential economists who influenced the economic fraternity and to whom we are obliged to for shaping up the economic thought process.

Course Outcome-

- Students will get information about the genesis of Economics and its modern scenario.
- Establish the co-relation of Economics with other subjects.

Module 1: Classical Economics

(12 Lectures)

Mercantilism and Physiocracy: Introduction -Adam Smith: Liberalism -Division of Labour -Theory of Value - David Ricardo: Rent Theory- Wage Theory - Theory of Value- Karl Marx: Surplus Value Materialistic Interpretation of History -Scientific Socialism.

Module 2: Neo-Classical Economics

(12 Lectures)

Alfred Marshall : Thought on Value - Representative Firm - Consumer's Surplus - Internal and External Economies-Quasi Rent - Schumpeter: Economic Development And Innovation- Pigou :Welfare Economics. **Module 3: Keynesian Ideas**

(12 Lectures)

Employment Theory- Money- Wage Rigidity Model- Multiplier and accelerator and their interaction - Trade Cycle - Inflation -Role of Fiscal Policy - Keynesian Economics and Developing Countries.

Module 4: Post-Keynesian Economics

(12 Lectures)

Supply Side Economics -Hayek's Theory of Trade Cycle- Life Cycle theory Consumption- Friedman: Theory of Demand for Money - Long-Run Philips Curve - Mankiw's New Keynesian Model - Stagflation.

References-

- 1.Dasgupta A. K, Epochs of Economic Theory Oxford University Press. New Delhi, 1985.
2. Ernesto Screpanti and Stefano Zamagni, An Outline Of The History Of Economic Thought, OxfordUniversity Press Inc., New York, 5005.
3. Ghosh and Ghosh: Concise History of Economic Thought, Himalaya Publishers.
4. Gide, O. and G. Rist, A History of Economics Doctrine. George Harrop Co. London. 1956.
5. Harry Landreth and David C. Colander, History of Economic Thought, Houghton Mifflin Company Boston Toronto, 2001.
6. Roll, E., A History of Economics Thought. Faber Landon, 1973.

ADVANCED MACROECONOMICS (SEMESTER-VI) PAPER NO - IV

COURSE CODE	PAPER TITLE	CREDIT	MARKS
UAR6EC4	ADVANCED MACRO ECONOMICS	4	100

Course Objectives –

This course introduces the students to formal modeling of a macro economic theory with analytical tools. Since students have been taught Keynesian Synthesis, this course focuses on four aspects which are the study of Post Keynesian Synthesis, Trade Cycles, Exchange Rate Regimes and International Monetary System.

Course Outcomes –

- To make student aware about Post Keynesian Synthesis and understand various aspects of Trade Cycles.
- Students will be able to describe the contemporary Exchange Rate Regimes and International Monetary System.

Module 1: Post Keynesian Synthesis

(14 Lectures)

Derivation of Aggregate Demand Curve with IS-LM - Aggregate Supply Curve - Determination of Equilibrium National Income and Price Level under Aggregate Demand and Aggregate Supply Model - Extension of IS-LM Model with Labour Market and Flexible Prices - Natural Rate of Unemployment Long run Philips Curve - Friedman's Expectation Model - Tobin's Modified Philips Curve - Adaptive Expectations and Rational Expectations.

Module 2: Trade Cycles

(12 Lectures)

Meaning- Nature- Features and Types of Trade Cycles - Phases of Trade Cycles - Theories of Trade Cycles- Hawtrey's, Kaldor, Paul Samuelson and Hicks - Measures to Control Trade Cycles.

Module 3: Exchange Rate Regimes and Currency Crises

(12 Lectures)

Managed Exchange Rate- Advantage and Disadvantage - Policy of Managed Flexibility-Adjustable Peg System, Crawling Peg System, Managed Floating System, Clean and Dirty Float System - Balance of Payment and Exchange Rate - Is Balance of Payments Always in Balance? – Convertibility of Currency - Currency Crisis-Causes, Impact and Measures.

Module 4: International Monetary System

(12 Lectures)

Rise and Fall of International Gold Standard - Bretton Woods System- Breakdown of the Bretton Woods System - Monetary System after the Collapse of Bretton Woods System - Maastricht Treaty, Features, Effects and Importance of Euro- Currency Market - Causes and Consequences of Global Economic Crisis - Impact of Global Recession on the Indian Economy - Asia Infrastructure Investment Bank (AIIB) - New Development Bank (NDB): Asian Development Bank (ADB).

References:

1. Blanchard, Oliver (2008), Macroeconomics, Pearson education, New Delhi, India.
2. Dornbusch, Fisher and Startz (2018): Macroeconomics, McGraw Hill Education (India) Pvt. Ltd.
3. Mankiw N Gregory (2003), Macroeconomics, 6" edition, Worth Publishers, New York.
4. Patil J. F (2005, Marathi Edition), Macroeconomic Analysis, Phadke Prakashan, Kolhapur.
5. Rana K. C. & Verma K.N (2017), International Economics, Vishal Publishing CO. Jalandhar.
6. Salvatore D. (1997), International Economics, Printice Hall, New York.

INTERNATIONAL ECONOMICS (SEMESTER-VI) PAPER NO - V

COURSE CODE	PAPER TITLE	CREDIT	MARKS
UAR6EC5	INTERNATIONAL ECONOMICS	4	100

Course Objectives-

The course is designed to provide a general understanding of the fundamentals of International Trade Theories along with the balance of payment concepts, crisis and various policy measures to correct the same. It also provides overview of the working of foreign exchange market, determination of exchange rate and different terms related with the foreign exchange market. The course introduces the main features of the international economic institutions and enables them to critically understand role and functions of those institutions.

Course Outcomes-

- Students will be able to understand the trade theories and determinants of trade which helps them to analyze the international trade policies.
- Students will be able to understand the role of various international institutions and trade blocks and their approaches in framing the policies for trade.

Module 1: Introduction to Trade Theories

(12 Lectures)

Meaning, scope and importance of International Trade- Difference between Internal and International Trade - Adam Smith's Theory of International Trade - Ricardian theory of comparative cost difference Heckscher- Ohlin Theory-Leontief's Paradox- Krugman's Model

Module 2: Balance of Trade and Balance of Payment

(12 Lectures)

Concepts of Terms of Trade(Net barter, Gross barter and Income terms of trade)-Meaning and difference between Balance of Trade (BOT) and Balance of Payment (BOP)-Purchasing Power Parity theory, Law of Reciprocal Demand-Marshall-Edgeworth Offer curves, Gains from trade-Case for and against Free Trade and Protection policy

Module 3: Foreign Exchange Market

(12 Lectures)

Meaning and Functions of Foreign Exchange Market-Exchange rate determination, Factors influencing foreign exchange rate-Managed Flexibility-SWAP Market, Components of foreign exchange reserves Foreign Aid Vs Foreign Trade, FDI and MNCs

Module 4: International Economic Institutions and Economic Integration

(12 Lectures)

IMF, World Bank - Role and functions-WTO-Objectives, Functions and Agreements with respect to TRIPS,TRIMS, GATS, AoA - Forms and objectives of Economic Integration-Cartels-Trade Blocs, ASEAN- European Union (EU)- NAFTA and SAARC.

References -

1. Appleyard Dennis and Alfred j Field, Jr, International Economics, 2001, 4th Edition, Tata McGraw-Hill Education Private Limited.
2. Cherunilam Francis, International Economics, 2009, 5th Edition, Tata McGraw-Hill Education Private Limited, New Delhi.
3. Krugman R Paul, Maurice Obstfeld, International Economics Theory and Policy, 2009, 8th Edition, Pearson.
4. Melitz M. and Trefler D., Gains from Trade When Firms Matter, Journal of Economic Perspectives,

Spring 2012.

5. Salvatore, Dominick, International Economics, 2008, 8th Edition, Wiley India.

6. Sodersten, Bo and Geoffery Reed, International Economics, 2006, 3rd Edition.

ECONOMICS OF AGRICULTURE AND CO-OPERATION (SEMESTER-VI) PAPER NO - VI

COURSE CODE	PAPER TITLE	CREDIT	MARKS
UAR6EC6	ECONOMICS OF AGRICULTURE AND CO-OPERATION	3.5	100

Course Objectives –

The paper is designed to provide various aspects related to the Principles of cooperation and cooperative organizations in the globalized economy. The essentials of cooperative finance are dealt in with reference to the latest trends. The cooperative movement has a long history of more than hundred years. Indian Cooperatives Structure is one of the largest networks in the world. Under this backdrop the student should study the principles and role of cooperation in the modern era.

Course Outcomes –

- Students can understand the basic Principles of Cooperation, Globalization and Cooperation.
- Provides information about co-operative Movement in India and its performance and role in rural development.
- Students get introduced to the problems and measures of agro industries and Cooperative farming and Leadership in cooperative development.

Module 1: Co-operation

(12 Lectures)

Meaning and features of Co-operation- Principles of Co-operation (Manchester-1995) - Role of Co-operation in Economic development - Globalization and Co-operation-Importance and Benefits of Co-operation - Co-operative Movement in foreign Countries - Consumer Cooperative Movement in U.K.Agricultural Cooperative Movement in Israel.

Module 2: Co-operative Finance in India

(12 Lectures)

Co-Operative Finance: Need, Structure. Progress and Problems - National Co-operative Development Corporation (NCDC) - Farmers service societies - Urban Co-operative banks.

Module 3: Agricultural Co-operatives

(12 Lectures)

Role and Types of Agro-Industries - Problems and Measures of Agro-Industries - Sugar and Dairy Co-operatives - Food and Fruits Processing Industry - Co-Operative Farming.

Module 4: Co-operative Organizations in India

(12 Lectures)

Consumer Co-operatives - Co-operative Marketing - NAFED - Housing Co-operative societies Labour Co-operative societies - Leadership in Cooperative development - Concept of Co-Operatives Audit.

References-

1. Bedi R. D. (2001), Theory, History and Practice of Co-Operation, International Publishing House, Meerut (U.P.).
2. Government of Maharashtra - Co-operative movement at a Glance (latest annual report).
3. Hajela T.N, (2000), principles, problem and practice of Co-operation, Agarwal Publication, New Delhi.
4. Mathur B. S, (2000), Co-Operation in India, Sahitya Bhavan, Agra.
5. Matthai John, (1996), Agricultural Co-Operation in India, Reliance Publishing House, New Delhi.

6. Swami Krishna, (1985), Fundamentals of Co-Operation, S. Chand and Company Ltd, New Delhi.

INDUSTRIAL AND LABOUR ECONOMICS (SEMESTER-VI) PAPER NO - VI

COURSE CODE	PAPER TITLE	CREDIT	MARKS
UAR6EC6	INDUSTRIAL AND LABOUR ECONOMICS	3.5	100

Course Objectives –

Issues pertaining to the labour market, wage policy, trade unions and amicable solutions to industrial disputes have become vital for developing countries, especially for India, where the bulk of the labourforce is employed in the unorganised sector, and the organized sector is witnessing a phenomenon of 'jobless' growth. This paper intends to provide knowledge of the same and also discusses the importance of labour welfare and social security measures for the growing labour force in India.

Course outcomes-

- Learners become aware about different problems and policies a labour.
- Learners will get intoned about trade unions and industrial relation in contemporary world.
- Learned will know the different policies of labour welfare.

Module 1: Introduction - Indian Labour Market (12 Lectures)

Characteristics of the Indian Labour Market, Child Labour and Women Labour -Problems and Measures, Labour Market Reforms - Exit Policy and Need for Safety Nets, Second National Commission on Labour, Globalization and its impact on Indian Labours.

Module 2: Trade Unionism (12 Lectures)

Definition and Functions of Trade Unions, Historical Evolution of Trade Unions in India and their Present Status- Problems of Trade Unions in India- Role of Outside Leadership- International Labour Organization.

Module 3: Industrial Relations (12 Lectures)

Causes of Industrial Disputes and Their Settlement Mechanism- Collective Bargaining - Concept, Features - Importance and Pre-requisites for Successful Collective Bargaining - Collective Bargaining in India -Workers' Participation in Management- Concept, Objectives and Forms of Workers'Participation in India -Working Conditions and life style of Indian workers.

Module 4: Labour Welfare and Social Security (12 Lectures)

Concept -Theories and Principles of Labour Welfare- Agencies for Labour Welfare, Role of the Labour Welfare Officer - Social Security-Concept; Social Assistance and Social Insurance – Social Security Measures in India - Indian Labour Legislations.

References-

1. Agrawal A.N. (2011), Indian Economy, New Age International Publishers, New Delhi.
2. CO Monappa A, (2006), Industrial Relations, Tata McGraw Hill Publishing Company Ltd, New Delhi.
3. Datt R. and Sundaram K.P.M. (2009), Indian Economy, S.Chand & Co., New Delhi.
4. Mamoria C.B. and Mamoria S. (2002), Dynamics of Industrial Relations, Himalaya Publishing House, Mumbai.

5. U. Mishra S.K. and Puri V.K.(2008), Indian Economy, Himalaya Publishing House, Mumbai.
6. U. Ratna Sen, Industrial Relations in India - Shifting Paradigms (2005), Macmillan, New Delhi.

RESEARCH METHODOLOGY (SEMESTER-VI) PAPER NO - VII

COURSE CODE	PAPER TITLE	CREDIT	MARKS
UAR6EC7	RESEARCH METHODOLOGY	4	100

Course Objectives-

This paper 'Research methodology-II' has various objectives, like to enable students in understanding application of statistics in research, to prepare learners to realize about various analytical tools and methods in research, to orient the students to know index numbers, hypothesis formulations and testing and to make student understand about the research report writing.

Course Outcomes-

- The learners get assimilated to the research culture in Economics through application of statistics.
- The learners will understand the concept of index number with its use and applications.
- The course will help in formulation of hypotheses and its testing in social science research.
- The students will understand the writing of social science research reports with its various types, organization and styles.

Module 1: Application of Statistics in Research (10 Lectures)

Methods of studying correlation- measurement of simple correlation: graphic method- Scatter diagram Coefficient of correlation- Karl Pearson and rank correlation- Interpretation of $r = +1$. Linear regression analysis: Meaning, regression lines, regression equation, regression equation relationship between correlation and regression- Analysis of time series- Components- Trend analysis- Moving averages (3, 4 and 5 Yearly)- Method of least square.

Module 2: Index Number: (14 Lectures)

Meaning and classification of index number - Problems encountered while constructing index numbers Uses and limitation of index numbers - Methods of constructing index numbers: Simple index: i) Aggregate method ii) Simple average of Relative method - Weighted index: Laspeyres's, Paache's, Fisher's and Marshall- Edgeworth - Base shifting - Deflating and Cost of living index number: Weighted average of Relative method - Aggregate Expenditure method- Chain based index - Concepts of base shifting, splicing, and deflating - Consumer price index- Meaning, need and construction.

Module 3: Hypothesis Formulation and Testing (10 Lectures)

Definition and functions of Hypothesis - Criteria of workable Hypothesis - Forms and sources of hypothesis- Concepts in testing of hypothesis: Universe / Population parameter and sample statistics Types of hypotheses: Null and Alternative Hypotheses-Levels of significance-Critical region - Type I and Type II Errors -Student t- test.

Module 4: Research Report Writing (14 Lectures)

Types of research reports: Technical, Popular, Interim, Summary, Article- Format of a research report Principles of writing the research report: Organization and style - Contents- Styles of reporting- Steps in drafting reports- Editing the final draft-Evaluating the final draft -Organization of the research report: Preliminaries, Contents of report, Structuring the report: Chapter format- Pagination- Identification Using quotations, Presenting footnotes- Abbreviations- Presentation of tables and figures- Referencing documentation-Use and format of appendices- Indexing - Bibliography, Appendices.

References-

1. Allen, T. Harrell (1978), New methods in social science research, Praeges Publishes, New York
2. Bhandarkar P.L.,(1994), Samajik Sanshodhan Padhati, Himalaya Publication, New Delhi, (Marathi)
3. Ghosh, B.N, (1992). Scientific methods and social research, Sterling publishers Pvt. Ltd, New Delhi.
4. Gupta S. P, (1987), Statistical methods, Sultan Chand and Sons, New Delhi
5. Kothari R.C. (2008), Research methodology, methods and techniques, New Age International

Publishers, 2nd revised edition, New Delhi.

6. Krishnaswamy O.R. (1993), Methodology of research in social sciences, Himalaya Publishing House, Mumbai

ENVIRONMENTAL ECONOMICS (SEMESTER-VI) PAPER NO - VIII

COURSE CODE	PAPER TITLE	CREDIT	MARKS
UAR6EC8	ENVIRONMENTAL ECONOMICS	4	100

Course Objectives –

This paper introduces vital aspects related to environmental degradation and advocates the need for environmental accounting. The paper also focuses on the attainment of SDGs

Course Outcomes –

- Students are empowered about the environmental challenges and the need for environmental accounting
- Develop understanding on the policy measures to attain SDGs

Module 1: Environmental Degradation (12 Lectures)

Concept and types of Environmental Degradation; Renewable and Non-renewable natural resources: Land, Air, Water and Noise Pollution: Causes, effects and measures.

Module 2: Environmental Accounting (12 Lectures)

Accounting for environmental and natural resources: Meaning and importance; System of Environmental-Economic Accounting (SEEA) and Environmental and Natural Resources Accounting (ENRA); Integration of Environmental Accounts with System of National Accounts: Green GDP; Concept of Green Growth and its Indicators; Concepts of Green Consumer and Green Business.

Module 3: Sustainable Development and India (12 Lectures)

Concept of Sustainable Development; Characteristics and dimensions of Sustainable Development; Sustainable Development Goals and Measures with special reference to India; Smart Cities Mission in India; National Mission For Sustainable Agriculture (NMSA): Objectives, strategy and components.

Module 4: Environmental Policy in India (12 Lectures)

Overview of laws to improve the environment in India; Central pollution Control Board; Industrial Pollution Control Measures in India; Pradhan Mantri Ujjwala Yojana (PMUY); National Green Tribunal.; Environmental Education in India.

References-

1. Barry Field and Martha k Field: Environmental Economics, McGraw Hill International Edition, 2017.
2. Bhattacharya R.N. (Ed) (2001), Environmental Economics: An Indian Perspective, Oxford University Press, New Delhi.
3. Charles Kolstad : Environmental Economics, Oxford University Press, New York, 2000.
4. Hanley Nick, Shogren Jason and White Ben: Introduction to Environmental Economics, Oxford University Press, 2001.
5. Kaltschmitt, Martin, Streicher, Wolfgang, Wiese, Andreas, Renewable Energy: Technology, Economics and Environment, Springer, Germany, 2007.
6. V.S. Ganesamurthy: Environmental Economics in India, New Century Publications, New Delhi, 2009.

HISTORY OF ECONOMIC THOUGHT (SEMESTER-VI) PAPER NO - VIII

COURSE CODE	PAPER TITLE	CREDIT	MARKS
UAR6EC9	HISTORY OF ECONOMIC THOUGHT	3.5	100

Course Objectives –

This paper aims to provide the information about the biography and contribution of various economic thinkers. This paper is framed with the objective of making students aware of the varying phases of economic thoughts and development of that into economic science.

Course Outcome-

- Students will get information about the genesis of Economics and its modern scenario.
- Students get familiarized with the leading Indian economists who significantly contributed to the stream of Indian economic thought.

Module 1: Indian Economic Thought

(12 Lectures)

Kautilya on welfare state -Dadabhai Naoroji's Thoughts on Drain Theory- Ranade's Case on Protection - R. C. Dutt on Imperialism - Land Tax and Public Finance - Gopal Ganesh Agarkar.

Module 2: Economic Thought of Mahatma Phule and Gandhi (12 Lectures)

Mahatma Phule's Views on Agriculture - Reasons of Farmer's Poverty - Gandhian Economic Thoughts on Self-Sufficient Village Economy - Dignity of Labour – Trusteeship - and Sarvodaya.

Module 3: Economic Thought of Dr. B.R.Ambedkar, G.K.Gokhale and Dr. Manmohan Singh (12 Lectures)

Dr.Ambedkar's Case for State Socialism - Problem of Rupee - Public Finance – G.K.Gokhale on Development and Welfare - Dr. Manmohan Singh's ' Three Steps' to Stem India's Economic Crisis.

Module 4: Nodel Prize Winners in Economics (12 Lectures)

Dr. Amartya Sen (1998) -Robert. A. Mundell (1999) -Joseph Stiglitz(2001) -Dr. Abhijeet Banarjee (2019)

References:

1. B.R.Nanda Gokhale (1977):- The indian moderates and the British raj, Delhi.
2. Ajit K.Dasgupta,A History of Indian Economic Thought, (1993)Routledge London and New York.
3. Bipin Chandra (ed) (1999) Rande's economic writings, Gyan Publication House, New Delhi.
4. Encyclopaedia of Nobel Laureate, Ed's, (2002) R. Kapila & A. Kapila, Academic Foundation.
5. Gandhi. M. K., (1959), India of my dreams, Navjivan publishing house Ahmadabad.
6. R. P. Mansi, Dadabhai Naoroji, (1960) publication Division, Government of India Delhi.

॥ विद्या विनयेन शोभते ॥

Janardan Bhagat Shikshan Prasarak Sanstha's

Changu Kana Thakur

**Arts, Commerce and Science College, New Panvel
Autonomous**



**Scheme of Evaluation for
Continuous Assessments and Semester
End Examinations
for
Under-graduate
Programmes
under
Faculty of Arts
Subject: Hindi**

***Under Autonomous status with Credit
Based Semester and Grading System***

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DEPARTMENT OF HINDI

Bachelor of Arts (B.A.) Revised Syllabus For

T.Y.B.A. – Hindi- Paper No – IV, V, VI, VII, VIII, and IX

Choice Based Credit Grading and Semester System (CBCGS)

(75:25)

With effect from the Academic Year 2021-2022

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Janardan Bhagat Shikshan Prasarak Sanstha's

चांगू काना ठाकूर कला, वाणिज्य और विज्ञान महाविद्यालय, (स्वायत्त)
नवीन पनवेल.



हिन्दी-विभाग

बी. ए. स्नातक हिन्दी

पाठ्यक्रम

शैक्षणिक वर्ष-2021-2022

हिन्दी अध्ययन मण्डल

अनु. क्र	अध्यापक का नाम	पद	अधिष्ठान
१.	डॉ . भंडारे उद्धव तुकाराम	अध्यक्ष, हिन्दी विभाग	अध्यक्ष
२.	डॉ . सौ . जी. एस. तँवर	सहयोगी प्राध्यापक	सदस्य
३.	डॉ . बिसेन जोगेन्द्रसिंग मोतीसिंग	प्रोफेसर	सदस्य
४.	डॉ . हुबनाथ गोरखनाथ पाण्डेय	सहयोगी प्राध्यापक	सदस्य
५.	डॉ . घरत अर्जुन जानू	पूर्व प्रोफेसर	सदस्य
६.	डॉ . विजयप्रसाद के . अवस्थी	सहयोगी प्राध्यापक	सदस्य
७.	श्री . विमल कुमार मिश्र	नवभारत टाइम्स, मुंबई	सदस्य
८.	प्रा . महेश श्रीराम गोडबोले	पूर्व स्नातकोत्तर छात्र	सदस्य
९.	डॉ . अमित कुमार प्रेमनाथ मिश्रा	पीएच. डी . छात्र	सदस्य

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Janardan Bhagat Shikshan Prasarak Sanstha's
CHANGU KANA THAKUR
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(AUTONOMOUS)

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Re-accredited 'A+' Grade by NAAC
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'Best College Award' by University of Mumbai

Choice Based Credit Grading and Semester System (CBCGS) (75:25)
With effect from the Academic Year 2021-22

Faculty of Humanities

Semester V & Semester VI

Guidelines

Syllabus Structure:

1. In T.Y.B.A. Hindi Paper IV (CBCGS) in Semester V and Semester VI, there will be one paper each with 4 Credits in each Semester.
2. In T.Y.B.A. Hindi Paper V (CBCGS) in Semester V and Semester VI, there will be one paper each with 4 Credits in each Semester.
3. In T.Y.B.A. Hindi Paper VI (CBCGS) in Semester V and Semester VI, there will be one paper each with 4 Credits in each Semester.
4. In T.Y.B.A. Hindi Paper VII (CBCGS) in Semester V and Semester VI, there will be one paper each with 4 Credits in each Semester.
5. In T.Y.B.A. Hindi Paper VIII (CBCGS) in Semester V and Semester VI, there will be one paper each with 4 Credits in each Semester.
6. In T.Y.B.A. Hindi Paper IX (CBCGS) in Semester V and Semester VI, there will be one paper each with 4 Credits in each Semester.

Scheme of Examination (Under-graduate Programmes)

Credit Based Evaluation System

❖ Scheme of Examination

The performance of the learners shall be evaluated into two components. The learner's Performance shall be assessed by Internal Assessment with 25% marks in the first component by conducting the Semester End Examinations with 75% marks in the second component. The allocation of marks for the Internal Assessment and Semester End Examinations are as shown below:-

A) Internal Assessment: 25 % **25 Marks** *(For Courses without Practical)*

Sr. No.	Particular	Marks
01	One periodical class test / online examination to be conducted in the given semester	20 Marks
02	Active participation in routine class instructional deliveries and overall conduct as a responsible learner, mannerism and articulation and exhibit of leadership qualities in organizing related academic activities	05 Marks

Question Paper Pattern

(Periodical Class Test for the Courses at Under Graduate Programmes)

Maximum Marks: 20

Questions to be set: 02

Duration: 40 Minutes

All Questions are Compulsory

Question No	Particular	Marks
Q-1	Match the Column / Fill in the Blanks / Multiple Choice Questions/ Answer in One or Two Lines (Concept based Questions) (1 Marks / 2 Marks each)	10 Marks
Q-2	Answer in Brief (Attempt any Two of the Three) (5 Marks each)	10 Marks

B) Semester End Examination: 75 %**75 Marks**

- Duration: The examination shall be of $2\frac{1}{2}$ hours duration.

Question Paper Pattern**Theory question paper pattern**

1. There shall be five questions each of 15 marks.
2. All questions shall be compulsory with internal options.
3. Question may be subdivided into sub-questions a, b, and the allocation of marks depends on the weightage of the unit.

❖ Passing Standard

The learners to pass a course shall have to obtain a minimum of 40% marks in aggregate for each course where the course consists of Internal Assessment and Semester End Examination. The learners shall obtain minimum of 40% marks (i.e. 10 out of 25) in the Internal Assessment and 40% marks in Semester End Examination (i.e. 30 Out of 75) separately, to pass the course and minimum of Grade D, wherever applicable, to pass a particular semester. A learner will be said to have passed the course if the learner passes the Internal Assessment and Semester End Examination together.

Note: All other rules regarding Standard of Passing, ATKT, etc, will be as per those decided by the Faculty of Humanities passed by the Academic Council from time to time

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**ARTS, COMMERCE & SCIENCE COLLEGE, NEW PANVEL
(AUTONOMOUS)**

Affiliated to University of Mumbai

शैक्षणिक वर्ष-2021-2022

CONTENT

Programme - Bachelor of Arts (B.A.)

Semester V

Sr.No	Class	Course Name of the Paper	Paper No.	Paper Code	Credits
1.	T.Y.B.A.	हिन्दी साहित्य का इतिहास	IV	UAR5HN4	04
2.	T.Y.B.A.	स्वातंत्र्योत्तर हिन्दी साहित्य	V	UAR5HN5	04
3.	T.Y.B.A.	हिन्दी में सूचना प्रौद्योगिकी	VI	UAR5HN6	04
4.	T.Y.B.A.	साहित्य समीक्षा : छंद एवं अलंकार	VII	UAR5HN7	04
5.	T.Y.B.A.	भाषा विज्ञान : हिन्दी भाषा और व्याकरण	VIII	UAR5HN8	04
6.	T.Y.B.A.	जनसंचार माध्यम	IX	UAR5HN9	04

Semester VI

Sr.No	Class	Course Name of the Paper	Paper No.	Paper Code	Credits
1.	T.Y.B.A.	आधुनिक हिन्दी साहित्य का इतिहास	IV	UAR6HN4	04
2.	T.Y.B.A.	स्वातंत्र्योत्तर हिन्दी साहित्य	V	UAR6HN5	04
3.	T.Y.B.A.	सोशल मीडिया	VI	UAR6HN6	04
4.	T.Y.B.A.	साहित्य समीक्षा : छंद एवं अलंकार	VII	UAR6HN7	04
5.	T.Y.B.A.	भाषा विज्ञान : हिन्दी भाषा और व्याकरण	VIII	UAR6HN8	04
6.	T.Y.B.A.	जनसंचार माध्यम	IX	UAR6HN9	04

पाठ्यक्रम की प्रस्तावना :
हिन्दी में कला स्नातक (बी. ए. हिन्दी)

पाठ्यक्रम के उद्देश्य :

1. साहित्यिक कृतियों के पाठन एवं आस्वादन हेतु विद्यार्थियों में रुचि विकसित करना।
2. साहित्य के माध्यम से देश की सामाजिक, आर्थिक और राजनीतिक स्थिति से विद्यार्थियों को अवगत कराना।
3. साहित्य के माध्यम से समाज की स्थिति को स्पष्ट करना।
4. साहित्य के माध्यम से भारतीय संस्कृति की जानकारी देना।
5. साहित्य के पठन-पाठन से दो भाषाओं के मध्य की खाई को पाटना।
6. साहित्य के माध्यम से समाज या दो भाषाओं के मध्य सांस्कृतिक आदान-प्रदान से प्रेम तथा सद्भाव लाना।
7. विद्यार्थियों में भाषिक कौशल्य का विकास करना।
8. विद्यार्थियों में व्याकरणिक कौशल्य का विकास करना।
9. विद्यार्थियों में रिपोर्ट लेखन के कौशल्य का विकास करना।

पाठ्यक्रम का परिणाम :

1. पाठ्यक्रम की समाप्ति पर विद्यार्थियों में अग्रलिखित योग्यता विकसित हो जानी चाहिए।
2. हिन्दी की विभिन्न विधाओं के बारे में सुसंगत और प्रभावी समझ निर्माण होनी आवश्यक है।

3. हिन्दी के क्षेत्र में विद्यार्थियों की समझ और रुचि विकसित होनी चाहिए।
4. व्यावहारिक हिन्दी और व्यावसायिक अनुप्रयोग में बुनियादी कौशल विकसित करना।
5. पाठ्यक्रम के माध्यम से विद्यार्थियों में सामाजिक, राजनीतिक, धार्मिक, सांस्कृतिक, विश्वदृष्टि का विकास होगा।
6. विद्यार्थियों में रसास्वाद के कौशल का विकास होगा।
7. हिन्दी हेतु उपलब्ध रोजगारों के लिए आवश्यक गुणों का विकास होगा तथा ज्ञानात्मक आधार पुष्ट होगा।

॥ विद्या विनयेन शोभते ॥
Janardan Bhagat Shikshan Prasarak Sanstha's
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ARTS, COMMERCE & SCIENCE COLLEGE, NEW PANVEL
(AUTONOMOUS)

Affiliated to University of Mumbai



Syllabus

Question Paper Pattern (75:25)

Choice Based Credit Grading and Semester System (CBCGS)
With effect from the Academic Year 2021-22

Semester V

Program T.Y.B.A.

Course: Hindi

हिन्दी साहित्य का इतिहास-IV

शैक्षणिक उद्देश्य :

1. हिन्दी साहित्य के इतिहास एवं काल विभाजन से विद्यार्थियों को अवगत कराना।
2. हिन्दी साहित्य के विभिन्न कालों की परिस्थितियों एवं प्रवृत्तियों से विद्यार्थियों को अवगत कराना।
3. हिन्दी के पद्य एवं गद्य साहित्य के क्रमिक विकास को स्पष्ट करना।
4. आधुनिक साहित्य की समझ एवं समीक्षा का विकास।

परिणाम :

1. पाठ्यक्रम के माध्यम से विद्यार्थियों में सामाजिक, राजनीतिक, धार्मिक एवं सांस्कृतिक विश्वदृष्टि का विकास होगा।
2. विद्यार्थियों में रसास्वादन के कौशल्य का विकास होगा।
3. हिन्दी हेतु उपलब्ध रोजगारों के लिए आवश्यक गुणों का विकास होगा।
4. ज्ञानात्मक आधार पुष्ट होगा।

अध्ययन पद्धति :

1. व्याख्यान तथा विश्लेषण।
2. संगोष्ठी, स्वाध्याय तथा समूह चर्चा।
3. पावर पॉइंट प्रेजेंटेशन, यू ट्यूब वीडियो आदि साधनों का उपयोग।
4. अतिथि विषय विशेषज्ञों के व्याख्यान।

Semester- V
T.Y.B.A. Paper No- IV
हिन्दी साहित्य का इतिहास

Name of the Programme	: B.A.
Name of the Course	: हिन्दी साहित्य का इतिहास
Course Code	: UAR5HN4
Total Lectures	: 60
Total credit	: 04

पाठ्यक्रम

इकाई I

-05

१. हिन्दी साहित्य का इतिहास -
 1. नामकरण
 2. कालविभाजन
 3. समस्याएँ ।

इकाई II आदिकाल

-20

1. आदिकालीन हिन्दी साहित्य की परिस्थितियाँ -
 1. राजनीतिक
 2. धार्मिक
 3. सामाजिक
 4. साहित्यिक
 5. सांस्कृतिक
2. आदिकालीन हिन्दी साहित्य का सामान्य परिचय एवं विशेषताएँ-
 1. सिद्ध साहित्य
 2. नाथ साहित्य
 3. जैन साहित्य
 4. रासो साहित्य
 5. वीरगाथा

इकाई III भक्तिकाल

-20

1. भक्तिकालीन हिन्दी साहित्य की परिस्थितियाँ –
 1. राजनीतिक
 2. धार्मिक
 3. सामाजिक
 4. साहित्यिक
 5. सांस्कृतिक
2. भक्तिकालीन हिन्दी साहित्य का सामान्य परिचय एवं विशेषताएँ
 1. संत काव्य धारा
 2. सूफी काव्य धारा
 3. राम काव्य धारा
 4. कृष्ण काव्य धारा

इकाई IV रीतिकाल

-15

1. रीतिकालीन हिन्दी साहित्य की परिस्थितियाँ –
 1. राजनीतिक
 2. धार्मिक
 3. सामाजिक
 4. साहित्यिक
 5. सांस्कृतिक
2. रीतिकालीन हिन्दी साहित्य का सामान्य परिचय एवं विशेषताएँ-
 1. रीतिबद्ध काव्य
 2. रीतिसिद्ध काव्य
 3. रीतिमुक्त काव्य

संदर्भ ग्रंथ

1. हिन्दी साहित्य का इतिहास – आचार्य रामचन्द्र शुक्ल
2. हिन्दी साहित्य की पृष्ठभूमि – आचार्य हज़ारिप्रसाद द्विवेदी
3. हिन्दी साहित्य का आदिकाल - आचार्य हज़ारिप्रसाद द्विवेदी
4. हिन्दी साहित्य का उद्भव और विकास - आचार्य हज़ारिप्रसाद द्विवेदी
5. हिन्दी साहित्य का आलोचनात्मक इतिहास – रामकुमार वर्मा
6. हिन्दी साहित्य का वैज्ञानिक इतिहास – डॉ . गणपतिचंद्र गुप्त
7. हिन्दी साहित्य का इतिहास – डॉ . विजयेद्र स्नातक
8. हिन्दी साहित्य का इतिहास – डॉ . भंडारे उद्धव तुकाराम
9. निबंधमाला हिन्दी निबंध –डॉ . भंडारे उद्धव तुकाराम
10. हिन्दी साहित्य का दूसरा इतिहास – डॉ . बच्चन सिंह
11. हिन्दी साहित्य (तीन खंड) – संपादक – डॉ . नगेन्द्र और हरदयाल
12. हिन्दी साहित्य का संक्षिप्त इतिहास – लक्ष्मी सागर

Semester- VI
T.Y.B.A. Paper No- IV

आधुनिक हिन्दी साहित्य का इतिहास

Name of the Programme	: B.A.
Name of the Course	: आधुनिक हिन्दी साहित्य का इतिहास
Course Code	: UAR6HN4
Total Lectures	: 60
Total credit	: 04

पाठ्यक्रम

इकाई I आधुनिक हिन्दी कविता का विकास -20

1. आधुनिक हिन्दी साहित्य की परिस्थितियाँ –
 1. राजनीतिक
 2. धार्मिक
 3. सामाजिक
 4. साहित्यिक
 5. सांस्कृतिक
2. आधुनिक हिन्दी कविता का सामान्य परिचय एवं विशेषताएँ
 1. भारतेन्दु-युग
 2. द्विवेदी-युग
 3. छायावाद
 4. प्रगतिवाद

इकाई II -20

१.
 1. प्रयोगवाद
 2. नई कविता
 3. समकालीन कविता
 4. भूमंडलीकरण के बाद की कविता

- इकाई III आधुनिक हिन्दी गद्य का विकास -10
1. 1. आधुनिक गद्य का उद्भव और विकास
2. उपन्यास
3. कहानी
4. नाटक
- इकाई IV -10
१. 1. निबंध
2. आलोचना
3. आत्मकथा

संदर्भ ग्रंथ

1. आधुनिक हिन्दी साहित्य का इतिहास – डॉ . बच्चन सिंह
2. स्वातंत्र्योत्तर हिन्दी साहित्य का इतिहास – डॉ . लक्ष्मीनारायण
3. हिन्दी का गद्य साहित्य – डॉ . रामचन्द्र तिवारी
4. छायावाद – डॉ . नामवर सिंह
5. आधुनिक हिन्दी काव्य की प्रवृत्तियाँ - डॉ . नामवर सिंह
6. भारतेन्दु हरिश्चंद्र – डॉ . रामविलास शर्मा
7. भारतेन्दु युग और हिन्दी भाषा की विकास परंपरा - डॉ . रामविलास शर्मा
8. आचार्य महावीर प्रसाद द्विवेदी और हिन्दी नवजागरण - डॉ . रामविलास शर्मा
9. प्रेमचंद और उनका युग - डॉ . रामविलास शर्मा
10. कहानी नई कहानी – डॉ . नामवर सिंह
11. नई कहानी संवेदना और शिल्प – देवीशंकर अवस्थी
12. हिन्दी नाटक – डॉ . बच्चन सिंह
13. हिन्दी साहित्य का इतिहास – डॉ . भंडारे उद्धव तुकाराम
14. निबंधमाला हिन्दी निबंध –डॉ . भंडारे उद्धव तुकाराम
15. नटरंग – डॉ . नेमिचन्द्र जैन
16. नया साहित्य नए प्रश्न – आचार्य नन्ददुलारे वाजपेयी
17. नई कविता के प्रतिमान – लक्ष्मीनारायण वर्मा
18. कविता के नए प्रतिमान – डॉ . नामवर सिंह
19. जगदीश गुप्त हिन्दी गद्य विन्यास और विकास – रामस्वरूप चतुर्वेदी
20. आधुनिक साहित्य - आचार्य नन्ददुलारे वाजपेयी
21. हिन्दी साहित्य (तीन खंड) – संपादक – डॉ . नगेन्द्र और हरदयाल

प्रश्नपत्र प्रारूप
पेपर नंबर -IV
(Semester –V & VI)

		कुल अंक 75
		समय : 2:30 घंटे
प्रश्न-1	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- I से)	15
प्रश्न-2	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- II से)	15
प्रश्न-3	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- III से)	15
प्रश्न-4	टिप्पणी (आंतरिक विकल्प सहित –इकाई- IV से)	15
प्रश्न-5	क) वस्तुनिष्ठ प्रश्न	10
	ख) बहुविकल्पी प्रश्न	05

आंतरिक परीक्षण

		कुल अंक-25
क	एक कक्ष परीक्षा	20
ख	सक्रिय सहभागिता, नेतृत्व कुशलता, शिष्टाचार तथा समग्र आचरण	05
क	<u>एक कक्ष परीक्षा :-</u>	
प्रश्न-1	सही जोड़ियाँ / रिक्त स्थान / बहुविकल्पीय प्रश्न	05
प्रश्न-2	अतिलघुत्तरी / एक पंक्ति में उत्तर	05
प्रश्न-3	लघुत्तरी प्रश्न (तीन प्रश्नों में से दो के उत्तर अपेक्षित – प्रत्येक प्रश्न के लिए 05 अंक)	10

॥ विद्या विनयेन शोभते ॥

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Syllabus

Question Paper Pattern (75:25)

**Choice Based Credit Grading and Semester System (CBCGS)
With effect from the Academic Year 2021 -22**

Semester V

Program T.Y.B.A.

Course: Hindi

स्वातंत्र्योत्तर हिन्दी साहित्य-V

शैक्षणिक उद्देश्य :

1. स्वातंत्र्योत्तर हिन्दी उपन्यास एवं उसके कथ्य से विद्यार्थियों को अवगत कराना।
2. स्वातंत्र्योत्तर हिन्दी काव्य एवं काव्य नाटक व उसकी तत्कालीन परिस्थितियों से अवगत कराना।
3. काव्य नाटक की परंपरा से अवगत कराना।
4. आधुनिक साहित्य की समझ एवं समीक्षा का विकास।

परिणाम :

1. पाठ्यक्रम के माध्यम से विद्यार्थियों में सामाजिक, राजनीतिक, धार्मिक एवं सांस्कृतिक विश्वदृष्टि का विकास होगा।
2. विद्यार्थियों में रसास्वादन के कौशल्य का विकास होगा।
3. हिन्दी हेतु उपलब्ध रोजगारों के लिए आवश्यक गुणों का विकास होगा।
4. ज्ञानात्मक आधार पुष्ट होगा।

अध्ययन पद्धति :

1. व्याख्यान तथा विश्लेषण।
2. संगोष्ठी, स्वाध्याय तथा समूह चर्चा।
3. पावर पॉइंट प्रेजेंटेशन, यू ट्यूब वीडियो आदि साधनों का उपयोग।
4. अतिथि विषय विशेषज्ञों के व्याख्यान।

इकाई III रश्मिरथी – कवि - रामधारी सिंह दिनकर -15

1. रामधारी सिंह दिनकर का परिचय ।
2. 'रश्मिरथी' कथावस्तु- आलोचना ।
3. सर्ग – एक से तीन का अध्ययन ।

इकाई IV रश्मिरथी- कवि – रामधारी सिंह दिनकर -15

1. प्रमुख पात्रों का परिचय ।
2. समस्याएँ ।
3. उद्देश्य ।
4. भाषा-शैली ।
5. सर्ग - चार से सात का अध्ययन ।

संदर्भ ग्रंथ

1. खजुराहो का शिल्पी – लेखक – शंकर शेष
2. रश्मि रथी – लेखक - रामधारी सिंह दिनकर
3. समकालीन हिन्दी कविता – रवींद्र भ्रमर
4. नाटककार शंकर शेष – डॉ . सुनीलकुमार लवटे
5. रंगधर्मी नाटककार शंकर शेष – डॉ . प्रकाश जाधव
6. शंकर शेष का नाटक साहित्य - डॉ . प्रकाश जाधव
7. शंकर शेष - रचनावली - एक – संपादक – डॉ . विनय
8. राजपद से जनपद नटशिल्पी शंकर शेष – डॉ . सुरेश और डॉ . वीणा
गौतम
9. राष्ट्रीय कवि दिनकर और उनकी काव्य कला – भूमिका – डॉ . शेखर चंद्र
जैन
10. दिनकर व्यक्तित्व एवं कृतित्व –संपादक –जगदिशप्रसाद चतुर्वेदी
11. आधुनिक हिन्दी काव्य में राष्ट्रीय चेतना का विकास –
डॉ.जितराम पाठक

Semester- VI
T.Y.B.A. Paper No.V

स्वातंत्र्योत्तर हिन्दी साहित्य

Name of the Programme	: B.A.
Name of the Course	: स्वातंत्र्योत्तर हिन्दी साहित्य
Course Code	: UAR6HN5
Total Lectures	: 60
Total credit	: 04

पाठ्यक्रम

- इकाई I 'गांधी से पहले गांधी' -उपन्यास-लेखक-इकबाल दुरानी -15
1. उपन्यासकार इकबाल दुरानी का परिचय ।
 2. उपन्यास की कथावस्तु एवं आलोचना ।
 3. देशकाल- वातावरण ।
 4. पात्र-एवं चरित्र- चित्रण ।
 5. अहिंसात्मक आंदोलन ।
- इकाई II 'गांधी से पहले गांधी'-उपन्यास लेखक-इकबाल दुरानी -15
1. लोक जीवन ।
 2. समस्याएँ ।
 3. उद्देश्य ।
 4. भाषा शैली ।
- इकाई III अंधायुग -नाटक - लेखक - धर्मवीर भारती -15
1. धर्मवीर भारती का परिचय ।
 2. गीति नाटक का स्वरूप ।
 3. अंधायुग नाटक की सप्रसंग व्याख्या ।
 4. अंधायुग - कथावस्तु एवं आलोचना ।
 5. अंधायुग - पात्र एवं चरित्र-चित्रण ।
 6. अंधायुग - देशकाल वातावरण ।

इकाई IV अंधायुग- लेखक – धर्मवीर भारती

-15

1. अंधायुग –समस्याएँ ।
2. अंधायुग – उद्देश्य ।
3. अंधायुग – शीर्षक की सार्थकता ।
4. अंधायुग – भाषा शैली ।
5. काव्य नाटक के रूप में ‘ अंधायुग ‘
6. अंधायुग की रंग प्रस्तुति ।
7. अभिनेयता एवं रंगमंचीयता ।

संदर्भ ग्रंथ

1. गांधी से पहले गांधी - इकबाल दुरानी
2. अंधायुग : पाठ और दर्शन – जयदेवी तनेजा, राष्ट्रीय नाट्य विद्यालय
3. धर्मवीर भारती ग्रंथावली – संपादक – चन्द्रकान्त बांदिवडेकर
4. धर्मवीर भारती की साहित्य साधना – संपादक – पुष्पा भारती
5. हिन्दी नाट्य काव्य : पुनर्मूल्यांकन – हुकूमचंद राजपाल
6. अंधायुग – धर्मवीर भारती

प्रश्नपत्र प्रारूप
पेपर नंबर -V
(Semester –V & VI)

कुल अंक 75

समय : 2:30 घंटे

प्रश्न-1	संदर्भ सहित व्याख्या (दोनों पुस्तकों से आंतरिक विकल्प सहित)	15
प्रश्न-2	दीर्घोत्तरी प्रश्न (इकाई I और II से आंतरिक विकल्प सहित)	15
प्रश्न-3	सामान्य प्रश्न (इकाई III और IV से आंतरिक विकल्प सहित)	15
प्रश्न-4	टिप्पणियाँ (दोनों पुस्तकों से आंतरिक विकल्प सहित)	15
प्रश्न-5	क) वस्तुनिष्ठ प्रश्न	10
	ख) बहुविकल्पी प्रश्न	05

आंतरिक परीक्षण

कुल अंक-25

क	एक कक्ष परीक्षा	20
ख	सक्रिय सहभागिता, नेतृत्व कुशलता, शिष्टाचार तथा समग्र आचरण	05

क एक कक्ष परीक्षा :-

प्रश्न-1	सही जोड़ियाँ / रिक्त स्थान / बहुविकल्पीय प्रश्न	05
प्रश्न-2	अतिलघुत्तरी / एक पंक्ति में उत्तर	05
प्रश्न-3	लघुत्तरी प्रश्न (तीन प्रश्नों में से दो के उत्तर अपेक्षित – प्रत्येक प्रश्न के लिए 05 अंक)	10

॥ विद्या विनयेन शोभते ॥

Janardan Bhagat Shikshan Prasarak Sanstha's

CHANGU KANA THAKUR

**ARTS, COMMERCE & SCIENCE COLLEGE, NEW PANVEL
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Syllabus

Question Paper Pattern (75:25)

**Choice Based Credit Grading and Semester System (CBCGS)
With effect from the Academic Year 2021 - 22**

Semester V

Program T.Y.B.A.

Course: Hindi

हिन्दी में सूचना प्रौद्योगिकी -VI

शैक्षणिक उद्देश्य :

1. सूचना प्रौद्योगिकी के विकास एवं हिन्दी में उसके उपयोग से विद्यार्थियों को अवगत कराना।
2. कंप्यूटर पर हिन्दी में कामकाज से विद्यार्थियों को अवगत कराना।
3. संचार माध्यम और रोजगार की संभावनाओं को स्पष्ट करना।
4. सोशल मीडिया और बदलते हुए भारतीय परिवेश की समझ का विकास करना।

परिणाम :

1. पाठ्यक्रम के माध्यम से विद्यार्थियों में सामाजिक, राजनीतिक, धार्मिक एवं सांस्कृतिक विश्वदृष्टि का विकास होगा।
2. तकनीकी गुणों की समझ विकसित होगी।
3. हिन्दी हेतु उपलब्ध रोजगारों के लिए आवश्यक गुणों का विकास होगा।
4. ज्ञानात्मक आधार पुष्ट होगा।
5. सोशल मीडिया के सकारात्मक एवं नकारात्मक पक्ष की समझ का विकास होगा।

अध्ययन पद्धति :

1. व्याख्यान तथा विश्लेषण।
2. संगोष्ठी, स्वाध्याय तथा समूह चर्चा।
3. पावर पॉइंट प्रेजेंटेशन, यू ट्यूब वीडियो आदि साधनों का उपयोग।
4. अतिथि विषय विशेषज्ञों के व्याख्यान।

Semester- V
T.Y.B.A. Paper No.VI

हिन्दी में सूचना प्रौद्योगिकी

Name of the Programme	: B.A.
Name of the Course	: हिन्दी में सूचना प्रौद्योगिकी
Course Code	: UAR5HN6
Total Lectures	: 60
Total credit	: 04

पाठ्यक्रम

इकाई I सूचना प्रौद्योगिकी -15

1. सूचना प्रौद्योगिकी : अवधारणा, अर्थ, परिभाषा और स्वरूप ।
2. सूचना प्रौद्योगिकी का महत्व ।
3. कंप्यूटर पर हिन्दी में कामकाज समस्याएँ एवं समाधान ।
4. सूचना प्रौद्योगिकी की जीवन में सकारात्मक एवं नकारात्मक भूमिका।

इकाई II इंटरनेट और हिन्दी -15

1. हिन्दी में ईमेल
2. इंटरनेट पर हिन्दी में विज्ञापन
3. सोशल मीडिया में हिन्दी
4. हिन्दी ब्लॉगिंग –
 1. इतिहास एवं विकास
5. हिन्दी साहित्यिक एवं गैर साहित्यिक ई-पत्रिकाएँ

इकाई III

-15

1. हिन्दी सूचना प्रौद्योगिकी- रोजगार की संभावनाएँ।
2. सूचना प्रौद्योगिकी का शिक्षा के क्षेत्र में योगदान ।
3. भारत की ग्रामीण अर्थव्यवस्था के विकास पर सूचना प्रौद्योगिकी का प्रभाव
4. सूचना प्रौद्योगिकी के कारण भारतीय समाज जीवन में परिवर्तन –
 1. सामाजिक
 2. आर्थिक
 3. पारिवारिक

इकाई IV

-15

1. भारत में डिजिटलाजेशन का विकास, उपयोगिता एवं कठिनाइयाँ ।
2. सूचना प्रौद्योगिकी की चुनौतियाँ, समस्याएँ एवं समाधान ।
3. . सूचना प्रौद्योगिकी में सायबर अपराध एवं सुरक्षा की चुनौतियाँ
4. साइबर शिक्षा का महत्व एवं संवैधानिक प्रावधान ।

संदर्भ ग्रंथ

1. आधुनिक जनसंचार और हिन्दी : हरिमोहन
2. कंप्यूटर के भाषिक अनुप्रयोग : विजय कुमार मल्होत्रा
3. कंप्यूटर और हिन्दी : हरिमोहन
4. पत्रकारिता से मीडिया तक : मनोज कुमार
5. इंटरनेट : शशि शुक्ला
6. प्रयोजनमूलक हिन्दी : डॉ . पी. लता
7. प्रयोजनमूलक हिन्दी : रमेश जैन
8. जनसंचार और हिन्दी पत्रकारिता : डॉ . अर्जुन तिवारी
9. प्रयोजनमूलक हिन्दी : डॉ . विनोद गोदरे
10. वर्चुअल रीएलिटी और इंटरनेट : जगदीश्वर चतुर्वेदी
11. आधुनिक सूचना प्रौद्योगिकी का भारतीय समाज पर प्रभाव : संपादक - हरिमोहन धवन
12. भारत की आंतरिक सुरक्षा : अशोक कुमार
13. भारताची अंतर्गत सुरक्षा : डॉ . देवेन्द्र विसपूते
14. सायबर गुन्हे, 21 व्या शतकातील तंत्रज्ञानातील धोका - डॉ . दीपक शिकारपुरे
15. विश्वविद्यालय अनुदान आयोग (बाहरी वेबसाइट जो एक नई विंडो में खुलती हैं)
16. केंद्रीय माध्यमिक शिक्षा मण्डल (बाहरी वेबसाइट जो एक नई विंडो में खुलती हैं)
17. राष्ट्रीय शैक्षणिक अनुसंधान और प्रशिक्षण परिषद (बाहरी वेबसाइट जो एक नई विंडो में खुलती हैं)
18. उच्चतर शिक्षा विभाग (बाहरी वेबसाइट जो एक नई विंडो में खुलती हैं)
19. जनसंपर्क और विज्ञापन : संतोष गोयल
20. भारत में संचार माध्यम जनसंचार : संजीव भानावत
21. सूचना प्रौद्योगिकी, सोशल मीडिया और डिजिटल इंडिया - डॉ. अमरीश सिन्हा
22. आधुनिक सूचना प्रौद्योगिकी का भारतीय समाज पर प्रभाव

Semester- VI
T.Y.B.A. Paper No.VI

सोशल मीडिया

Name of the Programme	: B.A.
Name of the Course	: सोशल मीडिया
Course Code	: UAR6HN6
Total Lectures	: 60
Total credit	: 04

पाठ्यक्रम

इकाई I सोशल मीडिया -15

1. परिभाषा, स्वरूप एवं विकासक्रम ।
2. सोशल मीडिया के गुण और दोष ।
3. सोशल मीडिया के प्रकार –
 1. फ़ेसबुक
 2. व्हाट्सअप
 3. ट्विटर
 4. इंस्टाग्राम

इकाई II -15

1. सोशल मीडिया से प्रभावित क्षेत्र -
 1. राजनीतिक
 2. सामाजिक
 3. युवाओं
 4. बच्चों
 5. महिलाओं
2. मुक्त अभिव्यक्ति और सोशल मीडिया ।
3. सोशल मीडिया की प्रचलित भाषा समाज और संस्कृति के अंतर-प्रभाव ।

इकाई III

-15

- 1.सोशल मीडिया और कानून।
- 2.सोशल मीडिया और बदलता हुआ भारतीय परिवेश ।
- 3.सोशल मीडिया की उपयोगिता एवं उपलब्धियाँ ।
- 4.युनिकोड के माध्यम से देवनागरी लिपि का वैश्विक प्रसार।

इकाई IV

-15

- 1.सोशल मीडिया में हिन्दी का प्रसार और प्रयोग।
- 2.सोशल मीडिया और हिन्दी।
- 3.सोशल मीडिया समस्याएँ, चुनौतियाँ और सीमाएँ।
- 4.सोशल मीडिया का भारतीय समाज और संस्कृति पर प्रभाव।

संदर्भ ग्रंथ

1. सोशल नेटवर्किंग : नए समय का संवाद – संपादक – संजय द्विवेदी
2. नये जमाने की पत्रकारिता : सौरभ शुक्ला
3. सोशल मीडिया : योगेश पटेल
4. उत्तर आधुनिक मीडिया तकनीक : हर्षदेव
5. नई संचार प्रौद्योगिकी पत्रकारिता : कृष्ण कुमार रत्नू
6. हिन्दी भाषा का प्रयोजनमूलक स्वरूप : कैलाश चंद्र भाटिया
7. इंटरनेट : शशि शुक्ला
8. सूचना प्रौद्योगिकी, सोशल मीडिया और डिजिटल इंडिया – डॉ. अमरीश सिन्हा
9. आधुनिक सूचना प्रौद्योगिकी का भारतीय समाज पर प्रभाव

प्रश्नपत्र प्रारूप
पेपर नंबर -V
(Semester –V & VI)

	कुल अंक 75	
	समय : 2:30 घंटे	
प्रश्न-1	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- I से)	15
प्रश्न-2	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- II से)	15
प्रश्न-3	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- III से)	15
प्रश्न-4	टिप्पणी (आंतरिक विकल्प सहित –इकाई- IV से)	15
प्रश्न-5	क) वस्तुनिष्ठ प्रश्न	10
	ख) बहुविकल्पी प्रश्न	05

आंतरिक परीक्षण

	कुल अंक-25	
क	एक कक्ष परीक्षा	20
ख	सक्रिय सहभागिता, नेतृत्व कुशलता, शिष्टाचार तथा समग्र आचरण	05
क	<u>एक कक्ष परीक्षा :-</u>	
प्रश्न-1	सही जोड़ियाँ / रिक्त स्थान / बहुविकल्पीय प्रश्न	05
प्रश्न-2	अतिलघुतरी / एक पंक्ति में उत्तर	05
प्रश्न-3	लघुतरी प्रश्न (तीन प्रश्नों में से दो के उत्तर अपेक्षित – प्रत्येक प्रश्न के लिए 05 अंक)	10

॥ विद्या विनयेन शोभते ॥
Janardan Bhagat Shikshan Prasarak Sanstha's
CHANGU KANA THAKUR
ARTS, COMMERCE & SCIENCE COLLEGE, NEW PANVEL
(AUTONOMOUS)

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Syllabus

Question Paper Pattern (75:25)

Choice Based Credit Grading and Semester System (CBCGS)
With effect from the Academic Year 2021–22

Program T.Y.B.A.

Semester V

Course: Hindi

साहित्य समीक्षा : छंद एवं अलंकार -VII

शैक्षणिक उद्देश्य :

1. साहित्य की परिभाषा, स्वरूप, तत्व, हेतु एवं प्रयोजनों को स्पष्ट करना।
2. कला एवं साहित्य के अंतर तथा संबंधों पर प्रकाश डालना।
3. काव्य के विविध रूपों को स्पष्ट करना।
4. शब्द-शक्ति, रस के विभिन्न पहलुओं को स्पष्ट करना।
5. छंद एवं अलंकारों को स्पष्ट करना।
6. गद्य साहित्य के तत्वों पर प्रकाश डालना।
7. काव्य शास्त्रीय साधनों के आधार पर रचनात्मकता को बढ़ावा देना।

परिणाम :

1. पाठ्यक्रम के माध्यम से विद्यार्थियों में सामाजिक, राजनीतिक, धार्मिक एवं सांस्कृतिक विश्वदृष्टि का विकास होगा।
2. विद्यार्थियों में रसास्वादन के कौशल्य का विकास होगा।
3. हिन्दी हेतु उपलब्ध रोजगारों के लिए आवश्यक गुणों का विकास होगा।
4. ज्ञानात्मक आधार पुष्ट होगा।

अध्ययन पद्धति :

1. व्याख्यान तथा विश्लेषण।
2. संगोष्ठी, स्वाध्याय तथा समूह चर्चा।
3. पावर पॉइंट प्रेजेंटेशन, यू ट्यूब वीडियो आदि साधनों का उपयोग।
4. अतिथि विषय विशेषज्ञों के व्याख्यान।

Semester- V

T.Y.B.A.
साहित्य समीक्षा छंद एवं अलंकार -VII

Name of the Programme	: B.A.
Name of the Course	: साहित्य समीक्षा : छंद एवं अलंकार-VII
Course Code	: UAR5HN7
Total Lectures	: 60
Total credit	: 04

पाठ्यक्रम

- इकाई I काव्य -10**
१. काव्य का स्वरूप और परिभाषा (भारतीय एवं पाश्चात्य) ।
 २. काव्य के तत्व ।
 ३. काव्य के हेतु ।
 ४. काव्य के प्रयोजन (केवल भारतीय) ।
- इकाई II कला -10**
१. कला की परिभाषा और वर्गीकरण ।
 २. कला और साहित्य का अंतःसंबंध ।
 ३. कला के प्रयोजन ।
- इकाई III काव्य के रूप -20**
१. महाकाव्य : भारतीय एवं पाश्चात्य मान्यताओं का परिचय ।
 २. खंडकाव्य : स्वरूप और विशेषताएँ ।
 ३. मुक्तक काव्य : स्वरूप और विशेषताएँ ।
 ४. गीतिकाव्य : स्वरूप और विशेषताएँ ।
 ५. गजल का स्वरूप और विशेषताएँ ।
 ६. रुबाइयाँ सामान्य परिचय ।

I मात्रिक छंद

१. चौपाई
२. रोला
३. दोहा
४. बरवै
५. हरिगीतिका
६. गीतिका
७. छप्पय
८. कुण्डलिया

II वर्णिक छंद

१. इंद्रवज्रा
२. शार्दूलविक्रीडित
३. भूजंगप्रयात
४. द्रुतविलंबित
५. मालिनी
६. मन्दाक्रान्ता
७. सवैया
८. कवित्त

संदर्भ ग्रंथ

1. काव्य के रूप – बाबू गुलाबराय
2. भारतीय काव्यशास्त्र की परंपरा – डॉ . नगेन्द्र
3. सिद्धांत और अध्ययन – बाबू गुलाबराय
4. काव्यशास्त्र – डॉ . भगिरथ मिश्र
5. काव्य प्रदीप – श्री . रामबहोरी शुक्ल
6. छंद प्रकाश – श्री . रघुनन्दन शास्त्री
7. अकादमिक हिन्दी व्याकरण – डॉ . भंडारे उद्धव तुकाराम
8. निबंधमाला हिन्दी निबंध – डॉ . भंडारे उद्धव तुकाराम
9. साहित्य सहचर –आचार्य हजारी प्रसाद द्विवेदी
- 10.साहित्य विवेचन – सुमन एवं मलिक
- 11.हिन्दी आलोचना के बीज शब्द – डॉ . बच्चन सिंह
- 12.हिन्दी साहित्य कोश – ज्ञानमंडल प्रकाशन वाराणसी
- 13.हिन्दी नाटक – डॉ . बच्चन सिंह
- 14.साहित्य विधाओं की प्रकृति – संपादक – देवीशंकर अवस्थी
- 15.कला – हंस कुमार तिवारी
- 16.आधुनिक साहित्य चिंतन – डॉ . हरीश अरोड़ा, डॉ . गुँजनकुमार झा
- 17.भारतीय कला का इतिहास – डॉ . भागवत शरण उपाध्याय
- 18.भारतीय काव्यशास्त्र के सिद्धांत – डॉ . कृष्णदेव झारी
- 19.भारतीय काव्यशास्त्र – डॉ . मानवेंद्र पाठक
- 20.आधुनिक गीतिकाव्य – डॉ . उमाशंकर तिवारी
- 21.भारतीय साहित्य शास्त्र – डॉ . बलदेव उपाध्याय
- 22.भारतीय काव्यशास्त्र – डॉ . योगेंद्र प्रताप सिंह

Semester- VI
T.Y.B.A.

साहित्य समीक्षा: छंद एवं अलंकार –VII

Name of the Programme	: B.A.
Name of the Course	: साहित्य समीक्षा : छंद एवं अलंकार-VII
Course Code	: UAR6HN7
Total Lectures	: 60
Total credit	: 04

पाठ्यक्रम

इकाई I	शब्द-शक्ति	-10
	१. शब्द-शक्ति: अर्थ, परिभाषा और स्वरूप ।	
	२. शब्द-शक्ति के प्रकार- (अभिधा, लक्षणा एवं व्यंजना का सामान्य परिचय)	
इकाई II	रस	-10
	१. रस का अर्थ एवं स्वरूप ।	
	२. रस के विविध अंग ।	
	३. रस के भेद : सामान्य परिचय ।	
इकाई III	गद्य के विविध रूप	-20
	१. नाटक के तत्व (भारतीय मान्यता के अनुसार)।	
	२. उपन्यास : परिभाषा, स्वरूप, एवं प्रमुख तत्व ।	
	३. कहानी : परिभाषा, स्वरूप, एवं प्रमुख तत्व ।	
	४. निबंध : स्वरूप तथा सामान्य विशेषताएँ ।	
	५. आत्मकथा का तात्विक विवेचन ।	
	६. जीवनी का तात्विक विवेचन ।	
	७. संस्मरण का तात्विक विवेचन ।	
	८. रेखाचित्र तात्विक विवेचन ।	

इकाई IV अलंकार – अलंकारों का लक्षण तथा उदाहरण सहित -20
सामान्य परिचय

I शब्दालंकार

१. अनुप्रास
२. यमक
३. श्लेष
४. पुनरुक्तिप्रकाश
५. वीप्सा
६. वक्रोक्ति

II अर्थालंकार

१. उपमा
२. रूपक
३. अतिशयोक्ति
४. विभावना
५. उत्प्रेक्षा
६. प्रतीप
७. व्याजस्तुति
८. भ्रान्तिमान
९. दृष्टान्त

संदर्भ ग्रंथ

- 23.काव्य के रूप – बाबू गुलाबराय
- 24.भारतीय काव्यशास्त्र की परंपरा – डॉ . नगेन्द्र
- 25.सिद्धांत और अध्ययन – बाबू गुलाबराय
- 26.काव्यशास्त्र – डॉ . भगिरथ मिश्र
- 27.काव्य प्रदीप – श्री . रामबहोरी शुक्ल
- 28.छंद प्रकाश – श्री . रघुनन्दन शास्त्री
- 29.अकादमिक हिन्दी व्याकरण – डॉ . भंडारे उद्धव तुकाराम
- 30.निबंधमाला हिन्दी निबंध – डॉ . भंडारे उद्धव तुकाराम
- 31.साहित्य सहचर –आचार्य हजारी प्रसाद द्विवेदी
- 32.साहित्य विवेचन – सुमन एवं मलिक
- 33.हिन्दी आलोचना के बीज शब्द – डॉ . बच्चन सिंह
- 34.हिन्दी साहित्य कोश – ज्ञानमंडल प्रकाशन वाराणसी
- 35.हिन्दी नाटक – डॉ . बच्चन सिंह
- 36.साहित्य विधाओं की प्रकृति – संपादक – देवीशंकर अवस्थी
- 37.कला – हंस कुमार तिवारी
- 38.आधुनिक साहित्य चिंतन – डॉ . हरीश अरोड़ा, डॉ . गुँजनकुमार झा
- 39.भारतीय कला का इतिहास – डॉ . भागवत शरण उपाध्याय
- 40.भारतीय काव्यशास्त्र के सिद्धांत – डॉ . कृष्णदेव झारी
- 41.भारतीय काव्यशास्त्र – डॉ . मानवेंद्र पाठक
- 42.आधुनिक गीतिकाव्य – डॉ . उमाशंकर तिवारी
- 43.भारतीय साहित्य शास्त्र – डॉ . बलदेव उपाध्याय
- 44.भारतीय काव्यशास्त्र – डॉ . योगेंद्र प्रताप सिंह

प्रश्नपत्र प्रारूप
पेपर नंबर -VII
(Semester –V & VI)

		कुल अंक- 75
		समय : 2:30 घंटे
प्रश्न-1	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- I से)	15
प्रश्न-2	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- II से)	15
प्रश्न-3	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- III से)	15
प्रश्न-4	छंद /अलंकार (छः में से तीन अपेक्षित –इकाई- IV से)	15
प्रश्न-5	क) वस्तुनिष्ठ प्रश्न	10
	ख) बहुविकल्पी प्रश्न	05

आंतरिक परीक्षण

		कुल अंक-25
क	एक कक्ष परीक्षा	20
ख	सक्रिय सहभागिता, नेतृत्व कुशलता, शिष्टाचार तथा समग्र आचरण	05
क	<u>एक कक्ष परीक्षा :-</u>	
प्रश्न-1	सही जोड़ियाँ / रिक्त स्थान / बहुविकल्पीय प्रश्न	05
प्रश्न-2	अतिलघुत्तरी / एक पंक्ति में उत्तर	05
प्रश्न-3	लघुत्तरी प्रश्न (तीन प्रश्नों में से दो के उत्तर अपेक्षित – प्रत्येक प्रश्न के लिए 05 अंक)	10

॥ विद्या विनयेन शोभते ॥
Janardan Bhagat Shikshan Prasarak Sanstha's
CHANGU KANA THAKUR
ARTS, COMMERCE & SCIENCE COLLEGE, NEW PANVEL
(AUTONOMOUS)

Affiliated to University of Mumbai



Syllabus

Question Paper Pattern (75:25)

Choice Based Credit Grading and Semester System (CBCGS)
With effect from the Academic Year 2021-22

Program T.Y.B.A.

Semester V

Course: Hindi

भाषा विज्ञान : हिन्दी भाषा और व्याकरण –VIII

शैक्षणिक उद्देश्य :

1. भाषा विज्ञान एवं उसके विविध अंगों को स्पष्ट करना।
2. भाषा में परिवर्तन के विविध रूपों को स्पष्ट करना।
3. हिन्दी वर्ण विचार को स्पष्ट करना।
4. भाषा विज्ञान एवं व्याकरण की संकल्पनाओं का दैनंदिन जीवन में प्रयोग हेतु विद्यार्थियों को प्रेरित करना।

परिणाम :

1. पाठ्यक्रम के माध्यम से विद्यार्थियों में सामाजिक, राजनीतिक, धार्मिक एवं सांस्कृतिक विश्वदृष्टि का विकास होगा।
2. विद्यार्थियों में रसास्वादन के कौशल्य का विकास होगा।
3. हिन्दी हेतु उपलब्ध रोजगारों के लिए आवश्यक गुणों का विकास होगा।
4. भाषिक आधार पुष्ट होगा।
5. व्याकरणिक आधार पुष्ट होगा।

अध्ययन पद्धति :

5. व्याख्यान तथा विश्लेषण।
6. संगोष्ठी, स्वाध्याय तथा समूह चर्चा।
7. पावर पॉइंट प्रेजेंटेशन, यू ट्यूब वीडियो आदि साधनों का उपयोग।
8. अतिथि विषय विशेषज्ञों के व्याख्यान।

Semester- V

T.Y.B.A.

भाषा विज्ञान : हिन्दी भाषा और व्याकरण –VIII

Name of the Programme	: B.A.
Name of the Course	: भाषा विज्ञान : हिन्दी भाषा और व्याकरण –VIII
Course Code	: UAR5HN8
Total Lectures	: 60
Total credit	: 04

पाठ्यक्रम

इकाई I	भाषा	-20
	१. भाषा की परिभाषा एवं अभिलक्षण ।	
	२. भाषा के विविध रूप । (बोली, राष्ट्रभाषा, राजभाषा, संपर्क भाषा)	
	३. भाषा परिवर्तन के प्रमुख कारण ।	
इकाई II	भाषा विज्ञान	-10
	१. भाषा विज्ञान : परिभाषा और उपयोगिता	
	२. भाषा विज्ञान की प्रमुख शाखाएँ, सामान्य परिचय । (ध्वनि विज्ञान, शब्द विज्ञान, रूप विज्ञान, वाक्य विज्ञान, अर्थ विज्ञान)	
इकाई III	हिन्दी व्याकरण	-10
	१. वर्णविचार : हिन्दी ध्वनियों का वर्गीकरण ।	
	२. कारक के भेद एवं उनकी विभक्तियाँ ।	

१. संज्ञा : रूपांतर के आधार ।
२. सर्वनाम : कारक रचना ।
३. विशेषण : रूपांतर के आधार ।
४. क्रिया के रूपांतर के आधार । (वाच्य, काल, पुरुष, वचन और लिंग)

संदर्भ ग्रंथ

1. हिन्दी भाषा और लिपि – डॉ . धीरेन्द्र वर्मा
2. हिन्दी भाषा का इतिहास – डॉ . भोलानाथ तिवारी
3. भाषा विज्ञान – डॉ . भोलानाथ तिवारी
4. हिन्दी ध्वनियों का विकास – डॉ . भोलानाथ तिवारी
5. हिन्दी व्याकरण – पं . कामता प्रसाद गुरु
6. हिन्दी शब्दानुशासन –आचार्य किशोरीदास वाजपेयी
7. भाषा विज्ञान की भूमिका – डॉ . देवेंद्रनाथ शर्मा
8. भाषा विज्ञान और भाषा शास्त्र – डॉ . कपिलदेव द्विवेदी
9. हिन्दी व्याकरण और रचना – वासुदेवनन्दन प्रसाद
10. हिन्दी व्याकरण मीमांसा – डॉ . उदय नारायण तिवारी
11. आधुनिक भाषा विज्ञान के सिद्धांत – डॉ . राम किशोर शर्मा
12. व्यावहारिक हिन्दी – डॉ . मानवेंद्र पाठक

२. खड़ी बोली हिन्दी के विविध रूप -

1. हिन्दी
2. हिंदुस्तानी
3. दक्खिनी

इकाई III

-10

१. हिन्दी का शब्द समूह ।
२. देवनागरी लिपि : विशेषताएँ एवं महत्व ।

इकाई IV हिन्दी व्याकरण

-20

१. वाक्य रचना -
 1. वाक्य की परिभाषा, अर्थ और रचना की दृष्टि से प्रकार ।
 2. हिन्दी वाक्य रचना में पदक्रम, अध्याहार संबंधी सामान्य नियम ।
२. समास एवं संधि -
 1. समास : अर्थ, स्वरूप तथा प्रमुख भेदों का सामान्य परिचय ।
 2. संधि : अर्थ, स्वरूप तथा प्रमुख भेदों का सामान्य परिचय ।

संदर्भ ग्रंथ

1. हिन्दी भाषा और लिपि – डॉ . धीरेन्द्र वर्मा
2. हिन्दी भाषा का इतिहास – डॉ . भोलानाथ तिवारी
3. भाषा विज्ञान – डॉ . भोलानाथ तिवारी
4. हिन्दी ध्वनियों का विकास – डॉ . भोलानाथ तिवारी
5. हिन्दी व्याकरण – पं. कामता प्रसाद गुरु
6. हिन्दी शब्दानुशासन –आचार्य किशोरीदास वाजपेयी
7. भाषा विज्ञान की भूमिका – डॉ . देवेंद्रनाथ शर्मा
8. भाषा विज्ञान और भाषा शास्त्र – डॉ . कपिलदेव द्विवेदी
9. हिन्दी व्याकरण और रचना – वासुदेवनन्दन प्रसाद
10. हिन्दी व्याकरण मीमांसा – डॉ . उदय नारायण तिवारी
11. आधुनिक भाषा विज्ञान के सिद्धांत – डॉ . राम किशोर शर्मा
12. व्यावहारिक हिन्दी – डॉ . मानवेंद्र पाठक

प्रश्नपत्र प्रारूप
पेपर नंबर -VIII
(Semester –V & VI)

		कुल अंक- 75
		समय : 2:30 घंटे
प्रश्न-1	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- I से)	15
प्रश्न-2	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- II से)	15
प्रश्न-3	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- III से)	15
प्रश्न-4	टिप्पणी (आंतरिक विकल्प सहित –इकाई- IV से)	15
प्रश्न-5	क) वस्तुनिष्ठ प्रश्न	10
	ख) बहुविकल्पी प्रश्न	05

आंतरिक परीक्षण

		कुल अंक-25
क	एक कक्ष परीक्षा	20
ख	सक्रिय सहभागिता, नेतृत्व कुशलता, शिष्टाचार तथा समग्र आचरण	05
क	<u>एक कक्ष परीक्षा :-</u>	
प्रश्न-1	सही जोड़ियाँ / रिक्त स्थान / बहुविकल्पीय प्रश्न	05
प्रश्न-2	अतिलघुत्तरी / एक पंक्ति में उत्तर	05
प्रश्न-3	लघुत्तरी प्रश्न (तीन प्रश्नों में से दो के उत्तर अपेक्षित – प्रत्येक प्रश्न के लिए 05 अंक)	10

॥ विद्या विनयेन शोभते ॥
Janardan Bhagat Shikshan Prasarak Sanstha's
CHANGU KANA THAKUR
ARTS, COMMERCE & SCIENCE COLLEGE, NEW PANVEL
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Syllabus

Question Paper Pattern (75:25)

Choice Based Credit Grading and Semester System (CBCGS)
With effect from the Academic Year 2021-22

Program T.Y.B.A.

Semester V

Course: Hindi

जनसंचार माध्यम -IX

शैक्षणिक उद्देश्य :

1. जनसंचार की अवधारणा, तत्व, प्रक्रिया एवं उपयोगिता से अवगत कराना।
2. विविध जनसंचार माध्यमों से अवगत करना।
3. जनसंचार माध्यमों की भाषा से अवगत करना।
4. लघुफिल्म तथा वृत्तचित्र के सभी अंगों से अवगत कराना।
5. विज्ञापन और कानून से अवगत कराना।
6. विज्ञापन की भाषा, स्वरूप आदि से अवगत कराना।

परिणाम :

1. पाठ्यक्रम के माध्यम से विद्यार्थियों में सामाजिक, राजनीतिक, धार्मिक एवं सांस्कृतिक विश्वदृष्टि का विकास होगा।
2. विद्यार्थियों में रसास्वादन के कौशल्य का विकास होगा।
3. हिन्दी हेतु उपलब्ध रोजगारों के लिए आवश्यक गुणों का विकास होगा।
4. ज्ञानात्मक आधार पुष्ट होगा।

अध्ययन पद्धति :

1. व्याख्यान तथा विश्लेषण।
2. संगोष्ठी, स्वाध्याय तथा समूह चर्चा।
3. पावर पॉइंट प्रेजेंटेशन, यू ट्यूब वीडियो आदि साधनों का उपयोग।
4. अतिथि विषय विशेषज्ञों के व्याख्यान।

Semester- V

T.Y.B.A.

संचार माध्यम -IX

Name of the Programme	: B.A.
Name of the Course	: संचार माध्यम -IX
Course Code	: UAR5HN9
Total Lectures	: 60
Total credit	: 04

पाठ्यक्रम

- इकाई I जनसंचार माध्यम -15
1. जनसंचार की अवधारणा एवं स्वरूप ।
 2. जनसंचार के तत्व ।
 3. जनसंचार की प्रक्रिया, उपयोगिता ।
- इकाई II जनसंचार माध्यमों का सामान्य परिचय - -15
1. पारंपारिक जनसंचार माध्यम -
 1. तमाशा
 2. लावणी
 3. कठपुतली
 4. रामलीला
 5. नौटंकी
 2. आधुनिक जनसंचार माध्यम -
 1. समाचार -पत्र
 2. रेडियो
 3. सिनेमा
 4. दूरदर्शन
 5. मोबाईल

इकाई III आधुनिक जनसंचार माध्यमों का विकास एवं उपयोगिता -15

1. समाचार-पत्र
2. रेडियो
3. सिनेमा
4. दूरदर्शन
5. मोबाईल

इकाई IV जनसंचार माध्यमोपयोगी लेखन- -15

1. समाचार लेखन
2. पटकथा लेखन
3. साक्षात्कार लेखन
4. संवाद लेखन
5. फीचर लेखन

संदर्भ ग्रंथ

१. जनसंचार माध्यम और पत्रकारिता सर्वांग –जीतेंद्र व्यास
२. जनसंचार माध्यम और हिन्दी पत्रकारिता – डॉ . अर्जुन तिवारी
३. जनसंचार माध्यम – हरीश अरोड़ा
४. प्रयोजनमूलक तथा व्यावहारिक हिन्दी – डॉ . अंबादास देशमुख
५. प्रयोजनमूलक हिन्दी – डॉ . माधव सोनटक्के
६. हिन्दी सिनेमा – डॉ . चन्द्रकान्त मिसाल
७. हिन्दी पत्रकारिता – डॉ . कृष्ण बिहारी मिश्र
८. समाचार पत्रों का इतिहास – अंबिका प्रसाद वाजपेयी
९. भारतीय पत्रकारिता कोश – विजय दत्त श्रीधर

Semester- VI

T.Y.B.A.

संचार माध्यम -IX

Name of the Programme	: B.A.
Name of the Course	: संचार माध्यम -IX
Course Code	: UAR6HN9
Total Lectures	: 60
Total credit	: 04

पाठ्यक्रम

इकाई I	संचार माध्यम की भाषा -	-10
	1. मुद्रित माध्यम ।	
	2. रेडियो ।	
	3. सिनेमा ।	
	४. दूरदर्शन ।	
इकाई II	विज्ञापन -	-20
	1. परिभाषा एवं स्वरूप ।	
	2. विज्ञापन की भाषा ।	
	3. मुद्रित विज्ञापन ।	
	4. रेडियो विज्ञापन ।	
	5. दूरदर्शन विज्ञापन ।	
	6. विज्ञापन और नैतिकता ।	
	7. विज्ञापन और कानून ।	

इकाई III वृत्तचित्र और लघु फिल्म - -20

1. वृत्तचित्र :अर्थ, स्वरूप एवं लेखन ।
1. वृत्तचित्र की उपयोगिता एवं महत्त्व ।
2. लघुफिल्म का अर्थ एवं स्वरूप ।
3. लघु फिल्मों की उपयोगिता एवं महत्त्व ।

इकाई IV फिल्म प्रभाव - -10

1. फिल्म सोससीटी आंदोलन ।
2. फिल्म प्रभाग का सामान्य परिचय ।
3. भारतीय बाल चित्र समिति ।
4. भारतीय फिल्म संस्थान पुणे का सामान्य परिचय एवं योगदान ।

संदर्भ ग्रंथ

१. जनसंचार माध्यम और पत्रकारिता सर्वांग –जीतेंद्र व्यास
२. जनसंचार माध्यम और हिन्दी पत्रकारिता – डॉ . अर्जुन तिवारी
३. जनसंचार माध्यम – हरिश अरोड़ा
४. प्रयोजनमूलक तथा व्यावहारिक हिन्दी – डॉ . अंबादास देशमुख
५. प्रयोजनमूलक हिन्दी – डॉ . माधव सोनटक्के
६. हिन्दी सिनेमा – डॉ . चन्द्रकान्त मिसाल
७. हिन्दी पत्रकारिता – डॉ . कृष्ण बिहारी मिश्र
८. समाचार पत्रों का इतिहास – अंबिका प्रसाद वाजपेयी
९. भारतीय पत्रकारिता कोश – विजय दत्त श्रीधर

प्रश्नपत्र प्रारूप
पेपर नंबर -IX
(Semester –V & VI)

		कुल अंक- 75
		समय : 2: 30 घंटे
प्रश्न-1	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- I से)	15
प्रश्न-2	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- II से)	15
प्रश्न-3	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- III से)	15
प्रश्न-4	टिप्पणी (आंतरिक विकल्प सहित –इकाई- IV से)	15
प्रश्न-5	क) वस्तुनिष्ठ प्रश्न	10
	ख) बहुविकल्पी प्रश्न	05

आंतरिक परीक्षण

		कुल अंक-25
क	एक कक्ष परीक्षा	20
ख	सक्रिय सहभागिता, नेतृत्व कुशलता, शिष्टाचार तथा समग्र आचरण	05
क	<u>एक कक्ष परीक्षा :-</u>	
प्रश्न-1	सही जोड़ियाँ / रिक्त स्थान / बहुविकल्पीय प्रश्न	05
प्रश्न-2	अतिलघुत्तरी / एक पंक्ति में उत्तर	05
प्रश्न-3	लघुत्तरी प्रश्न (तीन प्रश्नों में से दो के उत्तर अपेक्षित – प्रत्येक प्रश्न के लिए 05 अंक)	10

॥ विद्या विनयेन शोभते ॥

Janardan Bhagat Shikshan Prasarak Sanstha's

Board of Examinations and Evaluation, C.K. Thakur A.C.S. College, New Panvel 63 |

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**CHANGU KANA THAKUR
ARTS, COMMERCE & SCIENCE COLLEGE, NEW PANVEL
(AUTONOMOUS)**

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Syllabus

Question Paper Pattern (75:25)

**Choice Based Credit Grading and Semester System (CBCGS)
With effect from the Academic Year 2021-22**

Program T.Y.B.A.

Semester V

Course: Hindi

आधुनिक हिन्दी साहित्य की वैचारिक पृष्ठभूमि -IX

शैक्षणिक उद्देश्य :

1. आधुनिक हिन्दी साहित्य की वैचारिक पृष्ठभूमि को स्पष्ट करना।
2. आर्य सामाज के सामाजिक, दार्शनिक सिद्धांत को स्पष्ट करते हुए विद्यार्थियों को उस मार्ग प्र चलने के लिए मार्गदर्शन देना।
3. मार्क्सवाद, दलित चेतना एवं मनोविक्षेपणवाद के माध्यम से विद्यार्थियों में जागरूकता लाना।
4. राष्ट्रीय चेतना के विकास में हिन्दी पत्र-पत्रिकाओं के योगदान से विद्यार्थियों को अवगत कराना।

परिणाम :

5. पाठ्यक्रम के माध्यम से विद्यार्थियों में सामाजिक, राजनीतिक, धार्मिक एवं सांस्कृतिक विश्वदृष्टि का विकास होगा।
6. विद्यार्थियों में रसास्वादन के कौशल्य का विकास होगा।
7. हिन्दी हेतु उपलब्ध रोजगारों के लिए आवश्यक गुणों का विकास होगा।
8. ज्ञानात्मक आधार पुष्ट होगा।

अध्ययन पद्धति :

5. व्याख्यान तथा विक्षेपण।
6. संगोष्ठी, स्वाध्याय तथा समूह चर्चा।
7. पावर पॉइंट प्रेजेंटेशन, यू ट्यूब वीडियो आदि साधनों का उपयोग।
8. अतिथि विषय विशेषज्ञों के व्याख्यान।

Semester- V

T.Y.B.A.

आधुनिक हिन्दी साहित्य की वैचारिक पृष्ठभूमि -IX

Name of the Programme	: B.A.
Name of the Course	: आधुनिक हिन्दी साहित्य की वैचारिक पृष्ठभूमि-IX
Course Code	: UAR5HN9
Total Lectures	: 60
Total credit	: 04

पाठ्यक्रम

- इकाई I भारतीय नव जागरण आंदोलन और हिन्दी साहित्य -20
पर उसका प्रभाव (सामाजिक दृष्टि से होने वाले
वैचारिक एवं व्यावहारिक बदलाव के विशेष संदर्भ में)
1. भारतीय नवजागरण आंदोलन ।
 - (1. ब्रम्ह समाज
 - (2. प्रार्थना समाज
 - (3. रामकृष्ण मिशन
 - (4. थियोसोफिकल सोसायटी
 - (5. सत्यशोधक समाज का परिचय एवं मान्यताएँ
 २. आर्य समाज के सामाजिक दार्शनिक सिद्धांतों का हिन्दी
कविता और उपन्यास पर प्रभाव
- इकाई II गाँधीवादी चिंतन का हिन्दी कविता और उपन्यास पर -10
प्रभाव
- इकाई III मार्क्सवाद : हिन्दी कविता और हिन्दी कथा साहित्य -10
पर प्रभाव
- इकाई IV राष्ट्रीय चेतना के विकास में हिन्दी पत्र-पत्रिकाओं का -20

योगदान -

1. हरिश्चंद्र मैगजीन
2. हिन्दुस्थान
3. हिन्दी प्रदीप
4. सरस्वती
5. स्वराज
6. कर्मवीर
7. चांद और मतवाला के विशेष संदर्भ में ।

संदर्भ ग्रंथ :

1. बंगाल में स्वदेशी आंदोलन –सुमित सरकार
2. आज का भारत – रजनी पामदत्त
3. सत्य के प्रयोग – मोहनदास करमचंद गांधी
4. गुलामी – ज्योतिराव फुले
5. हिन्दी साहित्य में प्रतिबंधित चिंतन प्रवाह – सुधाकर गोकाकर और गो. रा. कुलकर्णी
6. हिन्दी साहित्य पर गाँधीवादी प्रभाव – डॉ . अरविंद जोशी
7. मार्क्सवाद – यशपाल
8. निबंधमाला हिन्दी निबंध – डॉ . भंडारे उद्धव तुकाराम
9. दलित देवो भव – किशोर कुणाल
10. समाचार पत्रों का इतिहास – अंबिका प्रसाद वाजपेयी
11. हिन्दी पत्रकारिता – डॉ . कृष्ण बिहारी मिश्र
12. मनोविश्लेषण – सिगमंड , फ्राइड
13. भारतीय पत्रकारिता कोश – विजय दत्त श्रीधर
14. मार्क्सवादी साहित्य चिंतन – शिवकुमार मिश्र
15. दलित साहित्य का समाज शास्त्र – ओमप्रकाश वाल्मीकि
16. आधुनिकता के आईने में दलित – अभी कुमार दुबे
17. भारतीय समाज में नारी – नीरा देसाई
18. आधुनिक हिन्दी कविता में मनोविज्ञान – डॉ . उर्वशी ज. सुरती
19. भारतीय दलित आंदोलन का इतिहास – मोहनदास नैमिशराय
20. आधुनिक हिन्दी कथा साहित्य और मनोविज्ञान – डॉ . देवराज उपाध्याय
21. मनोविज्ञान का इतिहास – डॉ . सप्रसाद पांडे
22. दलित वैचारिकी की दिशाएँ – सं . बद्दीनारायण
23. हिन्दी उपन्यास में दलित वर्ग – कुसुम मेघवाल
24. दलित चेतना और समकालीन हिन्दी उपन्यास – डॉ. मुन्ना तिवारी
25. आदिवासी शौर्य और विद्रोह – सं . रमणिका गुप्ता
26. आदिवासी साहित्य यात्रा - सं . रमणिका गुप्ता

Semester- VI

T.Y.B.A.

आधुनिक हिन्दी साहित्य की वैचारिक पृष्ठभूमि -IX

Name of the Programme	: B.A.
Name of the Course	: आधुनिक हिन्दी साहित्य की वैचारिक पृष्ठभूमि-IX
Course Code	: UAR6HN9
Total Lectures	: 60
Total credit	: 04

पाठ्यक्रम

- इकाई I मनोविक्षेपणवाद : सामान्य परिचय और हिन्दी उपन्यास पर उसका प्रभाव । -10
- इकाई II दलित चेतना : हिन्दी कविता तथा कथा साहित्य पर प्रभाव । -20
- इकाई III समकालीन कथा साहित्य में आदिवासी विमर्श । -10
- इकाई IV स्वातंत्र्योत्तर जन चेतना और हिन्दी पत्रकारिता : -20
1. धर्मयुग
 2. आलोचना
 3. हंस
 4. कथादेश
 5. इंडिया टुडे
 6. आज और नवभारत टाइम्स (अभिव्यक्ति के विशेष संदर्भ में)

संदर्भ ग्रंथ :

1. बंगाल में स्वदेशी आंदोलन –सुमित सरकार
2. आज का भारत – रजनी पामदत्त
3. सत्य के प्रयोग – मोहनदास करमचंद गांधी
4. गुलामी – ज्योतिराव फुले
5. हिन्दी साहित्य में प्रतिबंधित चिंतन प्रवाह – सुधाकर गोकाकर और गो. रा. कुलकर्णी
6. हिन्दी साहित्य पर गाँधीवादी प्रभाव – डॉ . अरविंद जोशी
7. मार्क्सवाद – यशपाल
8. निबंधमाला हिन्दी निबंध – डॉ . भंडारे उद्धव तुकाराम
9. दलित देवो भव – किशोर कुणाल
10. समाचार पत्रों का इतिहास – अंबिका प्रसाद वाजपेयी
11. हिन्दी पत्रकारिता – डॉ . कृष्ण बिहारी मिश्र
12. मनोविश्लेषण – सिगमंड , फ्राइड
13. भारतीय पत्रकारिता कोश – विजय दत्त श्रीधर
14. मार्क्सवादी साहित्य चिंतन – शिवकुमार मिश्र
15. दलित साहित्य का समाज शास्त्र – ओमप्रकाश वाल्मीकि
16. आधुनिकता के आईने में दलित – अभी कुमार दुबे
17. भारतीय समाज में नारी – नीरा देसाई
18. आधुनिक हिन्दी कविता में मनोविज्ञान – डॉ . उर्वशी ज. सुरती
19. भारतीय दलित आंदोलन का इतिहास – मोहनदास नैमिशराय
20. आधुनिक हिन्दी कथा साहित्य और मनोविज्ञान – डॉ . देवराज उपाध्याय
21. मनोविज्ञान का इतिहास – डॉ . सप्रसाद पांडे
22. दलित वैचारिकी की दिशाएँ – सं . बद्रीनारायण
23. हिन्दी उपन्यास में दलित वर्ग – कुसुम मेघवाल
24. दलित चेतना और समकालीन हिन्दी उपन्यास – डॉ. मुन्ना तिवारी
25. आदिवासी शौर्य और विद्रोह – सं . रमणिका गुप्ता
26. आदिवासी साहित्य यात्रा – डॉ. रमणिका गुप्ता

प्रश्नपत्र प्रारूप
पेपर नंबर -IX
(Semester –V & VI)

	कुल अंक 75	
	समय : 2:30 घंटे	
प्रश्न-1	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- I से)	15
प्रश्न-2	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- II से)	15
प्रश्न-3	दीर्घोत्तरी प्रश्न (आंतरिक विकल्प सहित –इकाई- III से)	15
प्रश्न-4	टिप्पणी (आंतरिक विकल्प सहित –इकाई- IV से)	15
प्रश्न-5	क) वस्तुनिष्ठ प्रश्न	10
	ख) बहुविकल्पी प्रश्न	05

आंतरिक परीक्षण

	कुल अंक-25	
क	एक कक्ष परीक्षा	20
ख	सक्रिय सहभागिता, नेतृत्व कुशलता, शिष्टाचार तथा समग्र आचरण	05
क	<u>एक कक्ष परीक्षा :-</u>	
प्रश्न-1	सही जोड़ियाँ / रिक्त स्थान / बहुविकल्पीय प्रश्न	05
प्रश्न-2	अतिलघुत्तरी / एक पंक्ति में उत्तर	05
प्रश्न-3	लघुत्तरी प्रश्न (तीन प्रश्नों में से दो के उत्तर अपेक्षित – प्रत्येक प्रश्न के लिए 05 अंक)	10



II विद्या विनयेन शोभते II

Janardan Bhagat Shikshan Prasarak Sanstha's
CHANGU KANA THAKUR
ARTS, COMMERCE & SCIENCE COLLEGE,
NEW PANVEL (AUTONOMOUS)

Re-accredited 'A+' Grade by NAAC
'College with Potential for Excellence' Status Awarded by UGC
'Best College Award' by University of Mumbai
Program: B.A.

Revised Syllabus of T.Y.B. A. Geography
Paper No. IV to IX
for
Semester V and VI
Choice Based Credit & Grading System (75:25)
w.e.f. Academic Year 2021-22

Details of the course:

Sr. No.	Heading	Particulars
1	Title of Course	Geography
2	Eligibility for Admission	Second Year B.A
3	Passing marks	40%
4	Ordinances/Regulations (if any)	---
5	No. of Semesters	Two
6	Level	U.G.
7	Pattern	Semester (75:25)
8	Status	Revised
9	To be implemented from Academic year	2021-2022

Preamble of the Syllabus:

Bachelor of Arts (B.A.) in Geography is a under graduation course of Department of Geography, Changu Kana Thakur Arts, Commerce & Science college, new Panvel (Autonomous) The Choice Based Credit and Grading System to be implemented through this curriculum would allow students to develop a strong footing in the fundamentals and specialize in the disciplines of his/her liking and abilities. This syllabus is prepared to give the sound knowledge and understanding of Geography to undergraduate students at first year of the B.A. degree course. The goal of the syllabus is to make the study of Geography as stimulating, interesting and relevant as possible. The syllabus is prepared by keeping in mind the aim to make students capable of studying Geography in academic and industrial courses. Also to expose the students and to develop interest in them in various fields of Geography. The new and updated syllabus is based on disciplinary approach with vigour and depth taking care of the syllabus is not heavy at the same time it is comparable to the syllabi of other universities at the same level. The students pursuing this course would have to develop understanding of various aspects of the Geography. The conceptual understanding, development of experimental skills, developing the aptitude for academic and professional skills, obtaining basic ideas and understanding of hyphenated techniques, understanding the fundamental Geographic processes and rationale towards application of Geographical knowledge are among such important aspects.

Objectives of the course:

1. To promote understanding of basic facts and concepts in Geography while retaining the excitement of Geography.
2. To make students capable of studying Geography in academic and Industrial courses.
3. To expose the students to various emerging new areas of Geography and apprise them with their prevalent in their future studies and their applications in various spheres of chemical sciences.
4. To develop problem solving skills in students.

Outcome of the course:

By the end of the course, a student should develop the ability:

- To understand, coherently and effectively about various genres of Geography.
- To develop the understanding and interest in the field of Geography
- To develop basic skills in practical Geography and its industrial applications.

Title of the Papers:**T. Y. B. A. Geography**

For the subject of Geography at third year level, there shall be six papers in each semester (Semester V and VI). Out of which for four papers are theory papers (Paper no. IV, V, VII and VIII) of 60 lectures each comprising of five units of 12 lectures. Paper No. VI and IX are Practical Component with 45 lectures each comprising of five units of 09 lectures.

Title of Papers with Course Code and Credit:**Semester-V**

Paper No.	Course Code	Title of the Papers	Credits
Iv	UAR5GE4	Geography of Settlements	04
V	UAR5GE5	Geography of Maharashtra	04
Vi	UAR5GE6	Tools and Techniques in Geography For Spatial Analysis-I (Practical)	03
Vii	UAR5GE7	Regional Planning and Development	04
Viii	UAR5GE8	Geography of Resources	04
Ix	UAR5GE9	Geospatial Technology	03

Semester-VI

Paper No.	Course Code	Title of the Papers	Credits
IV	UAR6GE4	Environmental Geography	04
V	UAR6GE5	Geography of Tourism and Recreation	04
VI	UAR6GE6	Tools and Techniques in Geography For Spatial Analysis-II (Practical)	03
VII	UAR6GE7	Economic Geography	04
VIII	UAR6GE8	Social Geography	04
IX	UAR6GE9	Research Methodology in Geography	03

Scheme of Examination for Each Semester:**Internal Evaluation: 25 Marks**

(20 marks for internal test and 05 marks for overall Performance)

Duration: 40 Minutes		Marks: 20
N.B. 1. All questions are compulsory and carry equal marks.		
Q. 1	A) Fill in the blanks /Choose the correct alternatives/ Match the pairs	05 Marks
	B) Define the terms/ Answer in one sentence	05 Marks
Q.2	Answer the following (Any Two out of three)	10 Marks

Semester End Examination: 75 Marks

Question Paper Pattern
For Revised Syllabus w.e.f. Academic Year, 2021-22 (CBSGS)
T.Y.B.A. Geography, Semester- V and VI

Duration: 2½ hours		Marks: 75
N.B. 1. All questions are compulsory and carry equal marks. 2. Use of Map Stencils and simple Calculator is allowed. 3. Attach appendix along with answer paper.		
Q. 1	Unit-I	15 Marks
<i>OR</i>		
Q.1	Unit-I (Question may be divided in to A and B)	15 Marks
Q. 2	Unit-II	15 Marks
<i>OR</i>		
Q. 2	Unit-II (Question may be divided in to A and B)	15 Marks
Q. 3	Unit-III	15 Marks
<i>OR</i>		
Q. 3	Unit-III (Question may be divided in to A and B)	15 Marks
Q. 4	Unit-IV	15 Marks
<i>OR</i>		
Q. 4	Unit-IV (Question may be divided in to A and B)	15 Marks
Q. 5	Unit-V	15 Marks
<i>OR</i>		
Q. 5	Unit-V (Question may be divided in to A and B)	15 Marks

Semester- V

Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)

T.Y.B.A. Geography (Semester - V)

Paper: IV : GEOGRAPHY OF SETTLEMENT

COURSE CODE: UAR5GE4

Credit: 04

UNIT – I: Introduction of Settlement Geography		No. of Lectures
1.1	Settlement geography: definitions, nature and scope	12
1.2	Importance of settlement studies in Geography	
1.3	Factors influencing growth and distribution of settlements	
1.4	Settlement types, their characteristics and differences	
UNIT – II: Geography of Rural Settlements		12
2.1	Origin and growth of settlements - evolution of rural settlements	
2.2	Site and situation of rural settlements	
2.3	Classification of rural settlements on the basis of population and patterns	
2.4	Classification of rural settlements on the basis of spacing and functions	
UNIT – III: Rural Settlements in India		12
3.1	Spatial distribution and density of rural settlements in India	
3.2	Structure of house and building materials in India	
3.3	Regional variations in rural settlement patterns in India	
3.4	Morphology of rural settlement in India	
UNIT – IV: Urban Settlements		12
4.1	Origin and growth of urban settlements	
4.2	Classification of urban settlements on the basis of culture and functions	
4.3	Hierarchy of Urban Settlement: Rank Size Rule and Primate city	
4.4	Christaller's Central Place Theory and Mark Jefferson's Theory	
UNIT – V: Urban Settlements in India		12
5.1	Urbanization in India: Trends, patterns and types of towns based on Census	
5.2	Morphology of urban settlements in India (With reference to a port and inland city)	
5.3	Impact of urbanization on Indian cities	
5.4	Smart city: Concept, need and implementation in India	

References:

- Deshpande, C. D. (2005): "Cities: A Geographical Study", Translated by V. G. Amrite, Manan Prakashan, Mumbai
- Gharpure, V. (2013): "Nagari Bhugol", (Marathi) Pimpalpure and Company Publishers, Nagpur
- Gharpure, V. (2013): "Vasti Bhugol", (Marathi) Pimpalpure and Company Publishers, Nagpur
- Gharpure, V. (2017): "Manavi Bhugol", (Marathi) Pimpalpure and Company Publishers, Nagpur
- Ghosh. S. (2015): "Introduction to Settlement Geography", Orient Blackswan Private Limited, Hyderabad
- Jyptirmoy Sen (2007): "A Text Book of Social and Cultural Geography," Kalyani Publsiher, New Delhi.
- Knowles, R and Wareing, J. (1996): "Economic and Social Geography", the Made Simple Series, Rupa & Co., Calcutta
- Leong, Goh-Cheng and Morgan, G. (1994): "Human and Economic Geography", Oxford University Press, Oxford
- Noble, A. (1998): "Using Descriptive Models to Understand South Asian Cities", *Education About Asia*, Vol. 3, No. 3, Downloaded from <http://aas2.asian-studies.org/EAA/EAA-Archives/3/3/205.pdf>
- Siddhartha, K and Mukherjee, S. (2016): "Cities, Urbanisation and Urban Systems (Settlement Geography)", KitabMahal, Allahabad
- Singh, L. R. (2009): "Fundamentals of Human Geography", Sharda Pustak Bhawan, Allahabad
- Singh, R. Y. (2012): "Geography of Settlements", Rawat Publications, Jaipur
- Tiwari, R. C. (2016): "Geography of India", Pravalika Publications, Allahabad
- Thakur S. A. and others – "Settlement Geography"/ *Vasti Bhugol*- Konkan Geographers, Publication (2012)
- घारपुरे वळूर (१९९९)ळस्ती भोर, वपपलापुरे अड किं.,नागप
- साळिंत प्रकाळ (१९९८) नागरी भूगोर, फडके प्रकाळन, कोल्हाप
- सळदी ए.बी. (२०१०) नागरी भोर, मनरारी प्रकाळन, पुणे

Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)

T.Y.B.A. Geography (Semester - V)

Paper: V-A: GEOGRAPHY OF MAHARASHTRA

COURSE CODE: UAR5GE5

Credit: 04

Unit-I: Maharashtra: Geographical Setting		No. of Lectures
1.1	Location, extent and boundaries	12
1.2	Administrative setup and divisions	
1.3	Physiography and climate	
1.4	Drainage system	
Unit-II: Natural Resources		12
2.1	Soils	
2.2	Natural vegetation	
2.3	Minerals	
2.4	Energy resources	
Unit-III: Human Resources		12
3.1	Population growth	
3.2	Distribution –urban-rural and population density	
3.3	Structure of population : Age-sex, literacy and dependency Ratio	
3.4	Occupational structure of population	
Unit-IV: Agriculture, Fishing and Livestock Resources		12
4.1	Salient features of agriculture	
4.2	Agricultural regions, recent issues and policies	
4.3	Fisheries, recent issues and policies	
4.4	Livestock resources recent issues and policies	
Unit-V: Industries, Trade and Transport		12
5.1	Role of transport in industrial development	
5.2	Major industrial regions	
5.3	Industrial issues and policies	
5.4	Transport and trade	

References:

- Jaymala Diddee, S.R. Jog, V.S. Kale Geography of Maharashtra
- Johns: Economic Geography -
- Khullar: Geography of India
- Majid Hussein: Geography of India
- Oxford: Oxford School atlas-
- Savinder Singh Environmental Geography
- Sharma: India's economic and commercial geography
- प्रा.सवदी: महाराष्ट्राचा भूगोल
- देशपांडे एस.एस: महाराष्ट्राचे अर्थशास्त्र
- महाराष्ट्राचा भूगोल - प्रा.सी.डी देशपांडे
- महाराष्ट्र- सवदी आणण के चे
- महाराष्ट्राचा भूगोल - बी.अरूणाचरम
- महाराष्ट्र 2006 – सांतोष दास्ताने
- जनगणना अँटर्स – महाराष्ट्र सरकार
- महाराष्ट्राचनकाशे – डॉ.के.आर.दत्त
- महाराष्ट्रातील जलसांपदा- प्रा. डॉ.एस.व्ही.ढमढेरे
- महाराष्ट्रातील नद्या – श्रीकांत तापीकर
- महाराष्ट्राचा भूगोल – डॉ.स.श. फुले

Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)**T.Y.B.A. Geography (Semester - V)****Paper: V-B : POPULATION GEOGRAPHY****COURSE CODE: UAR5GE5****Credit: 04**

UNIT- I: Introduction to Population Geography		No. of Lectures
1.1	Concept, definition, nature, scope, importance	12
1.2	Evolution and recent trends	
1.3	Basic sources of population data and their important elements	
1.4	Population Geography and other Social Sciences	
UNIT- II: Population Dynamics		12
2.1	Population growth in the world (continent wise and level of development)	
2.2	Population growth in India	
2.3	World : Population density and its determinants	
2.4	Structure of population in developed and developing world (Age and Sex, Rural and Urban)	
UNIT- III: Theories of Population Growth		12
3.1	Demographic Transition Model	
3.2	Malthu's Population Theory	
3.3	Leibenstein's motivational theory of population growth	
3.4	Theory of optimum population	
UNIT- IV: Migration		12
4.1	Definition and Classification of Migration	
4.2	Causes and Consequences of Migration	
4.3	Recent trend of migration in India	
4.4	Issues of infiltration and its impacts in India	
UNIT- V: Contemporary Issues		12
5.1	Ageing population	
5.2	Gender issues -declining sex ratio, literacy gap,	
5.3	Poverty and unemployment in India	
5.4	Rapid urbanization in India	

Reference:

- Bhende A. and Kanitkar T.,(2000):*Principles of Population Studies*, Himalaya Publishing House
- Chandna R.C. and Sidhu M.S., 1980: *An Introduction to Population Geography*, Kalyani Publishers
- Chandna, R C (2006), *Jansankhya Bhugol*, Kalyani Publishers, Delhi
- Chandna, R C (2014),: *Geography of Population: Concepts, Determinants and Patterns*, Kalyani Publishers, Delhi
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- Roy. D. (2015) *Population Geography*, Books & Allied Publication, Kolkata

Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)

T.Y.B.A. Geography (Semester - V)

Paper No: VI: TOOLS AND TECHNIQUES IN GEOGRAPHY FOR
SPATIAL ANALYSIS-I (Practical)

COURSE CODE: UAR5GE6

Credit: 03

Unit –I: Map Projections		No. of Lectures
1.1	Basic Concepts – Definition, scale, direction, azimuth, graticule, great circle, true meridian, types of projections, choice of projections	09
1.2	Zenithal Polar Projections – Equal Area, Equidistant	
1.3	Cylindrical Projections - Equal Area, Equidistant	
1.4	Conical Projections - One standard parallel, two standard parallel	
Unit-II: Elements of Map		09
2.1	Basic elements of map and identification of relief, bearing and distance	
2.2	Area calculation with square method, strip method and triangulation method	
2.3	Delineation of watershed on topo sheet and preparation of drainage map	
2.4	Longitudinal profile of river	
Unit-III: Survey of India Toposheets		09
3.1	Introduction and indexing of SOI Topo sheets, Signs and symbols and marginal information	
3.2	Study of physiography, drainage and vegetation (one full topo sheet of hilly and plateau region each)	
3.3	Study of settlements – size, pattern, utilities (one full topo sheet of plains and urban region each)	
3.4	Study of transport and communication network and economic activities (one full topo sheet of plains and urban area each)	
Unit IV: Preparation of Thematic maps (Conventional method)		09
4.1	Preparation of thematic maps with actual data- Dot and Pictogram	
4.2	Preparation of thematic maps with actual data- Choropleth and Isopleth	
4.3	Preparation of thematic maps with actual data- Located bar, located circle and pie chart	
Unit-V: Use of computers in geographical data representation		09
5.1	Use of MS Word and MS Power Point in Geography	
5.2	Construction of line graphs & simple, multiple bar graphs, divided bar graphs, and pie charts using MS-excel	
5.3	Preparation of datasheet in SPSS	
5.4	Calculation of central tendency and standard deviation using SPSS	

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Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)**T.Y.B.A. Geography (Semester - V)****Paper: VII: REGIONAL PLANNING AND DEVELOPMENT****COURSE CODE: UAR5GE7****Credit: 04**

UNIT – I: Understanding Regional Planning		No. of Lectures
1.1	Planning: Concept, types and need	12
1.2	Regional planning: Concept, nature, relation with Geography	
1.3	Role of surveys and geospatial technology in regional planning	
1.4	Problems associated with regional planning	
UNIT – II: Concept of Region in Planning		12
2.1	Region: Concept, types and delineation	
2.2	Planning Regions: Need, characteristics and hierarchy	
2.3	Demarcation of planning regions: Principles, criteria and methods	
2.4	Perroux's Growth Pole Theory and regional planning	
UNIT – III: Understanding Regional Development		12
3.1	Development: Concept and indicators	
3.2	Regional disparities in development: Concept and measurements	
3.3	Spatial and Non-Spatial Models of Development with Special Reference to Rostow's Model and Myrdal's Model	
3.4	Strategies for regional development	
UNIT – IV: Regional Planning in India – I		12
4.1	Five-Year Plans: Features, achievements and failure	
4.2	Multi-level planning in India	
4.3	Planning regions of India	
4.4	Changing planning mechanism of India: NITI Ayog	
UNIT – V: Regional Planning in India – II		12
5.1	Micro level planning in rural area	
5.2	Backward area development programme	
5.3	Urban fringe of Indian cities: Problems and planning	
5.4	Metropolitan Planning: A Case of Mumbai Metropolitan Region	

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Books for further reading:

- Bhargava, G. (2001): “Development of India’s Urban, Rural, and Regional Planning in 21st Century: Policy Perspective”, Gyan Publishing House, Delhi
- Datt, G. And Mahajan, A. (2016): “Datt and Sundaram’s Indian Economy”, S. Chand Publishing, New Delhi
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IMPORTANT WEBSITES / WEB LINKS:

mmrda.maharashtra.gov.in

niti.gov.in

planningcommission.gov.in

yojana.gov.in

Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)**T.Y.B.A. Geography (Semester - V)****Paper: VIII - A: GEOGRAPHY OF RESOURCES****COURSE CODE: UAR5GE8****Credit: 04**

UNIT – I: Introduction to the Resources		No. of Lectures
1.1	Meaning and importance of the natural resources	12
1.2	Factors influencing resource utilization	
1.3	Classification of resources	
1.4	Issues with renewable and non-renewable resources	
UNIT – II: Need for Sustainable use of Natural resources		12
2.1	Over exploitation and depletion of natural resources	
2.2	Resource consumption pattern in the developed, developing and less developed countries	
2.3	Need and measures for resource conservation	
2.4	Sustainable use of natural resources	
UNIT – III: Natural Resources, Part –I		12
3.1	Distribution of water resources on the Earth	
3.2	Water consumption pattern, water pollution and water conservation	
3.3	Distribution of forest resources in the world	
3.4	Depletion of forest and forest conservation	
UNIT – IV: Natural Resources Part –II		12
4.1	Soil composition and factor affecting pedogenesis processes	
4.2	Soil degradation and its conservation	
4.3	Minerals and their classification	
4.4	Utilization of energy minerals, issues and need conservation	
UNIT – V: Human Resources		12
5.1	Concept of human resource: skilled and unskilled workers	
5.2	Distribution of population in the world	
5.3	Concept of over, under and optimum population	
5.4	Population Resource regions	

References:

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3. GautamAlka: 2013: Advanced Economic Geography, Sharda Pustak Bhawan, Allahabad, India, Third Edition
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Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)**T.Y.B.A. Geography (Semester - V)****Paper: VIII-B : GEOGRAPHY OF HEALTH****COURSE CODE: UAR5GE8****Credit: 04**

Unit I - Introduction to Geography of Health		No. of Lectures
1.1	Nature, scope and evolution Geography of health	12
1.2	Conceptual background and components Geography of health	
1.3	Significance and approaches Geography of health	
1.4	Relation of Geography of health with other branches of social science	
Unit- II -The Pollution Syndrome		12
2.1	Air Pollution: Causes, Effects and remedial measures	
2.2	Water Pollution: Causes, Effects and remedial measures	
2.3	Radioactive Pollution: Causes, Effects and remedial measures	
2.4	Plastic Pollution: Causes, Effects and remedial measures	
Unit III - Geography of Diseases		12
3.1	Weather-related diseases and climate change and Global health	
3.2	Types of diseases and their regional pattern	
3.3	Case studies of communicable diseases - malaria and HIV Aids	
3.4	Case studies of non-communicable diseases - cancer and malnutrition	
Unit IV -Health and Environment		12
4.1	Linkages of health with environment	
4.2	Relation between development and health	
4.3	Population dynamics, urbanization, poverty and inequality	
4.4	Migration and related health issues	
Unit V - Health Care Facilities		12
5.1	Health care facilities in India	
5.2	Spatial Distribution of health care facilities in Maharashtra	
5.3	Health care policies in India	
5.4	Health Organisations: WHO, UNISEF, Red Cross Society and NGOs	

References

1. Alice E. Marczewski and Michael Kamrin: Toxicology for the Citizen.
2. B. Brockband, J.Cohrsson, and V.T. Covello: The Risk Assessment Manual: A Guide to Understanding and Using Health and Environmental Assessments
3. Marilyn O. Ruiz: Geography of Disease
4. Michael Emch, Elisabeth Dowling Root, and Margaret Carrel: Health and Medical Geography Fourth Edition
5. Rhonda Humbird: AP Environmental Science - Part 1: The Living World

Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)**T.Y.B.A. Geography (Semester - V)****Paper: VIII-C: GEOGRAPHY OF DISASTER MITIGATION
AND MANAGEMENT****COURSE CODE: UAR5GE8****Credit: 04**

UNIT – I, Meaning & Concept of Disaster & Hazard		No. of Lectures
1.1	Concepts of Disaster, Hazard, Vulnerability and Risks	12
1.2	Typology of hazards & Disasters- Natural Disasters & Man-made Disasters	
1.3.	Impacts of Disasters – Socio–economic and political	
1.4.	Need of Disaster Management in India	
UNIT – II, Elements of Disaster Management		12
2.1.	Disaster Management : Meaning & Concept	
2.2.	Role of International Organizations for Disaster Management – UNISDR, INSARAG, Red Cross	
2.3	Role of National Organizations for Disaster Management	
2.4	Role of NGOs & Community in Disaster Management	
UNIT – III, Disaster Management : Methods & Approaches		12
3.1	Disaster Management : Historical Perspective	
3.2	Disaster Management : Methods & Approaches	
3.3	Pre- Disaster Stage of Management	
3.4	Post- Disaster Stage of Management	
UNIT- IV, Natural Disaster and its Management in India		12
4.1	Earthquake & Tsunami – Areas of occurrence, Causes, Effects, Management	
4.2	Flood – Areas of occurrence, Causes, Effects , Management	
4.3	Cyclone – Areas of occurrence, Causes, Effects , Management	
4.4	Famine – Areas of occurrence, Causes, Effects , Management	
UNIT –V, Anthropogenic Disaster and its Management in India		12
5.1	Industrial Hazards – Causes, effects and management with reference to Bhopal Gas Tragedy	
5.2	Terrorism – Causes, effects and management with reference to 26/11 Mumbai attack	
5.3	Wild Fire – Types, Causes, effects and management with reference to Uttarakhand forest fire 2016	
5.4	Accidents - Causes, effects and management with reference to Savitri river bridge collapse accident August 2016	

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Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)

T.Y.B.A. Geography (Semester - V)

Paper – IX: GEOSPATIAL TECHNOLOGY

Course Code: UAR5GE9

Credit- 03

UNIT - I	Remote Sensing – I	No. of Lectures
1.1	Geospatial Technology: Concept, Components and Importance	09
1.2	Remote Sensing: Concept, Types , Process and Geographical Applications	
1.3	Electromagnetic Energy, EMR and EMS – Effects of Atmosphere on EMR , Spectral Reflectance and Spectral Signature or Curve - Platforms, Sensors and Resolution	
1.4	Elements of Visual Image Interpretation - Mapping of Thematic Layers and Visual Image Interpretation of Physical and Manmade Features	
UNIT - II	Remote Sensing – II	09
2.1	Concept of DEM, Digital image analysis: landuse and landform classification, 3D view of DEM	
2.2	Aerial Photographs: Concept, Process and Types	
2.3	Interpretation of Aerial Photographs	
2.4	Advanced Remote Sensing Technology - Use of Bhuvan website	
UNIT - III	Global Positioning System	09
3.1	GPS : Concept, Segments, Applications	
3.2	Types of GPS – GPS Data Accuracy and Errors	
3.3	Factors Affecting GPS Data - Global Navigation System	
3.4	Ground Survey and Demarcation of Point, Line and Polygon Features with GPS Device – Transfer GPS Data to Computer with Software's like Easy GPS	
UNIT - IV	Geographic Information System – I	09
4.1	GIS : Concept, Components and Applications - Map Projection and Coordinate System	
4.2	GIS Data Sources and Types	
4.3	Use of Image/map into GIS Software and Geo-referencing	
4.4	Creating Layers by Digitization of Point, Line and Polygon Features	
UNIT V	Geographic Information System – II	09
5.1	Functions of Database Creation – Input, Editing and Linking	
5.2	Spatial Database Analysis: Overlay, Merge, Query	
5.3	Map compositions for Map Layout and Design	
5.4	Preparation of Thematic Maps	

References:

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Semester- VI

Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)

T.Y.B.A. Geography (Semester - VI)

Paper: IV: ENVIRONMENTAL GEOGRAPHY

COURSE CODE: UAR6GE4

Credit: 04

UNIT -I	Introduction to Environmental Geography		No. of Lectures
	1.1	Environmental Geography: Definition, Nature, Scope and Importance	12
	1.2	Environment: Meaning, Components and Types	
	1.3	Approaches to the Study of Man – Environment Relationship (Determinism, Possibilism, Probabilism, Stop and Go determinism)	
	1.4	Changing Man - Environment Relationship in a Historical Perspective	
UNIT-II	Ecosystem		12
	2.1	Meaning and Structure of Ecosystem	
	2.2	Ecological Pyramids and Productivity of Ecosystem	
	2.3	Functions of Ecosystem: Food Chain & Web, Energy Transfer, Biogeochemical Cycles	
	2.4	Types of Ecosystems: Aquatic, Terrestrial, and Aqua-Terrestrial Ecosystems	
UNIT-III	Biodiversity		12
	3.1	Biodiversity: Concept, Types and Distribution	
	3.2	Biodiversity Hotspots: Concept, and Distribution in India with Special Reference to Western Ghats	
	3.3	Threat to Biodiversity: Causes and consequences	
	3.4	Conservation of Biodiversity and Policies of Indian Government	
UNIT-IV	Environmental Challenges in India		12
	4.1	Air pollution and Water Pollution: Causes, consequences and measures	
	4.2	Land and Noise Pollution: Causes consequences and measures	
	4.3	Environmental Issues Related to Big Dams	
	4.4	Major environmental Movements in India	
UNIT-V	Sustainable Development and Environmental Management		12
	5.1	Environmental Management and Environmental Impact Assessment	
	5.2	Concepts and Need of Sustainable Development and goals for Environmental Management	
	5.3	Need of Environmental Education and Eco-friendly Lifestyle	

5.4

Biosphere Reserves and Wildlife Management in India

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Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)

T.Y.B.A. Geography (Semester - VI)

Paper No: VI-A : GEOGRAPHY OF TOURISM and RECREATION COURSE

CODE: UAR6GE5

Credit: 04

Unit-I: -Introduction to Tourism Geography		No of Lectures
1.1	Definition , Nature and Scope	12
1.2	Types of Tourism	
1.3	Components of Tourism - Geographical and economical components	
1.4	Components of Tourism - Socio-cultural and political components	
Unit-II: Types & Impact of Tourism		12
2.1	New Trends in Tourism (World, India and Maharashtra)	
2.2	Trends of Tourism Development in World	
2.3	Impact of Tourism on Environment- Environmental and economical	
2.4	Impact of Tourism on Socio-cultural and political components	
Unit-III: – Role of Infrastructure and Technology in Tourism Development		12
3.1	Accommodation and food services	
3.2	Transportation	
3.3	Travel Agencies and Tour Guide	
3.4	Documentation and Ticketing	
Unit-IV: - Planning of Tourism and Tourism Organizations		12
4.1	Need of Planning and Elements of Planning	
4.2	Levels of Planning	
4.3	Tourism Organizations - IATA, PATA, I.T.D.C. and M.T.D.C	
4.4	Incredible India campaign	
Unit-V: Tourism Potential and Tourism Policy in Maharashtra		12
5.1	Coastal tourism in Maharashtra	
5.2	Adventure tourism in Sahyadri	
5.3	Heritage tourism in Maharashtra	
5.4	Tourism Policy of Maharashtra State	

• **References:**

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2. Bhatia A.K., Tourism Development, Sterling Publishers Pvt. Ltd. New Delhi.
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Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)**T.Y.B.A. Geography (Semester - VI)****Paper No.: V –B: POLITICAL GEOGRAPHY****COURSE CODE: UAR6GE5****Credit: 04**

Unit – 1. : Introduction of Political Geography		No of Lectures
1.1	Definition, Nature and Scope of Political Geography	12
1.2	Historical Development and Recent Trends in Political Geography	
1.3	Concept of state and factors	
1.4	Concept of Nation, Nation-State, and Nationalism	
Unit – 2. : Approaches and Concepts in Political Geography		12
2.1	Hartshorne’s Fundamental Approach: Centrifugal and Centripetal Forces	
2.2	Unified Field Theory	
2.3	Core Areas: Concept, Characteristics, and Distribution	
2.4	Capitals: Concept, Functions, and Classification	
Unit – 3. : Frontiers and Boundaries		12
3.1	Frontiers and Boundaries: Concepts and Distinction	
3.2	Functions of Frontiers and Boundaries	
3.3	Classification of Boundaries	
3.4	India’s Boundaries: Characteristics and Disputes	
Unit – 4. : Geostrategic and Geopolitical Views		12
4.1	Mackinder’s Heartland and Spykman’s Rimland Theory	
4.2	Geopolitics of Indian Ocean	
4.3	Geopolitics of International Water Disputes with Special Reference to India	
4.4	Changing Political Map of India	
Unit – 5. : Electoral Geography		12
5.1	Concept, Nature and Approaches of Electoral Geography	
5.2	Geography of Voting: Geographical Factors Affecting Elections	
5.3	Spatial Organization of Electoral Areas and Geography of Representation	
5.4	Challenges to Election System in India	

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Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)

T.Y.B.A. Geography (Semester - VI)

Paper No: VI: TOOLS AND TECHNIQUES IN GEOGRAPHY FOR SPATIAL
ANALYSIS-II (Practical)

COURSE CODE: UAR6GE6 Credit: 03

Unit – I: Nature of data and Measures Central Tendency		No. of Lectures
1.1	Meaning and types of data, variable, observation, observation value, simple, discrete data and continuous data	09
1.2	Frequency Distribution, Histogram, Frequency Polygon and Ogive curve	
1.3	Measures of Central Tendency- mean, median and mode	
Unit –II: Measures of Dispersion and Deviation		09
2.1	Mean Deviation and Quartile Deviation	
2.2	Standard Deviation and Variance	
2.3	Time Series Analysis Moving Averages (3 years and 5 years)	
Unit –III: Correlation, Regression & Hypothesis Testing		09
3.1	Calculation of correlation coefficient - Pearson's and Spearman's methods	
3.2	Regression analysis	
3.3	Chi square test	
Unit-IV: Sampling Techniques		09
4.1	Sample design in Geography	
4.2	Point sampling – Linear , random and stratified	
4.3	Line sampling – Stratified and random	
4.4	Area sampling – Quadrant and random	
Unit-V: Field work in Geography of any Rural and Urban one place/village		09
5.1	Collection of physiographic data – Field observation, field sketching, collection of soil and rock samples, identification of vegetation etc.	
5.2	Collection of socio-economic data – interviews, questionnaire survey, visit to local governing office, NGO's etc	
5.3	Collection of geospatial data – toposheets, aerial photographs, Google images/maps, Bhuvan images etc.	
5.4	To prepare a geographical report of a place using the base of available 5.1, 5.2, and 5.3 aspects	
	Field Trip	

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Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)

T.Y.B.A. Geography (Semester - VI)

Paper – VII: ECONOMIC GEOGRAPHY

COURSE CODE: UAR6GE7

Credit: 04

Units	Name of the Unit/Subunit	No of Lectures
Unit – 1: Introduction of Economic Geography		
1.1	Definition, Nature and Scope	12
1.2	Branches of Economic Geography	
1.3	Approaches to study Economic Geography and Relation with other social sciences	
1.4	Resources: Concept, Classification and Importance in Economy	
Unit – 2: Economic Activities		
2.1	Economic Activities: Type and Characteristics	12
2.2	Factors Affecting Economic Activities	
2.3	Agriculture and Lumbering: Types and Distribution	
2.4	Fishing and Animal Husbandry: Types and Distribution	
Unit – 3: Minerals and Industries		
3.1	Minerals: Importance, Characteristics and Distribution of Iron Ore, Manganese, Coal and Mineral Oil and other important minerals	12
3.2	Factors Affecting Industrial Locations	
3.3	Weber's Industrial Location Theory	
3.4	Major Industrial Regions of the World	
Unit – 4: Transport and International Trade		
4.1	Transportation: Importance and influencing factors	12
4.2	Major Transport Patterns in the World	
4.3	Patterns of International Trade: Composition and Direction	
4.4	Major International Trade Organizations: WTO, OPEC, SAARC, G-20 and BRICS	
Unit – 5 : Economic Development of India		
5.1	Regionalization of India based on Levels of Economic Development	12
5.2	Globalization and its impact on Indian economy	
5.3	Special Economic Zones	
5.4	Issues related to Environment Economic Development in India	

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Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)**T.Y.B.A. Geography (Semester - VI)****Paper: VIII -A : BIOGEOGRAPHY****COURSE CODE: UAR6GE8****Credit: 04**

Unit-I: Introduction to Biogeography		No, of Lectures
1.1	Concept, definition, nature and scope	12
1.2.	Historical development and branches of Biogeography	
1.3.	Approaches to study Biogeography	
1.4.	Importance of Biogeographic studies	
Unit-II: Ecosystem and Biosphere		12
2.1.	Ecosystem: Concept, meaning and types	
2.2.	Components of ecosystem and ecosystem productivity	
2.3.	Biosphere: Concept, meaning and components	
2.4.	Biogeographic processes	
Unit -III: Plant Community		12
3.1.	Concept of plant community and classification of plants	
3.2.	Biotic succession and climax vegetation	
3.3.	Major plant formation and biomes- Tropical	
3.4.	Major plant formation and biomes- Temperate	
Unit –IV: Marine Biogeography		12
4.1.	Marine Biogeography meaning and concept	
4.2.	Types of ocean habitats	
4.3.	Biogeography of estuaries	
4.4.	Island biogeography	
Unit-V: Biodiversity		12
5.1.	Meaning and types of Biodiversity	
5.2.	Importance of Biodiversity	
5.3.	Causes of Biodiversity loss	
5.4	Biodiversity conservation	

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Revised Syllabus w.e.f. Academic Year 2021-22 (CBSGS)**T.Y.B.A. Geography (Semester – VI)****Paper VIII-B: SOCIAL GEOGRAPHY****COURSE CODE: UAR6GE8****Credit: 04**

UNIT – I: Introduction to Social Geography		TOTAL LECTURES
1.1	Definitions, Nature, Scope and importance	12
1.2	Branches and Approaches in Social Geography	
1.3	Concept of Social Space and Socio-cultural Regions	
1.4	Globalization: The Process of Social and Spatial Change	
UNIT – II: Elements of Social Geography -World		12
2.1	Race: Concept and Basis of Classification and distribution	
2.2	Religion: Characteristics, Distribution of Major Religions in the World	
2.3	Language: Characteristics and Distribution of Major Linguistic Families in the World	
2.4	Tribes: Concept, Characteristics and Distribution of Major Tribes in the World	
UNIT – III: : Elements of Social Geography –India		12
3.1	Race: Major races and its distribution in India	
3.2	Religion: Major Religions and its distribution and its distribution in India	
3.3	Language: Major Linguistic Families in India	
3.4	Tribes: Distribution of Scheduled Tribes in India	
UNIT – IV Contemporary Issues in India		12
4.1	Religion related social issues	
4.2	Language related social issues	
4.3	Patterns of gender issues in India	
4.4	Socio-economic problems of indigenous communities in India	
UNIT – V: Contemporary Social welfare policies of Government of India		12
5.1	Religion related Policy	
5.2	Language related Policy	
5.3	Gender related Policy	
5.4	Policy related to indigenous communities in India	

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Revised Syllabus w.e.f. Academic Year, 2021-22 (CBSGS)**T.Y.B.A. Geography (Semester – VI)****Paper: VIII-C: GEOGRAPHY OF TRANSPORT****COURSE CODE: UAR6GE8****Credit: 04**

Unit-I : Introduction to Transport Geography		No. of Lectures
1.1	Concept and Definition of Geography of Transport	12
1.2	Nature and Scope Geography of Transport	
1.3	Definition of Distance and its types, Factors affecting on Transportation	
1.4	Significance of the study of Geography of Transport	
Unit-II – Transport network system		12
2.1	Transport network system – structure and properties	
2.2	Application of graph theory measures	
2.3	Location of routes and efficiency of network	
2.4	Conflicting aspects of decision making	
Unit-III : Evolution of Modes of Transport		12
3.1	Evolution of transport network and their environment	
3.2	Phases of growth and development of different modes of transport	
3.3	Factors influencing comparative cost structures and locational responses	
3.4	Global patterns of land, water and air transports	
Unit-IV : Theoretical Framework of Transport		12
4.1	Connectivity and its Measurement	
4.2	Accessibility and its Measurement	
4.3	Taffe's model	
4.4	Gravity model	
Unit-V: Transportation Issues in India		12
5.1	Issues associated with roadways transport network	
5.2	Issues associated with railways transport network	
5.3	Issues associated with water transport development	
5.4	Issues associated with air transport development	

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Revised Syllabus w.e.f. Academic Year, 2021-22 (CBSGS)

T.Y.B.A. Geography (Semester – VI)

Paper: IX: RESEARCH METHODOLOGY IN GEOGRAPHY

COURSE CODE: UAR6GE9

Credit: 03

UNIT I	Research Methodology in Geography	No. of Lectures
1.1	Research in Geography: Concept, Classification , Steps and Significance Review of Literature	
1.2	Research Methodology: Meaning and Types (Qualitative and Quantitative)	
1.3	Defining the Research Problem: Meaning, Need and Techniques	
1.4	Research Designs: Concept, Need and Objectives	
UNIT II	Data Collection and Processing	09
2.1	Sample Design, Measurement and Scaling	
2.2	Data Collection in Geography: Types (Primary and Secondary) and Methods (Observation, Questionnaire, Schedule, Interview, etc.)	
2.3	Role of Internet in Research: Online Research Referencing (Shodhganga, INFLIBNET, Research Gate, Academia, Mendeley, etc.)	
2.4	Data Processing: Editing, Coding, Classification and Tabulation	
UNIT III	Data Analysis	09
3.1	Data Analysis: Meaning, Significance and Types	
3.2	Using MS-Excel and SPSS for Data Analysis: Graphical, Descriptive and Inferential Statistical Representation	
3.3	Hypothesis: Meaning, Types, Levels of Significance, Degrees of Freedom and Errors	
3.4	Statistical Techniques for Hypothesis Testing	
UNIT IV: Digital Data Analysis and Research Report Writing		09
4.1	Techniques of Spatial and Non-spatial data Analysis in GIS Software's (Q-GIS/ Gramm ++)	
4.2	Techniques of Data Analysis in Satellite Image Processing Software's(SAGA)	
4.3	Basics of Research Report Writing: Layout, Structure, Language, Bibliography, References and Footnotes	
4.4	Ethics in Research	
UNIT V	Preparation of Research Report	09
5.1	Research Report on any One Theme in Physical Geography or Human Geography by following the all steps of Research	

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NEW PANVEL (AUTONOMOUS)**

**Re-accredited 'A+' Grade by NAAC
'College with Potential for Excellence' Status Awarded by UGC
'Best College Award' by University of Mumbai**

Program: B.A

**Revised Syllabus of T.Y.B.A. History
Choice Based Credit & Grading System (75:25)
w.e.f. Academic Year 2021-22**

Sr. No.	Heading	Particulars
1	Title of Course	History
2	Course Code	SEMESTER-V UAR5HS4 ,UAR5HS5, UAR5HS6 ,UAR5HS7, UAR5HS8, UAR5HS9 SEMESTER-VI UAR6HS4 ,UAR6HS5, UAR6HS6 ,UAR6HS7, UAR6HS8, UAR6HS9
3	Eligibility for Admission	SYBA With History as one of the subject
4	Passing marks	40%
5	Ordinances/Regulations (if any)	
6	No. of Semesters	Two
7	Level	U.G.
8	Pattern	Semester (75:25)
9	Status	Revised
10	To be implemented from Academic year	2020-2021

Preamble of the Syllabus:

The Department of History was established in Changu Kana Thakur Arts, Commerce and Science College (Autonomous), New Panvel; in 22nd September 1997-98. Since its inception, along with academics, it has excelled in establishing Co-Curricular and extracurricular activities. The T.Y.B.A. Course is designed according to Choice Based Credit and Grade System. To understand the background of social, economic, religious, cultural and political life of people and compare it with present to achieve overall development of society through the History Paper of Medieval India and History of Marathas. Students will acquire a deep and more preclusive understanding of changes, personality and themes in Modern Indian History, while studying the History of Contemporary World; one can compare the impact of the World War First and World War Second on the Asian Continent. Archaeology and Research Methodology this Papers provides Career Opportunities by creating interest in historical research. The History Course is applicable. The revise syllabus are based on the various approaches, strengthening, National Integration and harmony as well as generates the felling of Nationalism and Patriotism of T.Y.B.A. History Course.

Course Code -UAR5HS4 / UAR6HS4

Course Title-History of Medieval India

Course Title-History of Medieval India

Academic Year: 2021-22

Objectives:

1. To acquaint the students with the history of early Medieval India that laid the foundation of the Sultanate in India.
2. To examine the administrative, socio-economic and cultural aspects of Medieval India.
3. To understand administration of the Mughal Empire.
4. To study the rise of the Maratha Power.

Course Outcome:

1. Students can study the socio-economic, cultural and political contribution of Medieval India.
2. In the curriculum of the Medieval India, students get guidance from within the workings of the rulers.
3. Learner will be understood the origin and growth of regional empire.
4. To study the impact on Medieval Indian Society and Polity.

T.Y.B.A. History

For the Subject of History there shall be two papers for 45 lectures each semester.

SEMESTER-V

History of Medieval India (1000 CE-1526CE)

Module I will be Foundation, Expansion and Decline of Delhi Sultanate

Module II will be Administrative Structure of the Sultanate

Module III will be Emergence of Vijaynagar and Bahamani Kingdoms

Module IV will Society, Economy, Religion and Culture of Delhi Sultanate

SEMESTER -VI

History of Medieval India (1526 CE-1707CE)

Module I will be Foundation, Expansion and Decline of the Mughal Rule

Module II will be Administrative Structure of the Mughals

Module III will be Rise of the Maratha Power

Module IV will be Society and Economy, Religion and Culture of the Mughal Rule

Course Code-UAR5HS5 / UAR6HS6

Course Title - History of Modern Maharashtra (1818 CE-1960 CE)

Course Title - History of Contemporary India (1947 CE- 2000 CE)

Academic Year- 2021-22

Objectives:

1. To acquaint students with regional history.
2. To understand political and socio-economic developments during the 19th and 20th centuries.
3. To understand the process of making the Constitution and the Integration and Reorganization of Indian States.
4. To comprehend the socio-economic changes and progress in science and technology in India.

Course Outcomes:

1. Learners will acquaint a deeper and more inclusive understanding of landmarks events, personality.
2. The students can study the movements of the 19th century.
3. To explain to the learners how socio-economic development took place in the History course of Contemporary India.
4. Understanding the major trends of Modern India to the Learners.

T.Y.B.A. History

For the Subject of History there shall be two papers for 45 lectures each semester.

SEMESTER -V

History of Modern Maharashtra (1818 CE-1960 CE)

Module I will be Beginning of the British Rule

Module II will be Socio- Economic Awakening

Module III will be Political Developments in Maharashtra (1885-1960)

Module IV will be Emergence of New Forces

SEMESTER -VI

History of Contemporary India (1947 CE- 2000 CE)

Module I will be The Nehru Era (1947 CE – 1964 CE)

Module II will be Political, Social and Economic Developments (1964CE–1984 CE)

Module III will be Political, Social and Economic Developments (1984 CE – 2000 CE)

Module IV will be Emerging Trends

Course Code- UAR5HS6 / UAR6HS6
Course Title – Introduction to Archaeology
Course Title- Introduction to Museology and Archival Science

Academic Year: 2021-22

Objectives:

1. To understand the basic facets of Archaeology.
2. To study the importance of Numismatics as an important source of history.
3. To understand the importance of Archival Science in the study of History.
4. To encourage students to pursue careers in various Museums and Archives in India and abroad.

Course Outcomes:

1. The learners will acknowledge about Archeology and its importance in History.
2. They will know opportunities in field of Archeology.
3. The students will get encourage to pursue careers in the field of Museology.
4. They will Know Archaeology as well as understand the glorious cultural development and scope and value.

T.Y.B.A. History

For the Subject of History there shall be two papers for 45 lectures each semester.

SEMESTER -V

Introduction to Archaeology

Module I will be Aims and Methods of Archaeology

Module II will be Pre-Historic, Proto-Historic and Early Historical Periods

Module III will be Epigraphy

Module IV will be Numismatics

SEMESTER -VI

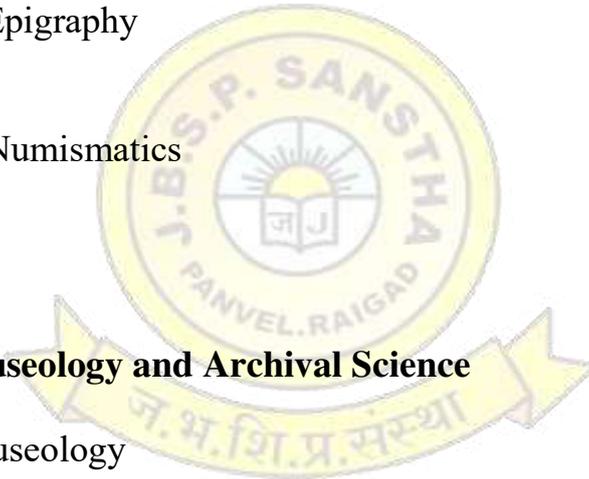
Introduction to Museology and Archival Science

Module I will be Museology

Module II will be Museums

Module III will be Archival Science

Module IV will be Management of Archives



Course Code-UAR5HS7 / UAR6HS7
Course Title- History of the Marathas (1630 CE – 1707CE)
Course Title- History of the Marathas (1707 CE – 1818 CE)

Academic Year-2021-22

Objectives:

1. To introduce the students to the regional history of Maharashtra.
2. To help students to understand the forces leading to the establishment of Maratha power under Chhatrapati Shivaji Maharaj.
3. To develop an understanding of the society and culture in Maharashtra in the 18th century.
4. To enable the students to understand the processes that led to the expansion of the Maratha Power.

Course Outcomes:

1. They will know the process of consolidation of Maratha Samrajya and successor of Shivaji Maharaj.
2. Understand how the administrative system of Royal Period is useful in present time.
3. Students will be able to analyse the Marathas polices of expansion and its consequences.
4. To follow the various personalities of the Peshwa Period.

T.Y.B.A. History

For the Subject of History there shall be two papers for 45 lectures each semester.

SEMESTER -V

History of the Marathas (1630 CE – 1707CE)

Module I will be Introduction to Maratha History

Module II will be Establishment of Swarajya

Module III will be Period of Consolidation and Crisis

Module IV will be Administration during the Royal Period

SEMESTER -VI

History of the Marathas (1707 CE – 1818 CE)

Module I will be Expansion of the Maratha Power

Module II will be Consolidation of the Maratha Power

Module III will be Post Panipat Revival and Downfall

Module IV will be Administrative and Socio-Cultural Developments

Course Code- UAR5HS8 / UAR6HS8
Course Title- History of Contemporary World (1945 CE – 2000 CE)
Course Title- History of Asia (1945 CE-2000 CE)

Academic Year-2021-22

Objective:

1. To trace some of the major events of post-World War II period.
2. To comprehend the ways in which events of the latter half of the twentieth century have influenced the present.
3. To understand the ways in which Asian nations resisted and defied the control of the West.
4. To comprehend some of the trends that emerged in Asia.

Course Outcomes:

1. Students will be gained knowledge of world events.
2. Students will be understood the major trends in 20th century.
3. They will understand the reconstruction the of Japan and major trends that emerge in Asia.
4. Learners will comprehend about the political condition of Southeast Asia.

T.Y.B.A. History

For the Subject of History there shall be two papers for 45 lectures each semester.

SEMESTER -V

History of Contemporary World (1945 CE – 2000 CE)

Module I will be Cold War (1945-1985)

Module II will be Europe, U.S.S.R and U.S.A. (1985-2000)

Module III will be Movements for Equal Rights and Challenging the Bipolar World (1945-2000)

Module IV will be Major Trends

SEMESTER -VI

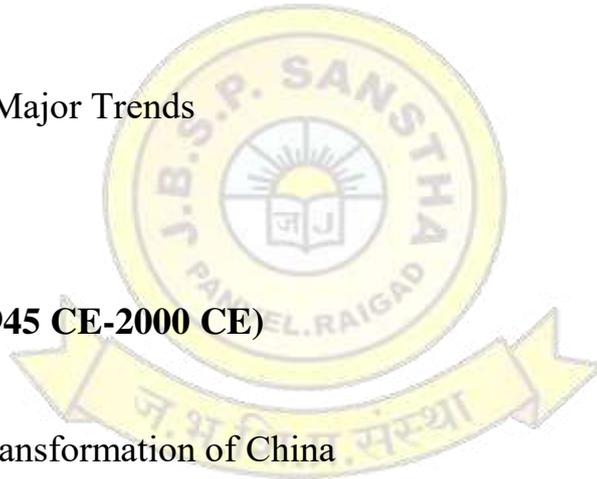
History of Asia (1945 CE-2000 CE)

Module I will be Transformation of China

Module II will be Reconstruction of Japan

Module III will be South East Asia

Module IV will be Conflicts in West Asia



Course Code- UAR5HS9 / UAR6HS
Course Title- Research Methodology and Sources of History
Course Title- Research Methodology and Sources of History

Academic Year-2021-22

Objectives:

1. To teach students basics of research methodology in history with a view to promote historical research.
2. To understand the various kinds of sources of history and its interpretation.
3. To acquaint students with the new trends and approaches in history writing.

Course Outcomes:

1. Students will be able to learn methods in research writing and understand the new trends in historical research.
2. Students can study the Sources of History through Indian Historiography.
3. The understand to students the importance of Local History in new trend of Historical Research.
4. To understand the elements of Historical Research through research.

T.Y.B.A. History

For the Subject of History there shall be two papers for 45 lectures each semester.

SEMESTER -V

Research Methodology and Sources of History

Module I will be History: Definition and Scope

Module II will be Sources of History

Module III will be Research Methods in History

Module IV will be Sources for Writing Indian History

SEMESTER -VI

Research Methodology and Sources of History

Module I will be Historical Research: Methods and Presentation

Module II will be New Trends in History

Module III will be Approaches to History

Module IV will be Indian Historiography

Revised Syllabus
Semester V and Semester VI
Programme: B.A.
Course: History and Archaeology

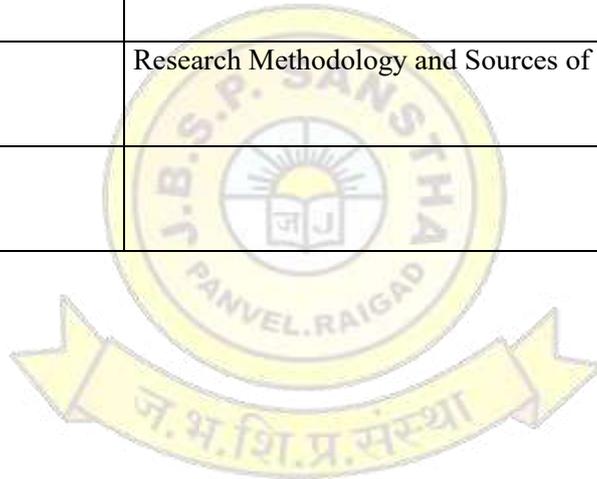
(Choice Based Credit System with effect from the Academic year 2021-2022)

SYLLABUS

SEMESTER – V		
Course	Title of the Course	Credits
Core Course IV	History of Medieval India (1000 CE – 1526 CE)	4 Credits
Core Course V	History of Modern Maharashtra (1818 CE-1960 CE)	4 Credits
Core Course VI.	Introduction to Archaeology	3 Credits
Core Course VII	History of the Marathas (1630 CE -1707 CE)	4 Credits
Core Course VIII	History of Contemporary World (1945 CE -2000 CE)	4 Credits
Core Course IX	Research Methodology and Sources of History	3 Credits
		Total 22 Credits

SEMESTER – VI

Course	Title of the Course	Credits
Core Course IV	History of Medieval India (1526 CE – 1707 CE)	4 Credits
Core Course V	History of Contemporary India (1947 CE- 2000 CE)	4 Credits
Core Course VI	Introduction to Museology and Archival Science	3 Credits
Core Course VII	History of the Marathas (1707 CE - 1818 CE)	4 Credits
Core Course VIII	History of Asia (1945 CE -2000 CE)	4 Credits
Core Course IX	Research Methodology and Sources of History	3 Credits
		Total 22 Credits



Scheme of Examination for Each

Semester:

Internal Evaluation: 25 (20 marks internal test and 05 marks for Active participation and overall conduct)

Semester End Examination: 75 Marks will be as follows -:

I	Theory:	
	Each theory paper shall be of two and half hour duration.	
	All questions are compulsory and will have internal options.	
	Q-1	(Based on Module I) 15 Marks a. or b.
	Q-2	(Based on Module II) 15Marks a. or b.
	Q-3	(Based on Module III) 15Marks a. or b.
II	Q-4	(Based on Module IV) 15Marks a. or b.
	Q-5	Attempt any two short notes.(Based on Module I, II, III and IV) 15 Marks
	The External examination	(Continuous assessment system) will be conducted as per the following scheme.
Sr. No.	Particulars of Internal Examination	Marks%
1	Test	20
2	Active participation and overall conduct	05
	TOTAL	25

T.Y.B.A. History
UAR5HS4
SEMESTER -V

Core Course IV- History of Medieval India (1000 CE-1526CE)

Objectives:

1. To acquaint the students with the history of early Medieval India that laid the foundation of the Sultanate in India.
2. To study the contribution of Vijayanagar and Bahamani kingdoms to Medieval Indian History.
3. To examine the administrative, socio-economic and cultural aspects of Medieval India.

Module I: Foundation, Expansion and Decline of Delhi Sultanate

- (a) Socio-economic and political conditions on the eve of the Turkish Invasion
- (b) Rise and Decline of Slave dynasty, Khilji Dynasty
- (c) Tughlaq, Sayyid and Lodi Dynasty

Module II: Administrative Structure of the Sultanate

- (a) Central Administration and Iqta system
- (b) Administrative and Military Reforms of Ala-ud-din Khilji
- (c) Reforms of Firozshah Tughlaq and Mohammed bin Tughlaq

Module III: Emergence of Vijaynagar and Bahamani Kingdoms

- (a) Rise, Growth and Decline of Vijaynagar and Bahamani Kingdoms
- (b) Administration, Socio-Economic and Cultural conditions of Vijayanagar Empire
- (c) Administration, Socio-Economic and Cultural conditions of Bahamani Kingdom

Module IV: Society, Economy, Religion and Culture of Delhi Sultanate

- (a) Socio-economic and religious life
- (b) Education and Literature
- (c) Art and Architecture

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T.Y.B.A. History
UAR5HS5
SEMESTER -V

Core Course V- History of Modern Maharashtra (1818 CE-1960 CE)

Objectives:

1. To acquaint students with regional history.
2. To understand political and socio-economic developments during the 19th and 20th centuries.
3. To create understanding of the movement that led to the formation of Maharashtra.

Module I: Beginning of the British Rule

- (a) Socio-Economic conditions of Maharashtra in 19th Century
- (b) Administration and Judiciary
- (c) Tribal and Peasant Uprisings

Module II: Socio- Economic Awakening

- (a) Mahatma Jotirao Phule - Satya Shodhak Samaj and Universal Humanism
- (b) Prarthana Samaj
- (c) Contribution of thinkers of Maharashtra to Economic Nationalism

Module III: Political Developments in Maharashtra (1885-1960)

- (a) Moderates, Extremists and Revolutionaries in Maharashtra
- (b) Response to Gandhian Movements in Maharashtra
- (c) Samyukta Maharashtra Movement

Module IV: Emergence of New Forces

- (a) Contribution of Reformers in Education
- (b) Contribution of Reformers towards Emancipation of Women
- (c) Contribution of Reformers towards Upliftment of Depressed Classes: V. R. Shinde, Rajarshi Shahu Maharaj and Dr. B.R. Ambedkar

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**T.Y.B.A. History
UAR5HS6
SEMESTER -V**

Core Course VI – Introduction to Archaeology

Objectives:

1. To understand the basic facets of Archaeology.
2. To evaluate the importance of Epigraphy.
3. To study the importance of Numismatics as an important source of history.

Module I: Aims and Methods of Archaeology

- (a) Definition, Aims and Development of Archaeology in India
- (b) Archaeology and History; Archaeology and Other Sciences
- (c) Field Archaeology: Methods of Exploration, Excavation and Dating Antiquities; Significance of Archaeology

Module II: Pre-Historic, Proto-Historic and Early Historical Periods

- (a) Palaeolithic and Mesolithic Periods
- (b) Neolithic and Chalcolithic Periods
- (c) Megalithic and Early Historical Periods

Module III: Epigraphy

- (a) Definition and History of Indian Epigraphy
- (b) Types of Inscriptions and their significance
- (c) Evolution of Brahmi and Kharosthi Scripts; Edicts of Ashoka

Module IV: Numismatics

- (a) Definition and History of Indian Numismatics
- (b) Ancient Indian Coinage: Punch-Marked, Satavahana, Western Kshatrapas, Kushana and Gupta Coins
- (c) Contribution of Numismatics to Indian History

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UAR5HS7
SEMESTER -V

Core Course VII- History of the Marathas (1630 CE – 1707CE)

Objectives:

1. To introduce the students to the regional history of Maharashtra.
2. To familiarize students with the literary sources of the history of the Marathas.
3. To help students to understand the forces leading to the establishment of Maratha power under Chhatrapati Shivaji Maharaj.

Module I: Introduction to Maratha History

- (a) Marathi, Persian and European Sources
- (b) Deccan in the 17th century – Geo-Political and Economic conditions
- (c) Socio-Cultural conditions; Maharashtra Dharma

Module II: Establishment of Swarajya

- (a) Chhatrapati Shivaji's relations with Bijapur
- (b) Chhatrapati Shivaji's relations with the Mughals
- (c) Chhatrapati Shivaji's relations with the Europeans

Module III: Period of Consolidation and Crisis

- (a) Coronation and its significance; Chhatrapati Shivaji's Karnatak Campaign
- (b) Chhatrapati Sambhaji, Chhatrapati Rajaram and Maharani Tarabai
- (c) Civil War : Maharani Tarabai and Chhatrapati Shahu

Module IV: Administration during the Royal Period

- (a) Civil Administration
- (b) Revenue and Judicial Administration
- (c) Military Administration

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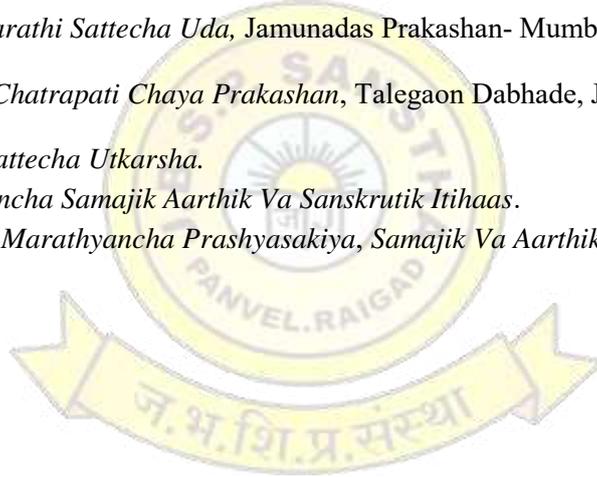
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UAR5HS8
SEMESTER -V

Core Course VIII: History of Contemporary World (1945 CE – 2000 CE)

Objectives:

1. To trace some of the major events of post-World War II period.
2. To understand the significance of these events.
3. To comprehend the ways in which events of the latter half of the twentieth century have influenced the present.

Module I: Cold War (1945-1985)

- (a) Meaning, Causes of Cold War and Security Pacts
- (b) Conflicts in Cold War: Germany, Korea and Cuba
- (c) Economic Revival of Western Europe; Soviet Union's Relations with Eastern Europe

Module II: Europe, U.S.S.R and U.S.A. (1985-2000)

- (a) Disintegration of U.S.S.R
- (b) Re-drawing of political borders of Germany, Yugoslavia and Czechoslovakia; Emergence of the European Union (EU) in Western Europe
- (c) U.S.A as the dominant world power

Module III: Movements for Equal Rights and Challenging the Bipolar World (1945-2000)

- (a) Campaigns within and outside South Africa against Apartheid
- (b) Civil Rights Movement in U.S.A
- (c) Non-Aligned Movement

Module IV: Major Trends

- (a) Globalisation
- (b) Sustainable Development
- (c) Women's Liberation Movement

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T.Y.B.A. History
UAR5HS9
SEMESTER -V

Elective Course IX - Research Methodology and Sources of History

Objectives:

1. To teach students basics of research methodology in history with a view to promote historical research.
2. To understand the various kinds of sources of history and its interpretation.
3. To acquaint students with the new trends and approaches in history writing.

Module I: History: Definition and Scope

- (a) History: Meaning, Scope and Nature
- (b) Importance of History
- (c) History and Auxiliary Sciences

Module II: Sources of History

- (a) Sources: Nature and Types
- (b) Authenticity and Credibility of Sources
- (c) Importance of Archival Sources

Module III: Research Methods in History

- (a) Meaning of Historical Research: Methods of Data Collection
- (b) Interpretation and Generalisation of Sources
- (c) Footnotes and Bibliography

Module IV: Sources for Writing Indian History

- (a) Sources for Ancient Indian History
- (b) Sources for Medieval Indian and Maratha History
- (c) Sources for Modern Indian History

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SEMESTER -VI

Core Course: IV- History of Medieval India (1526 CE-1707CE)

Objectives:

1. To acquaint the students with the history of India since the emergence of the Mughal rule.
2. To understand administration of the Mughal Empire.
3. To study the rise of the Maratha Power.

Module I: Foundation, Expansion and Decline of the Mughal Rule

- (a) India on the eve of Mughal Rule; Invasion of Babur
- (b) Humayun, Shershah and Akbar
- (c) Jahangir, Shahjahan and Aurangzeb

Module II: Administrative Structure of the Mughals

- (a) Central and Provincial Administration
- (b) Mansabdari System
- (c) Revenue and Judicial system

Module III: Rise of the Maratha Power

- (a) Chhatrapati Shivaji and Foundation of Swarajya
- (b) Administration of Chhatrapati Shivaji
- (c) Chhatrapati Sambhaji, Chattrapati Rajaram and Maharani Tarabai

Module IV: Society and Economy, Religion and Culture of the Mughal Rule

- (a) Society and Economy
- (b) Religion, Education and Literature
- (c) Art and Architecture

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SEMESTER -VI

Core Course V – History of Contemporary India (1947 CE- 2000 CE)

Objectives:

1. To understand the process of making the Constitution and the Integration and Reorganization of Indian States.
2. To acquaint the students with the political developments in India after Independence.
3. To comprehend the socio-economic changes and progress in science and technology in India.

Module I: The Nehru Era (1947 CE – 1964 CE)

- (a) Features of Indian Constitution
- (b) Integration and Reorganization of Indian States
- (c) Socio- Economic Reforms and Foreign Policy

Module II: Political, Social and Economic Developments (1964 CE – 1984 CE)

- (a) Political Developments after Nehru Era; Green Revolution.
- (b) Abolition of Privy Purses and Titles; Nationalization of Banks; The Emergency
- (c) Janata Government; Return of Congress to power ; Foreign Policy

Module III: Political, Social and Economic Developments (1984 CE – 2000 CE)

- (a) Political Developments
- (b) Relations with Neighboring Countries
- (c) Science, Technology and Education

Module IV: Emerging Trends

- (a) Communalism and Separatist Movements
- (b) Empowerment of Women Policy of Reservation
- (c) Policy of Reservation

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SEMESTER -VI

Elective Course VI - Introduction to Museology and Archival Science

Objectives:

1. To inform the students about the role of Museums in the preservation of Heritage.
2. To understand the importance of Archival Science in the study of History.
3. To encourage students to pursue careers in various Museums and Archives in India and abroad.

Module I: Museology

- (a) Definition of Museology, Museum Movement in India
- (b) Role of the Curator
- (c) Types of Museums

Module II: Museums

- (a) Methods of Collection and Conservation of Objects in Museums
- (b) Preservation Techniques and Types of Exhibitions
- (c) Changing Role of Museums: In-house and Out-reach activities of Museums

Module III: Archival Science

- (a) Meaning, Scope, Objectives and Classes of Archives
- (b) Importance of Archives: Value of Records as Sources of History
- (c) Classification of Records

Module IV: Management of Archives

- (a) Appraisal and Retention of Records
- (b) Conservation and Preservation of Records
- (c) Digital Archives

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SEMESTER -VI

Core Course VII: History of the Marathas (1707 CE – 1818 CE)

Objectives:

1. To enable the students to understand the processes that led to the expansion of the Maratha Power.
2. To appreciate the contribution of the Marathas in the national politics of the 18th century.
3. To develop an understanding of the society and culture in Maharashtra in the 18th century.

Module I: Expansion of the Maratha Power

- (a) Rise of the Peshwas: Balaji Vishwanath
- (b) Peshwa Bajirao I
- (c) Maratha Confederacy

Module II: Consolidation of the Maratha Power

- (a) Peshwa Balaji Bajirao (Nanasaheb)
- (b) Third Battle of Panipat: causes and consequences
- (c) Defeat of the Marathas and significance of the Third Battle of Panipat

Module III: Post Panipat Revival and Decline

- (a) Peshwa Madhavrao I
- (b) Barbhai Council
- (c) Decline of the Maratha Power

Module IV: Administrative and Socio-Cultural Developments

- (a) Peshwa Administration: Civil, Revenue and Military
- (b) Society under the Peshwas – Religion, Caste and Position of Women
- (c) Cultural Developments: Literature, Art and Architecture

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SEMESTER -VI

Core Course VIII - History of Asia (1945 CE-2000 CE)

Objectives:

- 1.To acquaint the students with some of the major changes that occurred in Asia after World War II.
- 2.To understand the ways in which Asian nations resisted and defied the control of the West.
- 3.To comprehend some of the trends that emerged in Asia.

Module I: Transformation of China

- (a) Domestic Policy in People's Republic of China under Mao Zedong
- (b) Economic Progress in China under Deng Xiaoping
- (c) Foreign Policy of China with USSR

Module II: Reconstruction of Japan

- (a) American Occupation of Japan
- (b) Economic Miracle in Japan
- (c) Foreign Policy of Japan with USA

Module III: South East Asia

- (a) Cold War and Vietnam
- (b) Guided Democracy in Indonesia
- (c) Association of South East Asian Nations (ASEAN)

Module IV: Conflicts in West Asia

- (a) Arab- Israel Conflict (1948-2000)
- (b) Iranian Revolution of 1979
- (c) Oil Politics and OPEC

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SEMESTER -VI

Elective Course IX - Research Methodology and Sources of History

Objectives:

1. To teach students basics of research methodology in history with a view to promote historical research.
2. To understand the various kinds of sources of history and its interpretation.
3. To acquaint students with the new trends and approaches in history writing.

Module I: Historical Research: Methods and Presentation

- (a) Steps in Historical Research
- (b) Methods of Critical Enquiry
- (c) Presentation of Historical Research

Module II: New Trends in History

- (a) Local History
- (b) Oral History
- (c) Digital and E-Sources

Module III: Approaches to History

- (a) Subaltern
- (b) Feminist
- (c) Post-Modern

Module IV: Indian Historiography

- (a) Imperialist
- (b) Nationalist
- (c) Marxist



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- **Note: Conducting Historical Field visits Every Year**





Janardan Bhagat Shikshan Prasarak Sanstha's
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ARTS, COMMERCE & SCIENCE COLLEGE, NEW PANVEL
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Program: B.Com

Syllabus of T.Y.B.Com. Commerce
Choice Based Credit & Grading System (75:25)
w.e.f. Academic Year 2021-22

Bachelor of Commerce (B.Com) Programme

Under Choice Based Credit, Grading and Semester System

T.Y.B.Com

(To be implemented from Academic Year- 2020-2021)

No. of Courses	Semester V	Credits	No. of Courses	Semester VI	Credits
1	<i>Elective Courses (EC)</i>		1	<i>Elective Courses (EC)</i>	
1A	<i>Discipline Specific Elective(DSE) Courses</i>		1A	<i>Discipline Specific Elective(DSE) Courses</i>	
1	Financial Accounting and Auditing VII - Financial Accounting	04	1	Financial Accounting and Auditing IX - Financial Accounting	04
2	Financial Accounting and Auditing VIII - Cost Accounting	04	2	Financial Accounting and Auditing X - Cost Accounting	04
1B	<i>Discipline Related Elective(DRE) Courses</i>		1B	<i>Discipline Related Elective(DRE) Courses</i>	
3	Commerce V	03	3	Commerce VI	03
4	Business Economics V	03	4	Business Economics VI	03
2	<i>Ability Enhancement Courses (AEC)</i>		2	<i>Ability Enhancement Courses (AEC)</i>	
5 & 6	**Any two courses from the following list of the courses	03+03	5 & 6	**Any two courses from the following list of the courses	03+03
Total Credits		20	Total Credits		20

**List of Ability Enhancement Courses (AEC) for Semester V (Any Two)		**List of Ability Enhancement Courses (AEC) for Semester VI (Any Two)	
1	Computer systems& Applications Paper -I	1	Computer systems& Applications Paper – II
2	Export Marketing Paper – I	2	Export Marketing Paper – II
3	Marketing Research Paper – I	3	Marketing Research Paper - II
4	Direct & Indirect Taxation Paper – I	4	Direct & Indirect Taxation Paper - II
Note: Course selected in Semester V will continue in Semester VI			

B.Com. Programme

Under Choice Based Credit, Grading and Semester System Course Structure

(To be implemented from Academic Year- 2021-2022)

Semester V

No. of Courses	Semester V	Credits
1	Elective Courses (EC)	
1A	Discipline Specific Elective(DSE) Courses	
1	Financial Accounting and Auditing VII - Financial Accounting	04
2	Financial Accounting and Auditing VIII - Cost Accounting	04
1B	Discipline Related Elective(DRE) Courses	
3	Commerce V	03
4	Business Economics V	03
2	Ability Enhancement Courses (AEC)	
5 & 6	**Any two courses from the following list of the courses	03+03
Total Credits		20

**List of Ability Enhancement Courses (AEC) for Semester V (Any Two)	
1	Computer systems & Applications Paper –I
2	Export Marketing Paper – I
3	Marketing Research Paper – I
4	Direct & Indirect Taxation Paper – I

***Syllabus of Courses of B.Com. Programme at Semester V with effect
from the Academic Year 2020-2021***

Elective Courses (EC)

1 B. Discipline Related Elective(DRE) Courses

**3. Commerce-V
Marketing**

• **Course objectives:**

- 1) To teach the students the concepts of marketing
- 2) To understand the various aspects and importance of marketing decision making
- 3) To understand the importance of marketing mix in decision making
- 4) To explain the various key marketing dimensions
- 5) To understand the skill sets required for effective marketing
- 6) To explain marketing ethics

• **Course Outcomes:**

- 1) Enable the student to comprehend the concepts of marketing
- 2) Be familiar with the basic elements of marketing mix
- 3) Evaluate the key marketing dimensions for decision making
- 4) Prepare the skill sets required for a career in marketing
- 5) Understanding the importance of ethics in marketing

Modules at a Glance

Sr. No.	Modules	No. of Lectures
1	Introduction to Marketing	12
2	Marketing Decisions I	11
3	Marketing Decisions	11
4	Key Marketing Dimensions	11
Total		45

Modules at a Glance

Sr. No.	Modules / Units
1	Introduction to Marketing
	<ul style="list-style-type: none"> • Marketing, Concept, Features, Importance, Functions, Evolution, Strategic v/s Traditional Marketing • Marketing Research - Concept, Features, Process Marketing Information System-Concept, Components Data Mining- Concept, Importance • Consumer Behaviour- Concept, ,Factors influencing Consumer Behaviour Market Segmentation- Concept, Benefits, Bases of market segmentation Customer Relationship Management-Concept, Techniques, Customer engagement- Tools Market Targeting- Concept, Five patterns of Target market Selection
2	Marketing Decisions I
	<ul style="list-style-type: none"> • Marketing Mix- Concept, Product- Product Decision Areas Product Life Cycle- Concept, Managing stages of PLC Branding- Concept , Components Brand Equity- Concept , Factors influencing Brand Equity • Packaging- Concept , Essentials of a good package Product Positioning- Concept, Strategies of Product Positioning Service Positioning- Importance & Challenges • Pricing- Concept, Objectives, Factors influencing Pricing, Pricing Strategies
3	Marketing Decisions
	<ul style="list-style-type: none"> • Physical Distribution- Concept, Factors influencing Physical Distribution, Marketing Channels (Traditional & Contemporary Channels) Supply Chain Management-Concept, Components of SCM • Promotion- Concept, Importance, Elements of Promotion mix Integrated Marketing Communication (IMC)- Concept, Scope ,Importance • Sales Management- Concept, Components, Emerging trends in selling

	Personal Selling- Concept , Process of personal selling, Skill Sets required for Effective Selling
4	Key Marketing Dimensions
	<ul style="list-style-type: none"> • Marketing Ethics: Concept, Unethical practices in marketing, Marketing Myths Competitive Strategies for Market Leader, Market Challenger, Market Follower, and Market Nicher. • Rural Marketing- Concept, Features of Indian Rural Market, Strategies for Effective Rural Marketing Digital Marketing-Concept, trends in Digital Marketing Green Marketing- concept, importance • Challenges faced by Marketing Managers in 21st Century Careers in Marketing – Skill sets required for effective marketing Factors contributing to Success of brands in India with suitable examples, Marketing During a Pandemic

Revised Syllabus of Courses of B.Com. Programme at Semester V with effect from the Academic Year 2018-2019

Elective Courses (EC)

2. Ability Enhancement Courses (AEC)

3. Export Marketing Paper - I

• **Course objectives:**

1. To give outline about the Export Marketing.
2. To aware student about global framework for export marketing.
3. To make students aware about India's foreign trade Policy.
4. To aware students regarding Export incentives and Assistance.

• **Course Outcomes:**

1. Understand importance of Export Marketing.
2. Understand various Economic Grouping of the world, and trade barriers.
3. Understand New Foreign trade Policy 2015-20 and benefits to status holder.
4. Understand financial incentives available to Indian Exporter.

Modules at a Glance

Sr. No.	Modules	No. of Lectures
1	Introduction to Export Marketing	12
2	Global Framework for Export Marketing	11
3	India's Foreign Trade Policy	11
4	Export Incentives and Assistance	11
Total		45

Sr. No.	Modules / Units
1	Introduction to Export Marketing
	<ul style="list-style-type: none"> a) Concept and features of Export Marketing; Importance of Exports for a Nation and a Firm; Distinction between Domestic Marketing and Export Marketing b) Factors influencing Export Marketing; Risks involved in Export Marketing; Problems of India's Export Sector c) Major merchandise/commodities exports of India (since 2015); Services exports of India (since 2015); Region-wise India's Export Trade (since 2015)
2	Global Framework for Export Marketing
	<ul style="list-style-type: none"> a) Trade barriers; Types of Tariff Barriers and Non-Tariff barriers; Distinction between Tariff and Non-Tariff barriers b) Major Economic Groupings of the World (EU (European Union), ASEAN (The Association of Southeast Asian Nations), SAARC (The South Asian Association of Regional Cooperation), NAFTA (The North American Free Trade Agreement) BRICS (Brazil, Russia, India, China, South Africa) APEC (Asia -Pacific Economic Cooperation)); Positive and Negative Impact of Regional Economic Groupings; Agreements of World Trade Organization (WTO) c) Need for Overseas Market Research; Market Selection Process, Determinants of Foreign Market Selection E- Exporting
3	India's Foreign Trade Policy
	<ul style="list-style-type: none"> a) Foreign Trade Policy (FTP) 2015-20 - Highlights and Implications, Export Trade facilitations and ease of doing business as per the new FTP b) Role of Directorate General of Foreign Trade (DGFT), Negative list of Exports, Deemed Exports c) Benefits to Status Holders & Towns of Excellence; Common benefits for EHTP, BTP and STP; Benefits enjoyed by (IIAs) Integrated Industrial Areas(SEZ), EOU, AEZ Production Link Incentive Scheme (PLI)
4	Export Incentives and Assistance

	<p>a. Financial Incentives available to Indian Exporters - Marketing Development Assistance (MDA), Market Access Initiative (MAI), Assistance to States for Infrastructure Development for Exports (ASIDE), Industrial Raw Material Assistance Centre(IRMAC),</p> <p>b. Institutional Assistance to Indian Exporters - Federation of Indian Export Organisations (FIEO), India Trade Promotion Organisation (ITPO), The Federation of Indian Chambers of Commerce and Industry (FICCI), Export Promotion Councils (EPCs) & Commodity Boards (CBs), Indian Institute of Foreign Trade (IIFT), Indian Institute of Packaging (IIP)</p> <p>c. Schemes - Export Promotion Capital Goods (EPCG) Scheme, Duty Exemption and Remission Schemes, Export Advance Authorisation Scheme; Duty Drawback (DBK); IGST Refund for Exporters</p>
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Revised Syllabus of Courses of B.Com. Programme at Semester V with effect from the Academic Year 2020-2021

Elective Courses (EC)

2. Ability Enhancement Courses (AEC)

4. Marketing Research Paper – I

• **Course objectives:**

- 1) To introduce the concepts of marketing research
- 2) To understand the various steps and stages in planning marketing research
- 3) To make learners familiar with the sources of data collection
- 4) To provide analytical framework of data processing and analysis
- 5) To facilitate students to integrate technology in data collection and introduction to statistical tools in data analysis
- 6) To enable students to understand the significance of good report writing

• **Course Outcomes:**

- 1) Comprehend the concepts of marketing research
- 2) Enable the student to undertake marketing research
- 3) Evaluate the various sources of data collection
- 4) Familiar with data processing, analysis and reporting
- 5) Integrating the use of technology in data collection and analysis

Modules at a Glance

Sr. No.	Modules	No. of Lectures
1	Introduction to Marketing Research	12
2	Planning Research	11
3	Data Collection	11
4	Data Processing, Analysis, Reporting	11
Total		45

Sr. No.	Modules / Units
1	Introduction to Marketing Research
	<ul style="list-style-type: none"> a. Marketing Research- Definition, features, functions, significance of Marketing Research in marketing decision making, limitations of Marketing Research b. Steps in Marketing Research, Ethics in Marketing Research, Career options in Marketing Research, Qualities of a good Marketing Research professional c. Marketing Information System- Definition, components, essentials of a good MIS, Key Performance Indicator (KPI) Dashboards- concept and examples, Concept of Decision Support System- Components , importance Data Mining- concept, importance
2	Planning Research
	<ul style="list-style-type: none"> a. Research Design- concept, importance, types Hypothesis- concept, types, importance b. Questionnaire- concept, types of questions, steps in the preparation of questionnaire, essentials of a good questionnaire c. Sampling- concept, terms in sampling, techniques of sampling, essentials of good sampling
3	Data Collection
	<ul style="list-style-type: none"> a. Primary data-concept, merits, demerits, methods b. Secondary data- concept, merits, demerits, sources c. Qualitative and Quantitative research- concept, features, Qualitative v/s Quantitative research <p>Integrating technology in data collection, methods- (online surveys, hand held devices, text messages, social networking), importance</p>
4	Data Processing, Analysis, Reporting
	<ul style="list-style-type: none"> a. Stages in Data processing Editing- meaning, objectives, types Coding- meaning, guidelines Classification- meaning, methods Tabulation- meaning, methods b. Data Analysis & Interpretation Data Analysis- meaning, steps, use of statistical tools (SPSS, SAS, MS EXCEL, MINITAB) Data Interpretation- meaning, importance, stages c. Report Writing- concept, types, contents, essentials, use of visual aids in research report

Revised Syllabus of Courses of B.Com.Programme at Semester V with effect from the Academic Year 2018-2019

Reference Books

Commerce V
<ul style="list-style-type: none">• Phillip Kotler. (2005) <i>Marketing Management, Englewood cliffs, Prentice Hall, NJ</i>• Richard M. S Wilson, Colin Gilligan, <i>Strategic Marketing Management, VivaBooks Pvt. Ltd., 2003.</i>• Walker –Boyd, Larreche , <i>Marketing Strategies –Planning Implementations, TataMacGraw Hill. 2004.</i>• Neelamegam, S. (2007) <i>Marketing in India : Cases and Readings, Vikas, New Delhi</i>• Kotler, P., Keller, K.L. Koshy, A. & Jha. M. (2009). <i>Marketing Management: A South Asian Perspective. (Thirteenth Ed). Pearson Education, New Delhi.</i>• Gandhi, J.C. <i>Marketing a Managerial Introduction TataMcGrawHill.</i>• Maheshwari, R.P., Jindal, Lokesh, (2011). <i>Marketing Management Theory and Practice.</i>• Sherlekar, S.A. <i>Marketing Management. Himalaya Publishing House.</i>• Saxena, Rajan. <i>Marketing Management</i>• Ramaswamy & Kumari Nama. <i>Marketing Management</i>
Ability Enhancement Courses (AEC)

3. Export Marketing Paper I
<ul style="list-style-type: none">• <i>Export Policy Procedures & Documentation – M. I. Mahajan, Snow White Publications Pvt. Ltd, 26th Edition,</i>• <i>International Business, K. Aswathappa, McGraw-Hill Education (India) Pvt. Ltd., 6th Edition</i>• <i>Export Import Procedures - Documentation and Logistics, C. Rama Gopal, New Age International Publishers, 2006 / Reprint Jan 2016</i>• <i>International Trade and Export Management, Francis Cherunilam, Himalaya Publishing House, 20th Edition, 2017</i>• <i>R. K. Jain's, Foreign Trade Policy & Handbook of Procedures [With Forms, Circulars & Public Notices], Centax Publication, 2017</i>• <i>EXIM Policy & Handbook of EXIM Procedure – VOL I & II</i>• <i>International Marketing and Export Management, Gerald Albaum, Edwin Duerr, Alexander Josiassen, Pearson Publications, 8th Edition, June 2016</i>• <i>International Marketing Strategy, Isobel Doole and Robin Lowe, 5th Edition, Thomson Learning, 2008.</i>• <i>Global marketing, Warren J. Keegan 9th Edition Pearson Education, Delhi,</i>• <i>New Import Export Policy - Nabhi Publications, 2017</i>• <i>P.K. Khurana, Export Management, Galgotia Publishing Co, New Delhi</i>• <i>P.K. Vasudeva, International Marketing-, Excel Books, fourth edition, New Delhi</i>• <i>Paras Ram, Export documentation and procedure A-Z</i>• <i>Export: What, Where, How? Paras Ram, & Nikhil K. Garg, Anupam Publishers, 47th Edition, 2016-17</i>• <i>International Marketing, Mary C. Gilly, John L. Graham, Philip R. Cateora, 14th Edition, Tata McGraw-Hill Co. Ltd., 2014</i>

- *International Marketing Management, An Indian Perspective*, R.L. Varshney and B. Bhattacharya, Sultan Chand & Sons, 24th Edition, 2012
- *International Marketing Analysis and Strategy*, SakOnkvisit, John J. Shaw, Prentice-Hall of India Pvt. Ltd., 5th Edition, 2008
- *International Marketing*, Subhash C. Jain, South-Western, 6th Edition, 2001
- *Export Management*, T.A.S. Balagopal, Himalaya Publishing House, Mumbai, 2014
- *Michael R. Czinkota and Iikka A. Ronkainen, International Marketing*, South-Western, 10th Edition, 2012
- *Export-Import and Logistics Management*, Charlie Hill, Random Publications, 2014
- *International Marketing Management*, M.V. Kulkarni, Everest Publishing House

4. Marketing Research Paper I

- *Marketing Research Text and Cases*, Rajendra Nargundkar, McGraw Hill, 2nd edition
- *Marketing Research (Text with Cases)*, Suja Nair, Himalaya Publishing House, Maharashtra, 2014
- *Marketing Research*, John Boyce, Tata McGraw Hill Publishing Co. Ltd., Maharashtra, 2011
- *Encyclopaedia of Marketing Research Series*, S.D. Singh, Anmol Publications Pvt. Ltd., New Delhi, 2012
- *Marketing Research: A Global Outlook*, V. Kumar, Sage Publications, New Delhi, 2015
- *Marketing Research*, G. C. Beri, McGraw Hill, New Delhi, 2007
- *Fundamentals of Marketing Research*, M.K. Gawande, Chandralok Prakashan, Kanpur, 2012
- *Marketing Research: The impact of internet*, Gates, Roger et al, John Wiley & sons, Great Britain, 2002

B.Com. Programme
Under Choice Based Credit, Grading and Semester System
Course Structure

(To be implemented from Academic Year- 2020-2021)

Semester VI

***Syllabus of Courses of B.Com. Programme at Semester VI with
effect from the Academic Year 2020-2021***

Elective Courses (EC)

1 B. Discipline Related Elective(DRE) Courses

3. Commerce-VI

Human Resource Management

• **Course objectives:**

- 1) To teach the students the concepts of **Human Resource Management**
- 2) To understand the various aspects and importance of **Human Resource Development**
- 3) To understand the importance of human relations and employee welfare
- 4) To explain the recent trends in **Human Resource Management**
- 5) To understand the challenges in human resource management
- 6) To explain the importance of human resources and their effective management in organizations

• **Course Outcomes:**

- 1) Develop the understanding of the concepts of **Human Resource Management**
- 2) Be familiar with the various aspects of **Human Resource Development**
- 3) Develop an understanding of the importance of Human relations
- 4) Evaluate and understand the various aspects of leadership, motivation, employee morale, employee grievance and their effective management in organizations

5) To integrate the knowledge of the concepts of **Human Resource Management to take correct business decisions.**

Modules at a Glance

Sr. No.	Modules	No. of Lectures
01	Human Resource Management	12
02	Human Resource Development	11
03	Human Relations	11
04	Trends In Human Resource Management	11
Total		45

Modules at a Glance

Sr. No.	Modules / Units
1	Human Resource Management

	<ul style="list-style-type: none"> • Human Resource Management – Concept, Functions, Importance, Traditional v/s Strategic Human Resource Management • Human Resource Planning- Concept Steps in Human Resource Planning Job Analysis-Concept, Components, Job design- Concept, Techniques • Recruitment- Concept, Sources of Recruitment Selection - Concept , process , Techniques of E-selection,
2	Human Resource Development
	<ul style="list-style-type: none"> • Human Resource Development- Concept, functions Training- Concept, Process of identifying training and development needs, Methods of Training & Development (Apprenticeship, understudy, job rotation, vestibule training, case study, role playing, sensitivity training, In-basket, management games, E- Training) Evaluating training effectiveness- Concept, Methods • Performance Appraisal- Concept, Benefits, Limitations, Methods Potential Appraisal-Concept, Importance • Career Planning- Concept, Importance Succession Planning- Concept, Need Mentoring- Concept, Importance Counselling- Concept, Techniques.
3	Human Relations
	<ul style="list-style-type: none"> • Human Relations- Concept, Significance Leadership –Concept, Transactional & Transformational Leadership Motivation- Concept, Theories of Motivation,(Maslow’s Need Hierarchy Theory, Vroom’s Expectancy Theory, McGregor’s Theory X and Theory Y, Pink’s Theory of Motivation) • Employees Morale- Concept, Factors affecting Morale, Measurement of Employees Morale Emotional Quotient and Spiritual Quotient- Concept, Factors affecting EQ & SQ • Employee Grievance- Causes, Procedure for Grievance redressal

	Employee welfare measures and Healthy & Safety Measures.
4	Trends In Human Resource Management
	<ul style="list-style-type: none"> • HR in changing environment: Competencies- concept, classification Learning organizations- Concept, Creating an innovative organization, Innovation culture- Concept, Need, Managerial role. • Trends in Human Resource Management, : Employee Engagement- Concept, Types Human resource Information System (HRIS) – Concept, Importance, Changing patterns of employment. • Challenges in Human Resource Management: Employee Empowerment, Workforce Diversity. Inclusion in the workplace, Attrition, Downsizing, Employee Absenteeism, Work life Balance, Sexual Harassment at work place, Domestic and International HR Practices, Millennial (Gen Y), Competency Mapping, Human Resource Management during a Pandemic.

***Revised Syllabus of Courses of B.Com. Programme at Semester VI with
effect from the Academic Year 2020-2021***

Elective Courses (EC)

2. Ability Enhancement Courses (AEC)

3. Export Marketing Paper - II

• **Course objectives:**

1. Introduction about product planning and pricing decisions for export marketing.
2. To aware student regarding export distribution and promotion.
3. To make students aware about export finance.

4. To aware students regarding Export procedure and documentation

Course Outcomes:

1. Understand factors determining export price .Need for labelling and export marketing.
2. Understand factors influencing distribution channels, components of logistics and sales [promotion techniques.
3. Understand methods of payment in export marketing. Role of commercial bank, EXIM, SIDBI in financing exporters, ECGC.
4. Understand registration with different authorities, shipping and custom stage formalities

Modules at a Glance

Sr. No.	Modules	No. of Lectures
1	Product Planning and Pricing Decisions for Export Marketing	12
2	Export Distribution and Promotion	11
3	Export Finance	11
4	Export Procedure and Documentation	11
Total		45

Sr. No.	Modules / Units
1	Product Planning and Pricing Decisions for Export Marketing
	<ul style="list-style-type: none"> a) Planning for Export Marketing with regards to Product, Branding, Packaging ROHS (Restriction of Hazardous Substances, Recycling) b) Need for Labelling and Marking in Exports, Factors determining Export Price; Objectives of Export Pricing c) International Commercial (INCO) Terms; Export Pricing Quotations – Free on Board (FOB), Cost Insurance and Freight (CIF) and Cost and Freight (C&F); Problems on FOB quotation
2	Export Distribution and Promotion
	<ul style="list-style-type: none"> a) Factors influencing Distribution Channels; Direct and Indirect Exporting Channels; Distinction between Direct and Indirect Exporting Channels b) Components of Logistics in Export marketing; Selection criteria of Modes of Transport; Need for Insurance in Export Marketing, Warehousing c) Sales Promotion Techniques used in Export Marketing; Importance of Trade Fairs and Exhibitions; Benefits of Personal Selling; Essentials of Advertising in Export Marketing; Grey Marketing
3	Export Finance
	<ul style="list-style-type: none"> a) Methods of Payment In export marketing; Procedure to open Letter of Credit, Types and Benefits of Countertrade b) Features of Pre-shipment and Post-shipment finance; Procedure to obtain Export Finance; Distinction between Pre-shipment Finance and Post Shipment Finance. c) Role of Commercial Banks, EXIM Bank, SIDBI in financing exporters; Role of ECGC
4	Export Procedure and Documentation
	<ul style="list-style-type: none"> a. Registration with different authorities; Pre-shipment Procedure involved in Exports; Procedure of Quality Control and Pre-shipment Inspection; (HSN Harmonized System of Nomenclature) b. Shipping and Custom Stage Formalities; Role of Clearing & Forwarding Agent; Post-shipment Procedure for Realization of Export Proceeds; Procedure of Export under Bond and Letter of Undertaking. (LUT) c. Importance of - Commercial Invoice cum Packing list, Bill of Lading/ Airway Bill, Shipping Bill/Bill of Export, Consular Invoice, Certificate of Origin. Performa of Bills

Revised Syllabus of Courses of B.Com. Programme at Semester VI with effect from the Academic Year 2021-2022

Elective Courses (EC)

2. Ability Enhancement Courses (AEC)

4. Marketing Research Paper – II

• **Course objectives:**

- 1) To introduce the concepts of application of marketing research
- 2) To understand the various aspects of Product, brand and price research
- 3) To make learners familiar with physical, promotion, advertising and consumer research
- 4) To explain about sales, rural marketing and global research
- 5) To facilitate students to understand about managing marketing research activities
- 6) To introduce students to a few prominent marketing research agencies

• **Course Outcomes:**

- 1) Understand the concepts of application of marketing research
- 2) Enable the student to gain knowledge about various aspects of application of marketing research
- 3) Evaluate the in house and professional marketing research agencies
- 4) Familiar with prominent marketing research agencies
- 5) Developing the skill to undertake small projects of marketing research

Modules at a Glance

Sr. No.	Modules	No. of Lectures
1	Applications of Marketing Research-I	12
2	Applications of Marketing Research-II	11
3	Applications of Marketing Research-III	11
4	Managing Marketing Research	11
Total		45

Modules at a Glance

Sr. No.	Modules / Units
1	Applications of Marketing Research-I
	<ul style="list-style-type: none"> a. Product Research- concept, areas, steps in new product development Product Testing & Test Marketing- concept, methods b. Brand Research- concept, components of a Brand, importance of brand research Packaging Research- concept, importance c. Price Research- concept, factors influencing pricing, importance of price research, methods of price research
2	Applications of Marketing Research-II
	<ul style="list-style-type: none"> a. Physical Distribution research- concept, types of distribution channels, Supply Chain Management- concept, components of supply chain management, importance of physical distribution research b. Promotion Research- concept, elements of promotion, importance of promotion research Advertising Research- concept, scope, pre & post testing methods of advertising effectiveness c. Consumer Research- concept, objectives, methods. Customer experience management- Importance. Motivation Research- concept, importance
3	Applications of Marketing Research-III
	<ul style="list-style-type: none"> a. Sales Research- concept, significance, scope/areas b. Rural Marketing Research-concept, features of Indian rural market, sources of data, research tools, do's and don'ts in rural Marketing Research c. Global Marketing Research- concept, factors affecting Global Marketing , need and scope of Global Marketing Research
4	Managing Marketing Research
	<ul style="list-style-type: none"> a. Organizing Marketing Research activity- factors involved in organizing Marketing Research activity, methods of organizing Marketing Research activity, In house marketing department,--structure, merits , demerits b. Professional Marketing Research agencies- structure, merits, demerits, professional standards c. Prominent Marketing Research agencies- HTA, ORG, IMRB, NCAER, Nielson, Marketing Research during a Pandemic.

**Revised Syllabus of Courses of B.Com.Programme at Semester VI
with effect from the Academic Year 2021-2022**

Reference Books

Commerce VI

- *Bernardin, John H: Human Resource Management, Tata McGraw Hill, New Delhi 2004.*
- *Arthur M, Career Theory Handbook, Prentice Hall Inc, Englewood Cliff.*
- *Belkaoui, A.R. and Belkaoui ,JM, Human Resource Valuation: A Guide to Strategies and Techniques, Quarum Books, Greenwood, 1995.*
- *Dale, B, Total Quality and Human Resources: An Executive Guide, Blackwell, Oxford.*
- *Greenhaus, J.H., Career Management, Dryden, New York.*
- *Mabey, C and Salama, G., Strategic Human Resource Management, Blackwell, Oxford.*
- *Aswathappa. K, Human Resource Management*
- *Subba Rao, Human Resources Management.*
- *Michael Porter, HRM and Human Relations.*
- *M.N. Rudrabasavaraj: Cases in Human Resource Management –Himalaya Publishing House –NewDelhi, 1998*
- *Decenzo, D.A. and Robbins, S. P.,Fundamentals of Human Resource Management, Wiley, India.*
- *Dessler, G. and Varkkey, B., Human Resource Management,Pearson Education, Delhi.*
- *Chhabra, T.N.,Human Resource Management,Dhanpat Rai & Co., Delhi.*
- *AswathappaK.,Human Resource Management,Tata McGraw,Hill, New Delhi.*
- *H. John Bernardin and Richard W. Beatty: Performance Appraisal: Human Behavior at work –Boston: Kent, 1984*
- *George T. Milkovich and John W. Boudream: Personnel / Human Resources Management: A Diagnostic Approach, 5thEdn. Plano, TX: BusinessPublications, 1998.*
- *Lepak, David &Gowan, Mary. Human Resource Management.Dorling Kindersley (India).*
- *Khanna, S.S. Human resource Management (Text and Cases). S. Chand, New Delhi.*
- *Sadri.J, Sadri.S, Nayak.N, A Strategic Approach to HumanResource Management, JAICO Publishing House.*
- *Davar, R. S. Personnel Management and Industrial Relations. Vikas Publication, Noida.*
- *Robbins, Stephen P. OrganisationalBehaviour. Pearsons Education, New Delhi*

Reference Books

Ability Enhancement Courses (AEC)

Export Marketing II

- *Export Policy Procedures & Documentation*– M. I. Mahajan, Snow White Publications Pvt. Ltd, 26th Edition,
- *International Business*, K. Aswathappa, McGraw-Hill Education (India) Pvt. Ltd., 6th Edition
- *Export Import Procedures - Documentation and Logistics*, C. Rama Gopal, New Age International Publishers, 2006 / Reprint Jan 2016
- *International Trade and Export Management*, Francis Cherunilam, Himalaya Publishing House, 20th Edition, 2017
- *R. K. Jain's, Foreign Trade Policy & Handbook of Procedures [With Forms, Circulars & Public Notices]*, Centax Publication, 2017
- *EXIM Policy & Handbook of EXIM Procedure – VOL I & II*
- *International Marketing and Export Management*, Gerald Albaum, Edwin Duerr, Alexander Josiassen, Pearson Publications, 8th Edition, June 2016
- *International Marketing Strategy*, Isobel Doole and Robin Lowe, 5th Edition, Thomson Learning, 2008.
- *Global marketing*, Warren J. Keegan 9th Edition Pearson Education, Delhi,
- *New Import Export Policy - Nabhi Publications*, 2017
- *P.K. Khurana, Export Management*, Galgotia Publishing Co, New Delhi
- *P.K. Vasudeva, International Marketing-*, Excel Books, fourth edition, New Delhi
- *Paras Ram, Export documentation and procedure A-Z*
- *Export: What, Where, How?* Paras Ram, & Nikhil K. Garg, Anupam Publishers, 47th Edition, 2016-17
- *International Marketing*, Mary C. Gilly, John L. Graham, Philip R. Cateora, 14th Edition, Tata McGraw-Hill Co. Ltd., 2014
- *International Marketing Management, An Indian Perspective*, R.L. Varshney and B. Bhattacharya, Sultan Chand & Sons, 24th Edition, 2012
- *International Marketing Analysis and Strategy*, Sak Onkvisit, John J. Shaw, Prentice-Hall of India Pvt. Ltd., 5th Edition, 2008

Reference Books

Marketing Research Paper II

- *Marketing Research Text and Cases*, Rajendra Nargundkar, McGraw Hill, 2nd edition
- *Marketing Research (Text with Cases)*, Suja Nair, Himalaya Publishing House, Maharashtra, 2014
- *Marketing Research*, John Boyce, Tata McGraw Hill Publishing Co. Ltd., Maharashtra, 2011
- *Encyclopaedia of Marketing Research Series*, S.D. Singh, Anmol Publications Pvt. Ltd., New Delhi, 2012
- *Marketing Research: A Global Outlook*, V. Kumar, Sage Publications, New Delhi, 2015
- *Marketing Research*, G. C. Beri, McGraw Hill, New Delhi, 2007
- *Fundamentals of Marketing Research*, M.K. Gawande, Chandralok Prakashan, Kanpur, 2012
- *Marketing Research: The impact of internet*, Gates, Roger et al, John Wiley & sons, Great Britain, 2002

**Revised Syllabus of Courses of B.Com. Programme at Semester V and VI
with effect from the Academic Year 2020-2021**

**Question Paper Pattern
(Theoretical Courses)**

Credit Based Evaluation System

I) Traditional Programmes: Bachelor of Commerce (B.Com.)

❖ **Scheme of Examination**

The performance of the learners shall be evaluated into two components. The learner's Performance shall be assessed by Internal Assessment with 25% marks in the first component by conducting the Semester End Examinations with 75% marks in the second component. The allocation of marks for the Internal Assessment and Semester End Examinations are as shown below:-

A) Internal Assessment: 25 % 25 Marks

(For Courses without Practical)

Sr. No.	Particular	Marks
01	One periodical class test / online examination to be conducted in the given semester	20 Marks
02	Active participation in routine class instructional deliveries and overall conduct as a responsible learner, mannerism and articulation and exhibit of leadership qualities in organizing related academic activities	05 Marks

Question Paper Pattern

(Periodical Class Test for the Courses at Under Graduate Programmes)

Maximum Marks: 20

Questions to be set: 02

Duration: 40 Minutes

All Questions are Compulsory

Question No	Particular	Marks
Q-1	Match the Column / Fill in the Blanks / Multiple Choice Questions/ Answer in One or Two Lines (Concept based Questions) (1 Marks / 2 Marks each)	10 Marks
Q-2	Answer in Brief (Attempt any Two of the Three) (5 Marks each)	10 Marks

B) Semester End Examination: 75 %

75 Marks

- Duration: The examination shall be of $2\frac{1}{2}$ hours duration.

Question Paper Pattern

Theory question paper pattern
1. There shall be five questions each of 15 marks. 2. All questions shall be compulsory with internal options. 3. Question may be subdivided into sub-questions a, b, c... and the allocation of marks depends on the weightage of the unit.

❖ Passing Standard

The learners to pass a course shall have to obtain a minimum of 40% marks in aggregate for each course where the course consists of Internal Assessment and Semester End Examination. The learners shall obtain minimum of 40% marks (i.e. 10 out of 25) in the Internal Assessment and 40% marks in Semester End Examination (i.e. 30 Out of 75) separately, to pass the course and

minimum of Grade D, wherever applicable, to pass a particular semester. A learner will be said to have passed the course if the learner passes the Internal Assessment and Semester End Examination together.



Janardan Bhagat Shikshan Prasarak Sanstha's
CHANGU KANA THAKUR
ARTS, COMMERCE & SCIENCE COLLEGE,
NEW PANVEL (AUTONOMOUS)

Re-accredited 'A+' Grade by NAAC
'College with Potential for Excellence' Status Awarded by UGC
'Best College Award' by University of Mumbai

Department of Accounting & Finance
Board of Studies in Accounting & Finance

Program: B.Com. Accounting & Finance
Revised Syllabus of T.Y.B.Com. Accounting & Finance
(Sem. V & VI)
Choice Based Credit & Grading System (60:40)
w.e.f. Academic Year 2021-22

Sr. No.	Heading	Particulars
1	Title of Programme	B.Com. Accounting & Finance
2	Eligibility for Admission	12 th Commerce/ Science of all Recognised Board
3	Passing marks	40%
4	Ordinances/Regulations (if any)	--
5	No. of Semesters	Six
6	Level	U.G.
7	Pattern	Semester (60:40)
8	Status	Revised
9	To be implemented from Academic year	2021-2022

B.Com. (Accounting and Finance) Programme

Under Choice Based Credit, Grading and Semester System

T.Y.B.Com. (Accounting and Finance)

(To be implemented from Academic Year 2021-2022)

No. of Courses	Semester V	Credits	No. of Courses	Semester VI	Credits
1	Elective Courses (EC)		1	Elective Courses (EC)	
1,2,3 &4	*Any four courses from the following list of the courses	12	1,2,3 &4	**Any four courses from the following list of the courses	12
2	Core Courses (CC)		2	Core Courses (CC)	
5	Financial Accounting - V	04	5	Financial Accounting - VII	04
6	Financial Accounting - VI	04	6	Project Work-II	04
Total Credits		20	Total Credits		20

✓ **Note:** Project work is considered as a special course involving application of knowledge in solving/analyzing/exploring a real life situation/ difficult problem. Project work would be of 04 credits each. A project work may be undertaken in any area of Elective Courses/ Study Area

*List of Elective Courses for Semester V (Any Four)		**List of Elective Courses for Semester VI (Any Four)	
01	Cost Accounting - III	01	Cost Accounting - IV
02	Financial Management - II	02	Financial Management - III
03	Taxation - III (Indirect Taxes - I)	03	Taxation - IV (Indirect Taxes- II)
04	International Finance	04	Security Analysis and Portfolio Management
05	Financial Analysis and Business Valuation	05	Management Control Systems
06	Management -II (Management Applications)	06	Economics Paper – III (Indian Economy)
Note: Course selected in Semester V will continue in Semester VI			

B.Com. (Accounting and Finance) Programme
Under Choice Based Credit, Grading and Semester System

T.Y.B.Com. Accounting & Finance Syllabus

To be implemented from the Academic year 2021-2022

Semester V

Sr. No.	Course Code	Course Title	Credits	L / Week
1	UAF5CA3	Cost Accounting - III	3	4
2	UAF5FM2	Financial Management-II	3	4
3	UAF5TX3	Taxation - III (Indirect Taxes - I)	3	4
4	UAF5INF	International Finance	3	4
5	UAF5FA5	Financial Accounting-V	4	4
6	UAF5FA6	Financial Accounting-VI	4	4

Choice Based Credit Grading and Semester System (CBCGS)

T.Y.B.Com. Accounting & Finance Semester –V Syllabus

To be implemented from the Academic year 2021-2022

1. Elective Courses (EC)

1. Cost Accounting – III

1	Preamble of the syllabus
	<p>B.Com. in Accounting & Finance is an under graduate course of Department of B.Com. (Accounting & Finance), Changu Kana Thakur Arts, Commerce & Science College, New Panvel (Autonomous), Affiliated to University of Mumbai (MH). The course is designed to guide students of B.Com Accounting and Finance to understand the costing system like Integrated and Non-Integrated system and to enhance the learners in understanding the concept of cost and its important towards the business organization. It helps to Learn to calculate the cost for activity with the help of ABC System. The performance of the learners shall be evaluated into two components i.e. internal and external. The learner's performance shall be assessed by Internal Assessment with 40 marks and External assessment with 60 marks.</p>

2	Objectives of the course
•	To enhance the learners in understanding the concept of cost and its important towards the business organization
•	To enable the learners to understand, develop and apply the techniques of costing in the decision making for business organization
•	To develop a basic techniques of Cost Accounting
•	To understand the Cost Accounting System like Integrated and Non-Integrated system and reconciliation.
•	To help for cost control and cost reduction in the organization.

3	Course Outcomes
•	Learn the process of computation of Total Cost, Process Cost and Inter-process Profit.
•	Understand the terms with regard to Cost Accounting Systems
•	Understand the terms with regard to Operating costing.
•	Learn to calculate the cost for activity with the help of ABC System.

4	Detailed Syllabus	
	Cost Accounting – III	
Sr. No.	Modules / Units	No. Of Lectures
1	Uniform Costing and Inter-Firm Comparison	05
	<p>Uniform costing Meaning of and need for Uniform costing Essentials for success of Uniform costing Advantages and limitations of Uniform costing Areas of Uniformity, Uniform cost manual</p> <p>Inter Firm Comparison Pre-requisites of inter firm comparison; Advantages and limitations Practical problems</p>	
2	Cost Accounting Systems	15
	<p>Integrated System Meaning; Features, Advantages and Disadvantages Journal Entries and Preparing Integrated Ledgers.</p> <p>Non-Integrated System Meaning; Features, Advantages and disadvantages Journal entries and Preparing Cost Control Accounts</p> <p>Reconciliation of Cost and Financial Accounts Analyse the reason for differences in profit under financial and cost accounting systems Prepare reconciliation statement for profit under financial and cost accounting systems</p>	
3	Operating Costing	10
	<p>Meaning of operating costing; Determination of per unit cost ; Pricing of services Collection of costing data</p> <p>Note-Practical problems based on costing of hospitals, hotels, goods and passengers transport service, Library and canteen.</p>	
4	Process Costing- Equivalent Units of Production and Intercrosses Profit	15
	<p>Valuation of Work in progress and Equivalent production (FIFO Method and Weighted Average Method)) Inter Process transfer at Profit Practical problems</p>	
5	Activity Based Costing System	15
	Activity Based Costing – Introduction, Advantages, Limitations, Identification of cost drivers, Practical Problems on Traditional V/s Activity Based Costing System.	

5	References Books
Cost Accounting – III	
•	<ul style="list-style-type: none"> • <i>Lectures on Costing by Swaminathan: S. Chand and Company (P) Ltd., New Delhi</i> • <i>Cost Accounting by C.S. Rayudu, Tata Mc. Grow Hill and Co. Ltd., Mumbai</i> • <i>Cost Accounting by JawaharLaland Seema Srivastava, Tata Mc. Grow Hill and Co. Ltd., Mumbai</i> • <i>Cost Accounting by Ravi M. Kishore, Taxmann Ltd., New Delhi</i> • <i>Principles and Practices of Cost Accounting by N.K. Prasad, Book Syndicate Pvt. Ltd., Calcutta</i> • <i>Cost Accounting Theory and Practice by B.K. Bhar, Tata Mc. Grow Hill and Co. Ltd., Mumbai</i> • <i>Cost Accounting Principles and Practice by M.N. Arora, Vikas Publishing House Pvt. Ltd., New Delhi</i> • <i>Advanced Cost and Management Accounting: Problems and Solutions by V.K. Saxena and C.D. Vashist, S. Chand and Company (P) Ltd., New Delhi</i> • <i>Cost Accounting by S.P. Jain and K.L. Narang, Kalyani Publishers, Ludhiana</i> • <i>Modern Cost and Management Accounting by M. Hanif, Tata McGraw Hill Education Pvt. Ltd., New Delhi</i>

Choice Based Credit Grading and Semester System (CBCGS)

T.Y.B.Com. Accounting & Finance Semester –V Syllabus

To be implemented from the Academic year 2021-2022

1. Elective Courses (EC)

2. Financial Management -II

1	Preamble of the syllabus
	<p>B.Com. in Accounting & Finance is an under graduation course of Department of B.Com. (Accounting & Finance), Changu Kana Thakur Arts, Commerce & Science College, New Panvel (Autonomous), Affiliated to University of Mumbai (MH). The course is designed to guide students of B.Com accounting and finance to evaluate strategic financial management options in the light of changing environments and effectively manage the financial operations of business also understand about the capital structure theories The performance of the learners shall be evaluated into two components i.e. internal and external. The learner's performance shall be assessed by Internal Assessment with 40 marks and external assessment with 60 marks.</p>

2	Objectives of the Course
•	To enhance the abilities of the learners to develop the objectives of financial management.
•	To enable the learners to understand, develop and apply the techniques of investment in the financial decision making in the business corporate
•	Determining the optimal financial strategy for various stages of the life-cycle of the enterprise
•	To understand about the capital structure theories
•	To enable the learners to understand, about mutual funds & bond valuation

3	Course Outcome
•	Learn the financial concepts used in making financial management decisions.
•	Understand the use of effective capital budgeting techniques for decision making
•	Effectively manage financial needs and business operations.
•	Grasp the financial concepts, processes, and operations from a managerial Perspective about mutual fund

Detailed Syllabus		
Financial Management-II		
Sr. No.	Modules / Units	No. Of Lectures
1	Strategic Financial Management	05
	Strategic Financial Management – Need and Importance Corporate, Business and Functional Strategy Financial Planning - Need and Importance Profit Maximization , Wealth Maximization Interface of Financial Policy and Strategic Management Relationship of Finance to Economics and Accounting Role of Financial Manager	
2	Capital Budgeting – Project Planning & Risk Analysis	15
	Introduction - Capital Budgeting Process, Project Classification and Investment Criteria. Techniques of Capital Budgeting - NPV, Benefit Cost Ratio, Internal Rate of Return, Modified Internal Rate of Return, Payback period, Discounted Payback Period and ARR. (Inclusive of Estimation of Project Cash Flows) Capital Rationing – Meaning, Need and Dealing with Capital Rationing Problems Risk Analysis in Capital Budgeting – Sources and Perspectives of Risk, Sensitivity Analysis, Scenario Analysis, Simulation Model, Decision Tree Analysis and Break Even Analysis.	
3	Capital Structure Theories and Dividend Decisions	15
	Capital Structure Theories – Background, Assumptions, Definitions and Taxation and Capital Structure Types – Net Operating Income, Net Operating Income Approach, Traditional Position, Modigliani and Miller Approach, Trade off Theory and Signaling Theory. Dividend Decisions- Need, Importance, Formulation, Legal and Procedural Aspects. Dividend Decision Models - Walter, Gordon, Graham & Dodd Model and M-M Model	
4	Mutual Fund and Bond Valuation	15
	Introduction to Mutual Fund- History & Origin, Definition, Meaning, Characteristics, Advantages, Disadvantages, Limitations of Mutual Funds, Ethics in Mutual Fund. Entities involved – Sponsor, Trust, Trustee, Asset Management Company, Registrar and Transfer Agent (RTA) and Fund Houses in India. Classification of Mutual Fund - Functional/Operational – Open ended, close ended, Interval, Portfolio – Income, Growth, Balanced, MMMF, Geographical/ Location – Domestic and Offshore, Tax Saving Funds, Exchange Traded Funds , Balance Funds , Fixed Term Plan Debt Funds and SIP. Calculations of NAV, Entry Load and Exit Load. Bond Valuation - Meaning, Measuring Bond Returns – Yield to Maturity, Yield to call and Bond Pricing. Bond Pricing Theorems, Bond Risks and Bond Duration. (Practical Problems on YTM and Bond Duration.)	
5	Credit Management	05
	Credit Management – Terms of Payment, Credit Policy Variables, Approaches of evaluation of credit policies (total approach & Incremental approach), Credit Evaluation, Credit Granting Decision, Control of Accounts Receivables ie Receivables Management, Ageing Schedule and Credit Management in India, Pledging & factoring, Innovations in receivable management Payable management – Introduction, cost & benefits of trade credit, computation of cost of payables	

5	References Books
	Financial Management - II
•	<ul style="list-style-type: none"> • <i>Fundamentals of Financial Management by D. Chandra Bose, PHI Learning Pvt. Ltd., New Delhi</i> • <i>Fundamentals of Financial Management by Bhabotosh Banerjee, PHI Learning Pvt. Ltd., New Delhi</i> • <i>Fundamentals of Financial Management by Vyuptakesh Sharma, Pearson Education, New Delhi</i> • <i>Fundamentals of Financial Management by J.C. Van Horne, Prentice Hall of India, New Delhi</i> • <i>Financial Management: Text and Problems by M.Y. Khan and P.K. Jain, Tata McGraw Hill, New Delhi</i> • <i>Financial Management: Theory and Practice by Prasanna Chandra, Tata McGraw Hill, New Delhi</i> • <i>Financial Management by I.M. Pandey, Vikas Publishing House, New Delhi</i> • <i>Financial Management by C. Paramasivan & T. Subramanian</i> • <i>Financial Management by IM Pandey</i> • <i>Financial Management by Ravi Kishor</i> • <i>Financial Management by Khan & Jain</i>

Choice Based Credit Grading and Semester System (CBCGS)

T.Y.B.Com. Accounting & Finance Semester – VSyllabus

To be implemented from the Academic year 2021-2022

1. Elective Courses (EC)

3. Taxation – III (Indirect Taxes – I)

1	Preamble of the syllabus
	<p>B.Com. in Accounting & Finance is an under graduation course of Department of B.Com. (Accounting & Finance), Changu Kana Thakur Arts, Commerce & Science College, New Panvel (Autonomus), Affiliated to University of Mumbai (MH). The course is designed to guide students of B.Com accounting and finance to enable the learners to understand the sources of revenue of the government and examine the methods of tax credit under GST and Understand the process of Registration of GST The performance of the learners shall be evaluated into two components i.e. internal and external. The learner's performance shall be assessed by Internal Assessment with 40 marks and external assessment with 60 marks.</p>

2.	Objectives of the course
•	To understand various components of GST.
•	To enable the learners to understand the sources of revenue of the government.
•	To make the learners aware of goods and services on which the government has imposed indirect tax.
•	To understand the concept of Input Tax Credit

3	Course Outcome
•	Learn to compute the assessable value of transaction related to goods and services.
•	Understand the calculation of GST for various goods and services.
•	Learn to examine the methods of tax credit under GST.
•	Understand the process of Registration of GST

4	Detailed Syllabus	
Taxation – III (Indirect Taxes – II)		
Sr. No.	Modules / Units	No. Of Lectures
1	Introduction to Indirect Taxation and GST	10
	<p>Basics for Taxation - Direct Taxes and Indirect Taxes – Features of Indirect taxes, Difference, Advantages and Disadvantages, Sources and Authority of Taxes in India (Art 246 of the Indian Constitution)</p> <p>Introduction to GST – Genesis of GST in India, Power to tax GST (Constitutional Provisions), Extent and Commencement, Meaning and Definition of GST, Benefits of GST, Conceptual Framework – CGST, IGST,SGST,UTGST, Imports of goods or services or both, Export of goods or services or both, Taxes subsumed and not subsumed under GST. GST Council and GST Network</p> <p>Definitions under CGST Act</p>	
2	Levy and Collection of GST	08
	<p>Charge of GST, Levy and Collection GST, Composite and Mixed Supplies under GST, Power to Grant Exemption, Negative list of GST, GST Rate Schedule for Goods and Services</p> <p>Composition Scheme and assessment under composition scheme (Sec.10)</p> <p>Computation of GST Tax liability</p>	
3	Concept of Supply	08
	Taxable Event Supply; Place of Supply ; Time of Supply ; Value of Supply	
4	Documentation	08
	Tax Invoices, Credit and Debit notes	
5	Input Tax Credit and Computation of GST	20
	<p>Eligibility and conditions for taking Input Tax Credit</p> <p>Apportionment of credit & Blocked credits ; Credit in special circumstances</p> <p>Computation of GST under Inter State supplies and Intra State Supplies , matching of 2a</p>	
6	Registration	06
	Registration – Persons liable for Registration, Persons not liable for Registration, Procedure for Registration, Deemed Registration,, Amendment, Cancellation and Revocation of Registration.	

Note: Relevant Law/statute/Rules in force and relevant Standards in force on 1st April immediately preceding commencement of Academic Year is applicable for ensuring examination after the relevant year.

5	References Books
	Taxation – IV (Indirect Taxes – II)
	<ul style="list-style-type: none"> • <i>Indirect Taxes: Law and Practice by V.S. Datey, Taxmann</i> • <i>Indirect Taxes by V.S. Balchandra, Sultan Chand and Sons, New Delhi</i> • <i>GST Law & practice with Customs & FTP by V.S. Datey, Taxmann</i> • <i>GST by V.S. Datey, Taxmann</i> • <i>GST & customs Law by K.M. Bansal, University Edition</i> • <i>GST Law & practice with Customs & FTP by VineetSodhani, Snow White Publications</i> • <i>GST Law & practice with Customs & FTP by Sanjiv Agarwal, Snow White Publications</i> • <i>Indirect taxes(Containing GST, Customs & FTP) by MOhd. Rafi, Bharat Publications</i>

Choice Based Credit Grading and Semester System (CBCGS)**T.Y.B.Com. Accounting & Finance Semester –VSyllabus****To be implemented from the Academic year 2021-2022****1. Elective Courses (EC)****3. International Finance**

1	Preamble of the syllabus
	<p>B.Com. in Accounting & Finance is an under graduation course of Department of B.Com. (Accounting & Finance), Changu Kana Thakur Arts, Commerce & Science College, New Panvel (Autonomous), Affiliated to University of Mumbai (MH). The course is designed to guide students of B.Com Accounting and Finance to understand different technique, problems& skills which would help them to develop the knowledge about the concept of international trade and Learn the concepts of international financial management. The performance of the learners shall be evaluated into two components i.e. internal and external. The learner’s performance shall be assessed by Internal Assessment with 40 marks and external assessment with 60 marks.</p>

2	Objectives of the course
•	To develop the knowledge about the concept of international trade & Finance
•	To enable them to understand foreign exchange market & dealings.
•	To acquire knowledge about derivatives
•	To understand the effectiveness of international financial management.

3	Course Outcome
•	Understand international trade terms and finance.
•	Deal in derivative trading.
•	Grap a basic understanding of foreign exchange market.
•	Learn the concepts of international financial management.

4	Detailed Syllabus	
	International Finance	
Sr. No.	Modules / Units	No. of Lectures
1	Derivatives – Futures	12
	Derivatives – Need and Importance, Major Players in Derivative Markets, Features of Forward Contracts, Features of Future Contract, Forward V/s Future, Theoretical Future Price, Pricing Index Futures, Initial Margin and Maintenance Margin, Marking to Market and Variation Margin.	
2	Derivatives – Options	12
	Options- Long Call, Short Call, and Long Put, Short Put, Options V/s Futures, Writer of an Option, At the Money, In the Money and Out of The Money Options. Intrinsic and Time Value, Option Spreads and Strategies, Put Call Parity Theorem.	
3	Foreign Exchange Markets and Dealings	12
	Introduction – Participants of Foreign Exchange Markets, Characteristics of Foreign Exchange Market, Major Foreign Currencies that Trade Worldwide, Foreign Currency Accounts – Nostro, Vostro and Loro (Cash Position and Currency position) Terms in Forex Market – Direct Quote and Indirect Quote, Bid, Ask and Spread, American terms, European terms, Spot, Tom, Cash and Forward Rates, Appreciation and Depreciation of currency, Premium and Discount, Swap Points, and Cross Rates.	
4	Foreign Exchange Exposure and Risk Management	12
	Exchange Rate Determination Theories – The theory of Purchasing Power Parity, The Fischer effect, The International Fischer Effect and The Theory of Interest Rate Parity. Calculation of Forward Rate and Future Spot Rate. Arbitrage in Foreign Exchange Market – Covered and Uncovered Interest Arbitrage. Foreign Exchange Risk - Introduction, Types of Exposures and Strategies for Exposure Management. Hedging Transaction Exposure, Hedging Techniques, Money Market Hedge, Forward Hedge and Hedging of Futures & Options	
5	International Financial Management	12
	International Financial Management -International source of funds, International Capital Budgeting & International working capital management	

5	Reference Books
	International Finance
	<ul style="list-style-type: none">• <i>International Financial Management, P G Apte, 5th Edition, The McGraw Hill</i>• <i>International Finance Management, Cheol . S. Eun& Bruce G. Resnick</i>• <i>International Finance – Maurice D. Levi, Special Indian Edition</i>• <i>International Finance – A Business Perspective Prakash G. Apte,</i>• <i>International Finance, V A. Aadhani</i>

Choice Based Credit Grading and Semester System (CBCGS)

T.Y.B.Com. Accounting & Finance Semester –VSyllabus

To be implemented from the Academic year 2021-2022

1. Elective Courses (EC)

4. Financial Analysis and Business Valuation

1	Preamble of the syllabus
	<p>B.Com. in Accounting & Finance is an under graduation course of Department of B.Com. (Accounting & Finance), Changu Kana Thakur Arts, Commerce & Science College, New Panvel (Autonomous), Affiliated to University of Mumbai (MH). The course is designed to guide students of B.Com Accounting and Finance to understand about financial modeling & appraisal and to acquire skill for analysing the financial statements. Learners would Analyse & compare difference valuation models The performance of the learners shall be evaluated into two components i.e. internal and external. The learner's performance shall be assessed by Internal Assessment with 40 marks and external assessment with 60 marks.</p>

2	Objectives of the course
•	To understand about financial modeling & appraisal
•	To acquire skill for analysing the financial statements
•	To know basics of valuation in business acquisition
•	To understand about valuation models

3	Course outcomes
•	Learner prepare difference financial models
•	Understand skill of analyzing the financial statements
•	Acquire knowledge of valuation of business acquisition
•	Analyse & compare difference valuation models

Detailed Syllabus		
Financial Analysis and Business Valuation		
Sr. No.	Modules / Units	No. of Lectures
1	Financial Modeling for Project Appraisal	05
	Financial Modeling – concepts and application Financial statements module area Use of functions -NPV and IRR Forecasting Techniques	
2	Financial Analysis	15
	Financial Analysis, Financial Statement Analysis, Analysis of Balance Sheet Analysis of Income Statement Analysis of Statement of Shareholder Equity Analysis of Cash flow Statement Analysis of Profitability	
3	Growth Analysis and Sustainable Earning	10
	Concept of Growth Analysis Analysis of changes in profitability and sustainable earnings Evaluation of P/B ratios and P/E ratios	
4	Basics of Valuation	06
	Introduction to valuation Value, Distinction between Price and Value Foundation of Business Valuation Purpose of business valuation Valuation Bias Uncertainties in Business Valuation Role of valuation in business acquisition, legal and tax purposes, efficient market hypothesis	
5	Valuation Models	12
	Introduction to valuation models: asset based approach, Income based approach, market based approach Discounted cash flow valuation Relative valuation Free Cash Flow valuation	
6	Valuation of Assets and Liabilities	12
	Valuation of Fixed Assets, Valuation of Inventories and Valuation of Investment Valuation of Shares Valuation of Goodwill, Patents, Copyrights, Brands, Real Estate Valuation of Liabilities	

5	Reference Books
	Financial Analysis and Business Valuation
	<ul style="list-style-type: none">• <i>Valuation: Measuring and Managing the value of Companies: Thomas Copeland- Wiley</i>• <i>The Handbook of Advance Business Valuation: Reilly and Swhweish: Mc Graw hill</i>• <i>Business Valuation: PitabasMohanty- Taxmann</i>• <i>Valuation- Measuring and Managing the value of Companies : Tim Koller- Mc Kinsey & Co</i>

Choice Based Credit Grading and Semester System (CBCGS)

T.Y.B.Com. Accounting & Finance Semester –VSyllabus

To be implemented from the Academic year 2021-2022

1. Elective Courses (EC)

5. Management- II (Management Applications)

1	Preamble of the syllabus
	<p>B.Com. in Accounting & Finance is an under graduation course of Department of B.Com. (Accounting & Finance), Changu Kana Thakur Arts, Commerce & Science College, New Panvel (Autonomous), Affiliated to University of Mumbai (MH). The course is designed to guide students of B.Com Accounting and Finance to understand about the marketing management & its aspects and to acquire the knowledge about financial management & various theories. Learners help to apply various theories for decision making on financial aspects. The performance of the learners shall be evaluated into two components i.e. internal and external. The learner's performance shall be assessed by Internal Assessment with 40 marks and external assessment with 60 marks.</p>

2	Objectives of the syllabus
•	To understand about the marketing management & its aspects
•	To acquire the knowledge about financial management & various theories
•	To know about production management
•	To understand concept of human resource management & polices of appraisal

3	Course Outcome
•	Learners enhance knowledge about marketing management
•	It helps to apply various theories for decision making on financial aspects
•	it helps to understand different aspects of production management
•	Learners would have used various policies for performance appraisal of employees.

Detailed Syllabus		
Management- II (Management Applications)		
Sr. No.	Modules / Units	No. of Lectures
1	Marketing Management	15
	<p>Meaning and Definition of Marketing – 4 Ps of Marketing, Importance</p> <p>Product Management – Meaning & Definition – Product Development Strategies, Product life cycle, Branding- Meaning, Factors influencing branding</p> <p>Price Management – Meaning and Definition – Factors affecting pricing decisions, Pricing Strategies</p> <p>Place (Distribution) Management – Meaning and Definition – Factors Governing Distribution Decisions – Types of Distribution Channels</p> <p>Promotion Management – Meaning – Promotion Strategies, Integrated marketing communication</p> <p>Case studies based on the above topics</p>	
2	Production Management	15
	<p>Meaning and Definition of Production Management – Scope of Production Management, Steps in Production Planning and Control</p> <p>Meaning of Productivity - Measurement of Productivity – Measure to increase Productivity – Productivity Movement in India</p> <p>Meaning and Definition of Quality Management – TQM – Quality Circles – ISO 9000/14000</p> <p>Inventory Management – Meaning and Methods</p> <p>Case studies based on the above topics.</p>	
3	Human Resource Management	15
	<p>Human Resource Management – Meaning, Nature, Functions of Human Resource Management; Human Resource Planning- Meaning, Process of Human Resource Planning</p> <p>Human Resource Development- Methods of Developing Human Resource</p> <p>Performance Appraisal – Meaning and Definition – Traditional and Modern Methods of Appraisal; Employee retention ; Leadership- Traits, Styles</p> <p>Motivation- Factors of Motivation, Theories of Motivation- Maslow’s Theory, Douglas MacGregor’s Theory X and Theory Y</p> <p>Case studies based on the above topics</p>	
4	Financial Management	15
	<p>Meaning and Definition of Financial Management – Functions of Financial Management</p> <p>Capital Budgeting- Introduction, Importance and Process</p> <p>Capital Structure- Meaning, Factors affecting Capital Structure</p> <p>Capital Market – Meaning and Constituents – Functions</p> <p>Fundamental Analysis – Technical Analysis - Venture Capital – DEMAT Account -</p>	

	<p>Futures and Options</p> <p>Case studies based on the above topics</p>	
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5	Reference Books
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	Management- II (Management Applications)
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<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • <i>Kotlar, Philip, Marketing Management, Prentice Hall, New Delhi.</i> • <i>Stanton, Etzel, Walker, Fundamentals of Marketing, Tata-McGraw Hill, New Delhi.</i> • <i>Saxena, Rajan, Marketing Management, Tata-McGraw Hill, New Delhi.</i> • <i>McCarthy, E.J., Basic Marketing: A managerial approach, Irwin, New York.</i> • <i>Pillai R S, Bagavathi, Modern Marketing</i> • <i>Principles of Management , Ramasamy , Himalya Publication , Mumbai</i> • <i>Principles of Management , Tripathi Reddy , Tata Mc Grew Hill</i> • <i>Management Text & Cases , VSP Rao , Excel Books, Delhi</i> • <i>Management Concepts and OB , P S Rao & N V Shah , AjabPustakalaya</i> • <i>Essentials of Management , Koontz II & W , Mc. Grew Hill , New York</i> • <i>Principles of Management-Text and Cases –Dr..M.SakthivelMurugan, New Age Publications</i>
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Choice Based Credit Grading and Semester System (CBCGS)

T.Y.B.Com. Accounting & Finance Semester –VSyllabus

To be implemented from the Academic year 2021-2022

2. Core Courses (CC)

1. Financial Accounting - V

1	Preamble of the syllabus
	<p>B.Com. in Accounting & Finance is an under graduation course of Department of B.Com. (Accounting & Finance), Changu Kana Thakur Arts, Commerce & Science College, New Panvel (Autonomous), Affiliated to University of Mumbai (MH). The course is designed to guide students of B.Com accounting and finance to understand the concept of amalgamation to study the process of liquidation of companies and preparation of liquidator's final statement of accounts which will enable them to understand the types of liquidation and its accounting treatments and get the knowledge about accounting entries based on GST. The performance of the learners shall be evaluated into two components i.e. internal and external. The learner's performance shall be assessed by Internal Assessment with 40 marks and external assessment with 60 marks.</p>
2	Objectives of the Syllabus
•	To understand the concept of amalgamation, absorption w.r.t. to AS 14
•	To study the process of liquidation of companies and preparation of liquidator's final statement account.
•	To learn and apply the provision of Companies Act 2013 for different transactions and events of internal reconstruction
•	To understand the consolidation of financial statement.
•	To understand the basics of Blockchain Accounting
3	Course Outcomes
•	Learn AS 14 and the methods of accounting for Amalgamations, concept of transferee Company and the transferor company, purchase consideration and accounting treatment.
•	Understand the procedure of internal reconstruction, its methods and accounting treatment

•	Understand the procedure of liquidation of companies, & preparation of Liquidator Final Statement
•	Enhance the knowledge about accounting entries of indirect taxation.

Detailed Syllabus		
Financial Accounting - V		
Sr. No.	Modules / Units	No. of Lectures
1	Consolidated Financial Statements	15
	Meaning, Stand Alone Financial Statements; concepts of group, holding company & subsidiary company, Consolidated Financial statements – Applicability, Advantages & Disadvantages Procedure of consolidation of Balance-sheet & Profit & Loss Account ; Apply consolidation procedure for consolidation of financial statements of subsidiaries with holding company	
2	AS – 14 - Amalgamation, Absorption & External Reconstruction (excluding inter – company holding)	15
	In the nature of merger and purchase with corresponding accounting treatments of pooling of interests and purchase method respectively. Meaning and Computation of purchase consideration (both methods of Amalgamation as per AS 14). Problems based on both methods . Inter -compnay holding ; Practical problems	
3	Internal Reconstruction	10
	Need for reconstruction and company law provisions. Distinction between internal and external reconstruction. Methods including alteration of share capital, variation of shareholder rights, sub division, consolidation, surrender and reissue / cancellation, reduction of share capital with relevant legal provisions and accounting treatment for same. ; Practical problems	
4	Liquidation of Companies	10
	Meaning of liquidation or winding up Preferential payments ;Overriding preferential payments Preparation of statement of affairs, deficit / surplus account Liquidator’s final statement of account ,B List Contributory; Practical problems	
5	Accounting for Indirect taxation	05
	Accounting entries based on Goods & service tax ; Input CGST and Input SGST / Input IGST; Output CGST and Output SGST/ Output IGST	
6	Block chain Accounting	05
	Introduction History of Blockchain & Bitcoin Blockchain Accounting : Transforming accounting and auditing Features of Blockchain Technology Types of Blockchain Accounting Benefits of	

	Block chain for accounting Impact of Blockchain on Accounting Benefits of Block chain for Auditing Impact of Blockchain on Auditing	
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5	Reference Books
Financial Accounting – V	
•	<ul style="list-style-type: none"> • <i>Introduction to Accountancy by T.S. Grewal, S. Chand and Company (P) Ltd., New Delhi</i> • <i>Advance Accounts by Shukla and Grewal, S. Chand and Company (P) Ltd., New Delhi</i> • <i>Advanced Accountancy by R.L Gupta and M. Radhaswamy, S. Chand and Company (P) Ltd., New Delhi</i> • <i>Modern Accountancy by Mukherjee and Hanif, Tata Mc. Grow Hill and Co. Ltd., Mumbai</i> • <i>Financial Accounting by LesileChandwichk, Pentice Hall of India Adin Bakley (P) Ltd., New Delhi</i> • <i>Financial Accounting for Management by Dr. Dinesh Harsalekar, Multi-Tech. Publishing Co. Ltd., Mumbai</i> • <i>Financial Accounting by P.C. Tulsian, Pearson Publications, New Delhi</i> • <i>Accounting Principles by R.N. Anthony and J.S. Reece, Richard Irwin, Inc</i> • <i>Financial Accounting by Monga, J.R. Ahuja, Girish Ahuja and Ashok Shehgal, Mayur Paper Back, Noida</i> • <i>Compendium of Statement and Standard of Accounting, ICAI</i> • <i>Indian Accounting Standards, Ashish Bhattacharya, Tata Mc. Grow Hill and Co. Ltd., Mumbai</i> • <i>Financial Accounting by Williams, Tata Mc. Grow Hill and Co. Ltd., Mumbai</i> • <i>Company Accounting Standards by ShrinivasanAnand, Taxman, New Delhi</i> • <i>Financial Accounting by V. Rajasekaran, Pearson Publications, New Delhi</i> • <i>Introduction to Financial Accounting by Horngren, Pearson Publications, New Delhi</i> • <i>Financial Accounting by M. Mukherjee and M. Hanif, Tata McGraw Hill Education Pvt. Ltd., New Delhi</i> • <i>Financial Accounting a Managerial Perspective, Varadraj B. Bapat, MehulRaithatha, Tata McGraw Hill Education Pvt. Ltd., New Delhi</i>

Choice Based Credit Grading and Semester System (CBCGS)**T.Y.B.Com. Accounting & Finance Semester – V Syllabus****To be implemented from the Academic year 2021-2022****2. Core Courses (CC)****3. Financial Accounting – VI**

1	Preamble of the Syllabus
	<p>B.Com. in Accounting & Finance is an under graduation course of Department of B.Com. (Accounting & Finance), Changu Kana Thakur Arts, Commerce & Science College, New Panvel (Autonomous), Affiliated to University of Mumbai (MH). The course is designed to guide students of B.Com accounting and finance to enhance the abilities of the learners to develop the objectives of Financial Accounting and to analyze and enhance the ability of learners for better understanding, interpretation and analysis of Financial Statement of banking company, insurance company & Limited Liability of partnership firm. The performance of the learners shall be evaluated into two components i.e. internal and external. The learner's performance shall be assessed by Internal Assessment with 40 marks and external assessment with 60 marks.</p>

2	Objectives of the Syllabus
•	To enhance the abilities of the learners to develop the objectives of Financial Accounting of Banking company
•	To enhance the abilities of the learners to develop the objectives of Financial Accounting of Insurance Company
•	To analyze and enhance the ability of learners for better understanding, interpretation and analysis of Financial Statement of Non – Banking Financial Companies
•	To understand procedure and structure of Final Accounts of Limited Liability Partnership As per LLP Act, 2008.

3	Course Outcomes
•	Understand Business Finance terms and concepts while communicating
•	Learn the importance of Life insurance and its accounting treatment.
•	Understand Financial terms and interpretation for taking financial decisions.
•	Demonstrate a basic understanding of Financial Accounting.

4	Detailed Syllabus	
Financial Accounting – VI		
Sr. No.	Modules / Units	No. of Lectures
1	Final Accounts of Banking Company	15
	<p>Legal provision in Banking Regulation Act, 1949 relating to Accounts. Statutory reserves including Cash Reserve and Statutory Liquidity Ratio. Bill purchase and discounted, rebate of bill discounted. Final Accounts in prescribed form Non – performing assets and Income from non – performing assets. Capital Adequacy Norms Classification of Advances, standard, sub – standard, doubtful and provisioning requirement.</p>	
2	Final Accounts of Insurance Company	15
	<p>General Insurance – Various types of insurance, like fire, marine, Miscellaneous, Special terms like premium, claims, commission, Management expenses, Reserve for unexpired risk, reinsurance Final Accounts in a prescribed form. Revenue Statement – Form B – RA, Profit / Loss Account – Form B – PL and Balance Sheet Form B – BS. Life Insurance Introduction of life insurance, Types of life insurance, Qualification for life insurance and Additional uses of life insurance, Revenue Account (Policyholders’ Account – Technical Account), Profit and Loss Account (Shareholders’ Account – Non-Technical Account),) Balance Sheet, Accounting Principles to be followed.</p>	
3	Non – Banking Financial Companies	08
	<p>Introduction, Definition, Registration and Regulation, Classification, Income Recognition, Accounting of Investment, Applicability of Prudential Norms, Assets classification, Non- performing Assets, Capital Adequacy, Preparation of Financial statement</p>	
4	Valuation of Goodwill and Shares	12
	<p>Valuation of Goodwill Maintainable Profit method, Super Profit Method Capitalization method, Annuity Method Valuation of Shares Intrinsic Value Method, Yield method and Fair Value Method</p>	
5	Accounting for Limited Liability Partnership	10
	<p>Statutory provisions Conversion of partnership business into Limited Liability Partnership Final accounts</p>	

Financial Accounting – VI

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- *Introduction to Accountancy by T.S. Grewal, S. Chand and Company (P) Ltd., New Delhi*
- *Advance Accounts by Shukla and Grewal, S. Chand and Company (P) Ltd., New Delhi*
- *Advanced Accountancy by R.L Gupta and M. Radhaswamy, S. Chand and Company (P) Ltd., New Delhi*
- *Modern Accountancy by Mukherjee and Hanif, Tata Mc. Grow Hill and Co. Ltd., Mumbai*
- *Financial Accounting by LesileChandwichk, Pentice Hall of India Adin Bakley (P) Ltd., New Delhi*
- *Financial Accounting for Management by Dr. Dinesh Harsalekar, Multi-Tech. Publishing Co. Ltd., Mumbai*
- *Financial Accounting by P.C. Tulsian, Pearson Publications, New Delhi*
- *Accounting Principles by R.N. Anthony and J.S. Reece, Richard Irwin, Inc*
- *Financial Accounting by Monga, J.R. Ahuja, Girish Ahuja and Ashok Shehgal, Mayur Paper Back, Noida*
- *Compendium of Statement and Standard of Accounting, ICAI*
- *Indian Accounting Standards, Ashish Bhattacharya, Tata Mc. Grow Hill and Co. Ltd., Mumbai*
- *Financial Accounting by Williams, Tata Mc. Grow Hill and Co. Ltd., Mumbai*
- *Company Accounting Standards by ShrinivasanAnand, Taxman, New Delhi*
- *Financial Accounting by V. Rajasekaran, Pearson Publications, New Delhi*
- *Introduction to Financial Accounting by Horngren, Pearson Publications, New Delhi*
- *Financial Accounting by M. Mukherjee and M. Hanif, Tata McGraw Hill Education Pvt. Ltd., New Delhi*
- *Financial Accounting a Managerial Perspective, Varadraj B. Bapat, MehulRaithatha, Tata McGraw Hill Education Pvt. Ltd., New Delhi*

Choice Based Credit Grading and Semester System (CBCGS)

T.Y.B.Com. Accounting & Finance Syllabus

To be implemented from the Academic year 2021-2022

Semester VI

Sr. No.	Course Code	Course Title	Credits	L / Week
1	UAF6CA4	Cost Accounting - IV	3	4
2	UAF6FM3	Financial Management - III	3	4
3	UAF6TX4	Taxation - IV (Indirect Taxes- II)	3	4
4	UAF6SPM	Security Analysis and Portfolio Management	3	4
5	UAF6FA7	Financial Accounting – VII	4	4
6	UAF6PRW	Project Work	4	4

Choice Based Credit Grading and Semester System (CBCGS)**T.Y.B.Com. Accounting & Finance Semester –V Syllabus****To be implemented from the Academic year 2021-2022****1. Elective Courses (EC)****1. Cost Accounting – IV**

1	Preamble of the Syllabus
	<p>B.Com. in Accounting & Finance is an under graduation course of Department of B.Com. (Accounting & Finance), Changu Kana Thakur Arts, Commerce & Science College, New Panvel (Autonomous), Affiliated to University of Mumbai (MH). The course is designed to guide students of B.Com accounting and finance to understand the decision making system followed by management system and learn the budgetary control system and It helps to take decision making. The performance of the learners shall be evaluated into two components i.e. internal and external. The learner's performance shall be assessed by Internal Assessment with 40 marks and external assessment with 60 marks.</p>

2	Objectives of the Syllabus
<ul style="list-style-type: none"> • 	To enhance the abilities of learners to develop the concept of budget and budgetary control system.
<ul style="list-style-type: none"> • 	To help for understanding marginal costing system, calculation of PVR, understand the breakeven point.
<ul style="list-style-type: none"> • 	To enhance the ability of the student to understand the decision making System followed by management system.
<ul style="list-style-type: none"> • 	To help to study standard costing and variance analysis.

3	Course Outcomes
<ul style="list-style-type: none"> • 	Understand the calculation of transfer pricing.
<ul style="list-style-type: none"> • 	Learn to calculate marginal costing system, and use it for managerial decision making.
<ul style="list-style-type: none"> • 	Understand how to establish the budget and budgetary control.

4	Detailed Syllabus	
	Cost Accounting – IV	
Sr. No.	Modules / Units	No. of Lectures
1	Budgeting and Budgetary Control	15
	Meaning & objectives, Advantages and limitations of budgets Functional budgets, fixed and flexible budgets Zero based budgeting, performance budgeting Practical problems of preparing flexible budgets and functional budgets	
2	Marginal Costing	15
	Absorption Costing and Marginal Costing Meaning of absorption costing, Introduction to marginal costing Distinction between absorption costing and marginal costing Advantages and limitations of marginal costing Cost Volume and Profit Analysis Break even analysis meaning and graphic presentation Margin of safety Indifference Curve Shut down point Key factor <i>Practical problems based on using the marginal costing formulae and key factor</i>	
3	Managerial Decision Making	15
	Make or buy ; Sales mix decisions ; Exploring new markets Plant shut down decision <i>Practical problems</i>	
4	Standard Costing and Variance Analysis	15
	Preliminaries in installing of a standard cost system Material Cost variance ; Labour cost variance Variable overhead variances; Fixed Overhead variances Sales variances ; Profit variances <i>Practical problems</i>	
5	Transfer Pricing	
	Introduction - Aims and Features, General rules, Cost-based prices, Market-based prices, Marginal cost, Dual pricing, Profit-maximizing transfer prices, Bargaining Transfer, Negotiated transfer prices and other behavioral considerations	

5	Reference Books
	Cost Accounting – IV
•	<ul style="list-style-type: none"> • <i>Lectures on Costing by Swaminathan: S. Chand and Company (P) Ltd., New Delhi</i> • <i>Cost Accounting by C.S. Rayudu, Tata Mc. Grow Hill and Co. Ltd., Mumbai</i> • <i>Cost Accounting by JawaharLaland Seema Srivastava, Tata Mc. Grow Hill and Co. Ltd., Mumbai</i> • <i>Cost Accounting by Ravi M. Kishore, Taxmann Ltd., New Delhi</i> • <i>Principles and Practices of Cost Accounting by N.K. Prasad, Book Syndicate Pvt. Ltd., Calcutta</i> • <i>Cost Accounting Theory and Practice by B.K. Bhar, Tata Mc. Grow Hill and Co. Ltd., Mumbai</i> • <i>Cost Accounting Principles and Practice by M.N. Arora, Vikas Publishing House Pvt. Ltd., New Delhi</i> • <i>Advanced Cost and Management Accounting: Problems and Solutions by V.K. Saxena and C.D. Vashist, S. Chand and Company (P) Ltd., New Delhi</i> • <i>Cost Accounting by S.P. Jain and K.L. Narang, Kalyani Publishers, Ludhiana</i> • <i>Modern Cost and Management Accounting by M. Hanif, Tata McGraw Hill Education Pvt. Ltd., New Delhi</i>

Choice Based Credit Grading and Semester System (CBCGS)**T.Y.B.Com. Accounting & Finance Semester – VI Syllabus****To be implemented from the Academic year 2021-2022****1. Elective Courses (EC)****2. Financial Management - III**

1	Preamble of the Syllabus
	<p>B.Com. in Accounting & Finance is an under graduation course of Department of B.Com. (Accounting & Finance), Changu Kana Thakur Arts, Commerce & Science College, New Panvel (Autonomous), Affiliated to University of Mumbai (MH). The course is designed to guide students of B.Com accounting and finance to develop the knowledge of business and financial management decisions which will give the learners a basic understanding of financial management & to learn about merger & acquisition also learn basic understanding of risk management The performance of the learners shall be evaluated into two components i.e. internal and external. The learner's performance shall be assessed by Internal Assessment with 40 marks and external assessment with 60 marks</p>

2	Objectives of the Syllabus
<ul style="list-style-type: none"> • 	To develop the knowledge of business finance and financial management decisions.
<ul style="list-style-type: none"> • 	To learn about merger & acquisition
<ul style="list-style-type: none"> • 	To enable an awareness of the corporate restructuring & takeover
<ul style="list-style-type: none"> • 	To teach a sense of responsibility and a capacity for financial management.

3	Course Outcomes
<ul style="list-style-type: none"> • 	Learn the financial concepts used in making financial management decisions.
<ul style="list-style-type: none"> • 	Learn about working capital financing.
<ul style="list-style-type: none"> • 	Learn basic understanding of risk management
<ul style="list-style-type: none"> • 	Understand the continuous process, managerial decision making to maintain a balance between risk & profitability, coordination process, etc.

Detailed Syllabus		
Financial Management – III		
Sr. No.	Modules / Units	No. of Lectures
1	Business Valuation	05
	Conceptual Framework of Valuation – Book Value, Market Value, Economic Value, Liquidation Value, Replacement Value, Salvage Value, Value of Goodwill and Fair Value Approaches of Valuation – Assets Based Approach to Valuation, Earnings Based Approach to Valuation, Earnings Measure on Cash Flow Basis, Market Value; Added Approach and Economic Value Added.	
2	Mergers and Acquisitions	15
	Introduction- Basic modes of acquiring another firm, Synergy effects, Difference between Merger and Takeover, Advantages of Mergers and Acquisitions, Benefits of Merger for Acquiring firm, Reasons of companies to offer themselves for sale, Reasons for failure of Mergers and Reverse Merger. Commonly Used Bases for determining the Exchange Ratio – EPS, MPS, Book value and Combination of Measures and Evaluation of Mergers (Practical Problems)	
3	Corporate Restructuring and Takeovers	15
	Introduction – Meaning, Need and Importance, Forms of Restructuring, Advantages and Disadvantages Takeovers – Meaning, SEBI Guidelines, Anti-takeover defences and Asset and Liability Restructuring. (Practical Problems)	
4	Lease and Hire Purchase Financing	12
	Introduction – Meaning and Types of Leases, Rationale, Mechanics, Operating Leases, Leasing as Financing Decisions, Calculation of Cash flows of a finance lease. Hire Purchase – Meaning, Need and Importance, Calculation of Hire Purchase instalments. Choice between Leasing and Hire Purchase	
5	Working Capital financing	08
	Introduction – Key features and Characteristics of Trade Credit, Bank Credit, Commercial Papers, Certificate of Deposits and Factoring. Practical Problems based on Factoring and calculations of yield of CP's and CD's	
6	Risk Management	05
	Types of Risk, Evaluation of Risk, Value at Risk	

5	Reference Books
Financial Management – III	
•	<ul style="list-style-type: none"> • <i>Fundamentals of Financial Management by D. Chandra Bose, PHI Learning Pvt. Ltd., New Delhi</i> • <i>Fundamentals of Financial Management by Bhabotosh Banerjee, PHI Learning Pvt. Ltd., New Delhi</i> • <i>Fundamentals of Financial Management by Vyuptakesh Sharma, Pearson Education, New Delhi</i> • <i>Fundamentals of Financial Management by J.C. Van Horne, Prentice Hall of India, New Delhi</i> • <i>Financial Management: Text and Problems by M.Y. Khan and P.K. Jain, Tata McGraw Hill, New Delhi</i> • <i>Financial Management: Theory and Practice by Prasanna Chandra, Tata McGraw Hill, New Delhi</i> • <i>Financial Management by I.M. Pandey, Vikas Publishing House, New Delhi</i> • <i>Financial Management by C. Paramasivan & T. Subramanian</i> • <i>Financial Management by IM Pandey</i> • <i>Financial Management by Ravi Kishor</i> • <i>Financial Management by Khan & Jain</i>

Choice Based Credit Grading and Semester System (CBCGS)

T.Y.B.Com. Accounting & Finance Semester –V Syllabus

To be implemented from the Academic year 2021-2022

1. Elective Courses (EC)

3. Taxation - IV (Indirect Taxes – II)

1	Preamble of the Syllabus
	<p>B.Com. in Accounting & Finance is an under graduation course of Department of B.Com. (Accounting & Finance), Changu Kana Thakur Arts, Commerce & Science College, New Panvel (Autonomous), Affiliated to University of Mumbai (MH). The course is designed to guide students of B.Com accounting and finance to learn how to pay tax and get refund of the same and to Understand basic Concepts & Principles of Custom Law understand legislation and administration of Foreign Trade Policy. The performance of the learners shall be evaluated into two components i.e. internal and external. The learner's performance shall be assessed by Internal Assessment with 40 marks and external assessment with 60 marks.</p>

2	Objectives of the Syllabus
•	To understand how to pay tax and get refund of the same.
•	To Understand basic Concepts & Principles of Custom Law
•	To understand the basic concept & objective concept related FTP

3	Course Outcomes
•	Learn to compute Payment of tax and refund
•	Understand legislation and administration of Foreign Trade Policy.
•	Understand the types of refund.

Detailed Syllabus		
Taxation - IV (Indirect Taxes – III)		
Sr. No.	Modules / Units	No. of Lectures
1	Payment of Tax and Refunds	08
	Payment of Tax, Interest and other Amounts, Interest on delayed Payment, TDS, TCS , Refund of tax, Refund in certain cases, Interest on delayed refunds	
2	Returns	08
	Types of Returns and Provisions relating to filing of Returns	
3	Accounts, Audit, Assessment and Records	08
	Accounts and other records, Period of retention of accounts, Electronic Way Bill Self-Assessment, Provisional Assessment, Scrutiny of Returns, Assessment of nonfilers of Returns, Assessment of Unregistered person, summary assessment in certain special cases, Audit by tax authorities, Special Audit.	
4	Custom Act –I	12
	Introduction to customs law including Constitutional aspects Levy of and exemptions from customs duties – All provisions including application of customs law, taxable event, charge of customs duty, exceptions to levy of customs duty, exemption from custom duty , Types of customs duties, Classification and valuation of imported and export goods	
5	Custom Act – II	12
	Import and Export Procedures – All import and export procedures including special procedures relating to baggage, goods imported or exported by post, stores Provisions relating to coastal goods and vessels carrying coastal goods Warehousing and Drawback, Refund of Export Duty and Import Duty (Sec.26 & 26 A)	
6	Foreign Trade Policy	12
	Introduction to FTP – legislation governing FTP, salient features of an FTP, Foreign Trade Policy 2015- 20, administration of FTP, contents of FTP, scope of FTP. Provision related to import and export of goods Basic concepts relating to export promotion schemes provided under FTP – Duty , Exemption & remission Schemes, Duty Free Import Authorization Scheme, Reward scheme, Export Promotion Capital Goods Scheme, EOU, STP, BTP AND EHTP scheme.	

Note: Relevant Law/statute/Rules in force in force on 1st April immediately preceding the commencement of Academic Year is applicable for ensuring examination after relevant year.

5	Reference Books
	Taxation - IV (Indirect Taxes – III)
	<ul style="list-style-type: none"> • <i>Indirect Taxes: Law and Practice by V.S. Datey, Taxmann</i> • <i>Indirect Taxes by V.S. Balchandra, Sultan Chand and Sons, New Delhi</i> • <i>GST Law & practice with Customs & FTP by V.S. Datey, Taxmann</i> • <i>GST by V.S. Datey, Taxmann</i> • <i>GST & customs Law by K.M. Bansal, University Edition</i> • <i>GST Law & practice with Customs & FTP by VineetSodhani, Snow White Publications</i> • <i>GST Law & practice with Customs & FTP by Sanjiv Agarwal, Snow White Publications</i> • <i>Indirect taxes(Containing GST, Customs & FTP) by MOhd. Rafi, Bharat Publications</i>

Choice Based Credit Grading and Semester System (CBCGS)**T.Y.B.Com. Accounting & Finance Semester –VI Syllabus****To be implemented from the Academic year 2021-2022****1. Elective Courses (EC)****4. Security Analysis and Portfolio Management**

1	Preamble of the Syllabus
	<p>B.Com. in Accounting & Finance is an under graduation course of Department of B.Com. (Accounting & Finance), Changu Kana Thakur Arts, Commerce & Science College, New Panvel (Autonomous), Affiliated to University of Mumbai (MH). The course is designed to guide students of B.Com accounting and finance to provide financial theory and the analytical tools needed to make good investment decisions, analyse and evaluate the performance of an investment manager & analyze bond portfolio management strategies. The performance of the learners shall be evaluated into two components i.e. internal and external. The learner's performance shall be assessed by Internal Assessment with 40 marks and external assessment with 60 marks.</p>

2	Objectives of the Syllabus
•	To examine the determinants and behavior of asset prices
•	To provide financial theory and the analytical tools needed to make good investment decisions,
•	To model the relationship between risk and return, optimal portfolio selection, asset pricing models, market efficiency, portfolio performance evaluation, and the theory of active portfolio management.

3	Course Outcomes
•	Learn to describe the steps of the portfolio management process.
•	Understand investment policy recommendations, including the determination of an optimal asset allocation.
•	Learn to analyze and evaluate the performance of an investment manager.
•	Learn to analyze bond portfolio management strategies.
•	Understand the concept of market efficiency.

Detailed Syllabus		
Security Analysis and Portfolio Management		
Sr. No.	Modules/ Units	No. of Lectures
1	Portfolio Management – An Introduction & Process	08
	Investment - Meaning, Characteristics, Objectives, Investment V/s Speculation, Investment V/s Gambling and Types of Investors Portfolio Management – Meaning, Evolution, Phases, Role of Portfolio Managers, Advantages of Portfolio Management. Investment Environment in India and factors conducive for investment in India. Portfolio Analysis – Meaning and its Components, Calculation of Expected Return and Risk, Calculation of Covariance, Risk – Return Trade off. Portfolio Selection – Meaning, Feasible Set of Portfolios, Efficient Set of Portfolios, Selection of Optimal Portfolio, Markowitz Model, Limitations of Markowitz Model, Measuring Security Return and Portfolio Return and Risk under Single Index Model and Multi Index Model	
2	Portfolio Management – Valuation	10
	Portfolio Revision – Meaning, Need, Constraints and Strategies. Portfolio Evaluation – Meaning, Need, Measuring Returns (Sharpe, Treynor and Jensen Ratios) and Decomposition of Performance.	
3	Fundamental Analysis	10
	Economy Analysis – Meaning, Framework, Economic Analysis, Forecasting, Barometric or Indicator Approach, Econometric Model Building and Opportunistic Model Building. Industry Analysis – Concept of Analysis, Industry Life Cycle, Industry Characteristics Company Analysis – Financial Statements, Analysis of Financial Statements, (Practical questions on Debt equity ratios, total debt ratio, proprietary ratios, interest coverage ratio, Profitability ratios related to sales, investment and equity shares Efficiency or Activity Ratios) and Assessment of risk(Leverages)	
4	Technical Analysis	10
	Dow Theory; Meaning and Principles of Technical Analysis, Price Chart, Line Chart, Bar Chart, Japanese Candlestick Chart, Trends and Trend Reversals, Chart Patterns, Support and Resistance, Reversal Patterns, Continuation Patterns and Elliot Wave Theory Mathematical Indicators – Calculation of Moving Averages (Simple and Exponential Moving Average), Oscillators and Relative Strength Index Market Indicators; Fundamental Analysis V/s Technical Analysis	
5	Efficient Market Theory & CAPM	12
	Random Walk Theory , The Efficient Market Hypothesis Forms of Market Efficiency , Competitive Market Hypothesis CAPM – Fundamental Notions of Portfolio Theory, Assumption of CAPM, Efficient Frontier with Riskless Lending and Borrowing, Capital Market Line, Security Market Line and Pricing of Securities with CAPM. Arbitrage Pricing Theory (APT) – The Return Generating Model, Factors Affecting Stock Return, Expected Return on Stock, APT V/s CAPM.	
6	Valuation of equity	05
	Theory of Valuation. & Alternative Valuation Methods	
7	Securitization	05
	Introduction, concepts, benefits, participants, mechanism, pricing of securitization instruments	

5	Reference Books
	Security Analysis and Portfolio Management
•	<ul style="list-style-type: none">• <i>Blake, David 1992, Financial Market Analysis , McGraw Hill London</i>• <i>Francis J.C Investments, Analysis and Management McGraw Hill New York.</i>• <i>Pistolesse Clifford Using Technical Analysis Vision Books</i>• <i>Reilly Frank K and Keith Brown Investment Analysis and Portfolio Management.</i>

Choice Based Credit Grading and Semester System (CBCGS)

T.Y.B.Com. Accounting & Finance Semester –VISyllabus

To be implemented from the Academic year 2021-2022

1. Elective Courses (EC)

5.Management Control Systems

1	Preamble of the syllabus
	<p>B.Com. in Accounting & Finance is an under graduation course of Department of B.Com. (Accounting & Finance), Changu Kana Thakur Arts, Commerce & Science College, New Panvel (Autonomous), Affiliated to University of Mumbai (MH). The course is designed to guide students of B.Com accounting and finance to understand about the management control systems and Learners acquire the knowledge about various approaches of responsibility centre. Learners acquire the knowledge about various approaches of responsibility centre. The performance of the learners shall be evaluated into two components i.e. internal and external. The learner's performance shall be assessed by Internal Assessment with 40 marks and external assessment with 60 marks.</p>

2	Objectives of the course
•	To understand about the management control systems
•	To analysis of Incremental ROI, Sensitivity Analysis
•	To know about the approaches of Responsibility Centre
•	To understand the concept & methods of Inflation Accounting

3	Course outcomes
•	Learns would able to understand the management accounting & control systems
•	Understand analytical framework for Developing Responsibility Budget
•	Learners acquire the knowledge about various approaches of responsibility centre
•	Learners know about Financial Reporting to Management

4	Detailed Syllabus	
	Management Control Systems	
Sr. No.	Modules / Units	No. of Lectures
1	Developments in Management Accounting and Control Systems	15
	Introduction- The Modern economic environment, Traditional production processes, The background to change, The new manufacturing computer-aided design, Computer-aided manufacturing, Computer-integrated manufacturing, Flexible manufacturing systems, Value chain, Production operations systems and Management strategies, Material requirements planning, Manufacturing Resources Planning, Optimised Production Technology (OPT), ERP, CRM and SCM Just-in-time concept , Total Quality Management (TQM) and Synchronous Manufacturing. Control in special sectors: Scrap Control, Control of R & D – Project Control, Administrative Cost Control and the emphasis on continuous improvement.	
2	Financial Goal Setting	15
	Analysis of Incremental ROI, Sensitivity Analysis, Developing Financial Goals along Organizational Hierarchy. Concept and Technique of Responsibility Budgeting - Analytical framework for Developing Responsibility Budgets - Integrating Responsibility Budgets Integrating Responsibility Budgeting with MBO System.	
3	Responsibility Centres	15
	Introduction to Cost, Revenue, Profit and Investment Centres, Reporting of Responsibility Centre. Performance Measures -Investment Centres/Strategic Business Units, Return on Investment, The problems with ROI and Residual income (RI)	
4.	Inflation Accounting	15
	Introduction - Need, Brief History, Methods of Inflation Accounting (Current Purchasing Power and Current Cost Accounting), Inflation Accounting and Corporate Taxation. Financial Reporting to Management under conditions of change in price level.	

5	Reference Books
	Management Control Systems
	<ul style="list-style-type: none">• <i>Anthony & Govindrajana - Management Control Systems (TATA McGraw Hill), 12th Edition, 2006.</i>• <i>Bob Scarlett – Management Accounting and Performance Evaluation, Oxford Press, 2006 Edition</i>• <i>Maciaririllo & Kirby – Management Control Systems (Prentice Hall India), 2th Edition</i>

Choice Based Credit Grading and Semester System (CBCGS)

T.Y.B.Com. Accounting & Finance Semester – VI Syllabus

To be implemented from the Academic year 2021-2022

1. Elective Courses (EC)

6. Economics Paper – III (Indian Economy)

1	Preamble of the Syllabus
	<p>B.Com. in Accounting & Finance is an under graduation course of Department of B.Com. (Accounting & Finance), Changu Kana Thakur Arts, Commerce & Science College, New Panvel (Autonomous), Affiliated to University of Mumbai (MH). The course is designed to guide students of B.Com accounting and finance to acquire the knowledge of agricultural sector, analyse and learn about the growth & pattern of industrial sector. Learners know about service sector & industrial sector and also about money market and its progress. The performance of the learners shall be evaluated into two components i.e. internal and external. The learner's performance shall be assessed by Internal Assessment with 40 marks and external assessment with 60 marks.</p>

2	Objectives of the Syllabus
•	To acquire the knowledge of agricultural sector
•	To learn about the growth & pattern of industrial sector
•	To understand the various aspects of service sector
•	To know about money market, SEBI & policies

3	Course Outcomes
•	Learners would have acquired different aspects of agricultural sector
•	Learners understand the growth of industrial sector leads to development of economy
•	Learners know about service sector & industrial sector
•	Learners know about money market and its progress

4	Detailed Syllabus	
Economics Paper – III (Indian Economy)		
Sr. No.	Modules / Units	No. of Lectures
1	Introduction Agricultural Sector	15
	Introduction Demographic features- Poverty, Income inequality and Unemployment Urbanization and its effects Agricultural Sector Institutional Structure- Land reforms in India Technological changes in agriculture Agricultural pricing and agricultural finance Agricultural marketing National agricultural policy	
2	Industrial Sector	15
	Growth and pattern of industrialization Industrial Policy of 1991. Public sector enterprises and disinvestment policy Small scale sector- problems and prospects	
3	Service Sector and External Sector	15
	Service Sector Nature and scope of service industry Recent trends in Banking industry, Insurance Industry, Healthcare Industry and Tourism Industry External Sector Structure and directions of Foreign trade India's Balance of payments since 1991 FDI, foreign capital and transnational companies in India. Role and impact of SAARC, ASEAN and WTO	
4	Money and Banking	15
	Money market and its features Monetary policy of RBI Progress of commercial banking in India Development of capital markets SEBI and its functions	

5	Reference Books
	Economics Paper – III (Indian Economy)
•	<ul style="list-style-type: none">• <i>Indian Economic Survey Reports (Annual), Ministry of Finance, Government of India</i>• <i>Indian Economy by Misra and Puri, Himalaya Publishing House - Delhi</i>• <i>Gaurav Dutt&Ashwini Mahajan, (2016) Indian Economy, S.Chand& company PVT LTD New Delhi</i>• <i>A.N.Agarwal – Indian Economy problems of Development and Planning New Age International Publisher</i>• <i>RuddarDatt K.P.M Sundharam – Indian Economy S. Chand E-co LTD. Delhi</i>

Choice Based Credit Grading and Semester System (CBCGS)**T.Y.B.Com. Accounting & Finance Semester –V Syllabus****To be implemented from the Academic year 2021-2022****2. Core Courses (CC)****1. Financial Accounting – VII**

1	Preamble of the Syllabus
	<p>B.Com. in Accounting & Finance is an under graduation course of Department of B.Com. (Accounting & Finance), Changu Kana Thakur Arts, Commerce & Science College, New Panvel (Autonomous), Affiliated to University of Mumbai (MH). The course is designed to guide students of B.Com accounting and finance to understand the accounting for branches including foreign branches as well assets the knowledge of IFRS its Purpose & objectives of financial statement, its Frame work, its assumption, characteristics, element, recognition & measurement. Learn would have prepared final accounts of Co-Operative Housing Society & Consumer Co-Operative Society The performance of the learners shall be evaluated into two components i.e. internal and external. The learner's performance shall be assessed by Internal Assessment with 40 marks and external assessment with 60 marks.</p>

2	Objectives of the Syllabus
•	To know the importance of IFRS and Financial statement as per IFRS norms
•	To understand the allocation of profits and accounts of cooperative housing society
•	To formulate setting up of business in future, investment in share market, companies etc.
•	To enable students, understand the provisions of Indian Electricity Act, 2003 and double accounting system.
•	To understand the accounting for branches including foreign branches.

3	Course Outcomes
•	Understand the concept of IFRS its Purpose & Objective of financial statement, its Frame work, its assumption, characteristics, element, recognition & measurement.
•	Learn to prepare Final Accounts for Electricity Company as per Double Account System
•	Learn to prepare final accounts of Co-Operative Housing Society & Consumer Co-Operative Society.
•	Understand accounting of Foreign Branch and Conversion as per AS 11 and incorporation in HO accounts.

Detailed Syllabus		
Financial Accounting-VII		
Sr. No.	Modules / Units	No. Of Lectures
1	Final Account for Electricity Company	10
	Final Accounts as per Double Account System Final Accounts as per Electricity Rules; Receipt & Expenditure on Capital Account General Balance Sheet; Contingency Reserve; Depreciation; Debt Equity Ratio)for Tariff calculation); Reasonable Return Disposal of Surplus (As per Electricity Rules): Norms regarding Disposal of Surplus Replacement of Assets; Practical problems	
2	Final Accounts for Co-Operative Society: (Co-Operative Housing Society and Consumer Co-Operative Society)	15
	Provisions of Maharashtra State Co-Operative Societies Act and rules. Accounting provisions including appropriation to various funds; Format of Final Accounts – Form N practical problems on preparation of final accounts of a Co-Operative housing society & Consumer Co-Operative Society	
3	Investment Accounting (w.r.t. Accounting Standard - 13)	10
	For shares (variable income bearing securities) For debentures/Preference. shares (fixed income bearing securities) Accounting for transactions of purchase and sale of investments with ex and cum interest prices and finding cost of investment sold and carrying cost as per weighted average method (Excl. brokerage); Columnar format for investment account.	
4	Mutual Fund	05
	Introduction, Historical Background SEBI Guidelines, Organisation, NAC Scheme, Types of Mutual Fund Schemes, , FOF Scheme, Load or No-Load Scheme, Investment Valuation norms, Pricing of units, Contents of Balance sheet and revenue Account, Evaluation of mutual funds, Disposal of Investments, Recognition of Income, Accounting policies and entries.	
5	Introduction to IFRS and Indian Accounting Standards	08
	Accounting standards: Role/objectives of accounting standards, Development of accounting standards in India - Requirements of international accounting standards - International organizations engaged in accounting harmonization - IASB - FASB - Role of IASB in developing IFRS, Applicability, Interpretation, Scope and compliance of AS Indian Accounting standards (Ind AS) : Introduction, Road map, First time adaptation of Indian Accounting Standard, Conceptual framework ; Comparison of Ind AS, IFRS and AS IFRS : Introduction, scope Purpose & Objective of financial statement-its Frame work-its assumption, characteristics, element, recognition & measurement., first time adoption of IFRS Convergence of Ind-As and IFRS	
6	Accounting for Branches including Foreign Branches	12
	Introduction Classification of branches, Distinction between branch accounts and Departmental accounts, Dependent Branches, Method of Charging goods to branches, Accounting for Dependent branches, Accounting for independent branches, Adjustment and reconciliation of branch and head office accounts, Incorporation of branch balance in office books, Incomplete information in branch books, ForeignBranches, Accounting for Foreign Branches, Techniques for foreign currency translation.	

5	Reference Books
	Financial Accounting-VII
•	<ul style="list-style-type: none"> • <i>Introduction to Accountancy by T.S. Grewal, S. Chand and Company (P) Ltd., New Delhi</i> • <i>Advance Accounts by Shukla and Grewal, S. Chand and Company (P) Ltd., New Delhi</i> • <i>Advanced Accountancy by R.L Gupta and M. Radhaswamy, S. Chand and Company (P) Ltd., New Delhi</i> • <i>Modern Accountancy by Mukherjee and Hanif, Tata Mc. Grow Hill and Co. Ltd., Mumbai</i> • <i>Financial Accounting by LesileChandwichk, Pentice Hall of India Adin Bakley (P) Ltd., New Delhi</i> • <i>Financial Accounting for Management by Dr. Dinesh Harsalekar, Multi-Tech. Publishing Co. Ltd., Mumbai</i> • <i>Financial Accounting by P.C. Tulsian, Pearson Publications, New Delhi</i> • <i>Accounting Principles by R.N. Anthony and J.S. Reece, Richard Irwin, Inc</i> • <i>Financial Accounting by Monga, J.R. Ahuja, Girish Ahuja and Ashok Shehgal, Mayur Paper Back, Noida</i> • <i>Compendium of Statement and Standard of Accounting, ICAI</i> • <i>Indian Accounting Standards, Ashish Bhattacharya, Tata Mc. Grow Hill and Co. Ltd., Mumbai</i> • <i>Financial Accounting by Williams, Tata Mc. Grow Hill and Co. Ltd., Mumbai</i> • <i>Company Accounting Standards by ShrinivasanAnand, Taxman, New Delhi</i> • <i>Financial Accounting by V. Rajasekaran, Pearson Publications, New Delhi</i> • <i>Introduction to Financial Accounting by Horngren, Pearson Publications, New Delhi</i> • <i>Financial Accounting by M. Mukherjee and M. Hanif, Tata McGraw Hill Education Pvt. Ltd., New Delhi</i>

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**CHANGU KANA THAKUR
ARTS, COMMERCE & SCIENCE COLLEGE,
NEW PANVEL (AUTONOMOUS)**

**Re-accredited 'A+' Grade by NAAC
'College with Potential for Excellence' Status Awarded by
UGC**

'Best College Award' by University of Mumbai

**Department of Accounting & Finance
Board of Studies in Accounting & Finance**

**Program: B.Com. Accounting & Finance
Revised Syllabus of T.Y.B.Com. Accounting & Finance
(Sem. V & VI)**

**Choice Based Credit & Grading System (60:40)
w.e.f. Academic Year 2021-22**

T.Y.B.Com. Accounting & Finance – Sem. VI

**Project Work
Guidelines for Project Work**

Introduction

Inclusion of project work in the course curriculum of the B.Com. (Accounting & Finance) programme is one of the ambitious aspects in the programme structure. The main objective of inclusion of project work is to inculcate the element of research analyse and scientific temperament challenging the potential of learner as regards to his/ her eager to enquire and ability to interpret particular aspect of the study. It is expected that the guiding teacher should undertake the counselling sessions and make the awareness among the learners about the methodology of formulation, preparation and evaluation pattern of the project work.

There are two modes of preparation of project work

1. Project work based on research methodology in the study area
2. Project work based on internship in the study area

Guidelines for preparation of Project Work

1.General guidelines for preparation of project work based on Research Methodology

- The project topic may be undertaken in any area of Elective Courses.
- Each of the learner has to undertake a Project individually under the supervision of a teacher-guide.
- The learner shall decide the topic and title which should be specific, clear and with definite scope in consultation with the teacher-guide concerned.
- College shall allot a guiding teacher for guidance to the students based on her / his specialization.
- The project report shall be prepared as per the broad guidelines given below:
 - Font type: Times New Roman
 - Font size: 12-For content, 14-for Title
 - Line Space : 1.5-for content and 1-for in table work
 - Paper Size: A4
 - Margin : in Left-1.5, Up-Down-Right-1
 - The Project Report shall be bounded.
 - The project report should be 80 to 100 pages

Format

1st page (Main Page)

Title of the problem of the Project

**A Project Submitted to
Changu Kana Thakur Arts, Commerce & Science College,
New Panvel (Autonomous)
for partial completion of the degree of
Bachelor of Commerce (Accounting and Finance)
Under the Faculty of Commerce**

By

Name of the Learner

Under the Guidance of

Name of the Guiding Teacher

Name and address of the College

Month and Year

2nd Page

This page to be repeated on 2nd page (i.e. inside after main page)

On separate page

Index

Chapter No. 1 Title of the Chapter Page No.

(sub point 1.1, 1.1.1, And so on)

Chapter No. 2

Title of the Chapter

Chapter No. 3

Title of the Chapter

Chapter No. 4

Title of the Chapter

Chapter No. 5

Title of the Chapter

List of tables, if any, with page numbers.

List of Graphs, if any, with page numbers.

List of Appendix, if any, with page numbers.

Abbreviations used:

Structure to be followed to maintain the uniformity in formulation and presentation of Project Work

(Model Structure of the Project Work)

- **Chapter No. 1: Introduction**

In this chapter Selection and relevance of the problem, historical background of the problem, brief profile of the study area, definition/s of related aspects, characteristics, different concepts pertaining to the problem etc can be incorporated by the learner.

- **Chapter No. 2: Research Methodology**

This chapter will include Objectives, Hypothesis, Scope of the study, limitations of the study, significance of the study, Selection of the problem, Sample size, Data collection, Tabulation of data, Techniques and tools to be used, etc can be incorporated by the learner.

- **Chapter No. 3: Literature Review**

This chapter will provide information about studies done on the respective issue. This would specify how the study undertaken is relevant and contribute for value addition in information/ knowledge/ application of study area which ultimately helps the learner to undertake further study on same issue.

- **Chapter No. 4: Data Analysis, Interpretation and Presentation**

This chapter is the core part of the study. The analysis pertaining to collected data will be done by the learner. The application of selected tools or techniques will be used to arrive at findings. In this, table of information's, presentation of graphs etc. can be provided with interpretation by the learner.

- **Chapter No. 5: Conclusions and Suggestions**

In this chapter of project work, findings of work will be covered and suggestion will be enlisted to validate the objectives and hypotheses.

Note: If required more chapters of data analysis can be added.

- **Bibliography**

- **Appendix**

On separate page

Name and address of the college

Certificate

This is to certify that Ms/Mr _____ has worked and duly completed her/his Project Work for the degree of Bachelor in Commerce (Accounting & Finance) under the Faculty of Commerce in the subject of _____ and her/his project is entitled, “ _____ *Title of the Project* _____ ” under my supervision.

I further certify that the entire work has been done by the learner under my guidance and that no part of it has been submitted previously for any Degree or Diploma of any University/College/Institution.

It is her/ his own work and facts reported by her/his personal findings and investigations.

Name and Signature of Guiding Teacher



Date of submission:

On separate page

Declaration by learner

I the undersigned Miss / Mr. _____ *Name of the learner* hereby, declare that the work embodied in this project work titled “ _____ ”, *Title of the Project* forms my own contribution to the research work carried out under the guidance of _____ is a result of my own research work and has *Name of the guiding teacher* not been previously submitted to any other University/College/Institution for any other Degree/ Diploma to this or any other University. Wherever reference has been made to previous works of others, it has been clearly indicated as such and included in the bibliography.

I, here by further declare that all information of this document has been obtained and presented in accordance with academic rules and ethical conduct.

Name and Signature of the learner

Certified by

Name and signature of the Guiding Teacher

On separate page

Acknowledgment

(Model structure of the acknowledgement)

To list who all have helped me is difficult because they are so numerous and the depth is so enormous.

I would like to acknowledge the following as being idealistic channels and fresh dimensions in the completion of this project.

I take this opportunity to thank the **University of Mumbai & Changu Kana Thakur ACS College, New Panvel (Autonomous)** for giving me chance to do this project.

I would like to thank my **Principal**, _____ for providing the necessary facilities required for completion of this project.

I take this opportunity to thank our **Coordinator** _____, for her moral support and guidance.

I would also like to express my sincere gratitude towards my project guide _____ whose guidance and care made the project successful.

I would like to thank my **College Library**, for having provided various reference books and magazines related to my project.

Lastly, I would like to thank each and every person who directly or indirectly helped me in the completion of the project especially **myParents and Peers** who supported me throughout my project.

2. Guidelines for Internship based project work

- Minimum 20 days/ 100 hours of Internship with an Organisation/ NGO/ Charitable Organisation/ Private firm.
- The theme of the internship should be based on any study area of the elective courses
- Experience Certificate is Mandatory

A project report has to be brief in content and must include the following aspects:

- **Executive Summary:**

A bird's eye view of your entire presentation has to be precisely offered under this category.

- **Introduction on the Company:**

A Concise representation of company/ organization defining its scope, products/ services and its SWOT analysis.

- **Statement and Objectives:**

The mission and vision of the organization need to be stated enshrining its broad strategies.

- **Your Role in the Organisation during the internship:**

The key aspects handled, the department under which you were deployed and brief summary report duly acknowledged by the reporting head.

- **Challenges:**

The challenges confronted while churning out theoretical knowledge into practical world.

- **Conclusion:**

A brief overview of your experience and suggestions to bridge the gap between theory and practice.

- The project report based on internship shall be prepared as per the broad guidelines given below:
 - Font type: Times New Roman
 - Font size: 12-For content, 14-for Title
 - Line Space : 1.5-for content and 1-for in table work
 - Paper Size: A4
 - Margin : in Left-1.5, Up-Down-Right-1 ½ The Project Report shall be bounded.
 - The project report should be of minimum 50 pages

Evaluation pattern of the project work

The Project Report shall be evaluated in two stages viz.	
□Evaluation of Project Report (Bound Copy)	60 Marks
▪Introduction and other areas covered	20 Marks
▪Research Methodology, Presentation, Analysis and interpretation of data	30 Marks
▪Conclusion & Recommendations	10 Marks
□Conduct of Viva-voce	40 Marks
▪In the course of Viva-voce, the questions may be asked such as importance / relevance of the study, objective of the study, methodology of the study/ mode of Enquiry (question responses)	10 Marks
▪Ability to explain the analysis, findings, concluding observations, recommendation, limitations of the Study	20 Marks
▪Overall Impression (including Communication Skill)	10 Marks

Note: The guiding teacher along with the external evaluator appointed by the University/ College for the evaluation of project shall conduct the viva-voce examination as per the evaluation pattern

Passing Standard

- Minimum of Grade E in the project component
- In case of failing in the project work, the same project can be revised for ATKT examination.
- Absence of student for viva voce: If any student fails to appear for the viva voce on the date and time fixed by the department such student shall appear for the viva voce on the date and time fixed by the Department, such student shall appear for the viva voce only along with students of the next batch.

Choice Based Credit Grading and Semester System (CBCGS)**T.Y.B.Com. Accounting & Finance Semester –V &VI****To be implemented from the Academic year 2021-2022****Scheme of Evaluation****Scheme of examination for each semester**

The performance of the learners shall be evaluated into two components. The learner's performance shall be assessed by Internal Assessment with 40% marks in the first component. External assessment with 60% marks in the second component. The allocation of marks for the Internal Assessment and Semester End Examinations are as shown below:-

A) Internal Assessment: 40 %**40 Marks*****Internal Assessment- (Courses without Practical Courses)***

Sr. No.	Particular	Marks
01	One periodical class test / online examination to be conducted in the given semester	20 Marks
02	Any two tools out of these (10 Marks each) 1. Group/ Individual Project 2. Presentation and write up on the selected topics of the subjects. 3. Case studies /Test based on Tutorials 4. Open Book Test/Book Review 5. Quiz	20 Marks
	Total Marks	40 Marks

Internal Assessment-(Courses with Practical)

Sr. No.	Particular	Marks
01	Practical Examination	20 Marks
	Journal	05 Marks
	Viva Voce	05 Marks
	Laboratory Work	10 Marks
02	Any two tools out of these (10 Marks each) 1. Group/ Individual Project 2. Presentation and write up on the selected topics of the subjects / Case studies. 3. Test on Practical Skills 4. Open Book Test 5. Quiz	20 Marks
	Total Marks	40 Marks

Question Paper Pattern**(Periodical Class Test for the Courses at Under Graduate Programmes)**

Maximum Marks: 20

Questions to be set: 02

Duration: 40 Minutes

All Questions are Compulsory

Question No	Particular	Marks
Q-1	Match the Column / Fill in the Blanks / Multiple Choice Questions/ Answer in One or Two Lines (Concept-based Questions) (1 Marks / 2 Marks each)	10 Marks
Q-2	Answer in Brief (Attempt any Two of the Three) (5 Marks each)	10 Marks

B) Semester End Examination: 60 %**60 Marks**

- i) Duration: The examination shall be of 2 Hours duration
- ii) Theory question paper pattern
 - There shall be four questions each of 15 marks.
 - All questions shall be compulsory with internal choice within the questions.
 - Question may be subdivided into sub-questions a, b, c... and the allocation of marks depends on the weightage of the topic.

Question Paper Pattern (Practical Courses)

Maximum Marks: 60

Questions to be set: 04

Duration: 2 Hrs.

All Questions are Compulsory Carrying 15 Marks each.

Question No	Particular	Marks
Q-1	Full Length Practical Question OR	15 Marks
Q-1	Full Length Practical Question	15 Marks
Q-2	Full Length Practical Question OR	15 Marks
Q-2	Full Length Practical Question	15 Marks
Q-3	Full Length Practical Question OR	15 Marks
Q-3	Full Length Practical Question	15 Marks
Q-4	Objective Questions (*Multiple choice / True or False / Match the columns/Fill in the blanks/Short Questions.) OR	15 Marks
Q-4	Short Notes (Any three out of five)	15 Marks

Note:

The Practical question of 15 marks may be divided into two sub-questions of 7/8 and 10/5 Marks. If the topic demands, instead of practical questions, appropriate theory question maybe asked.

Question Paper Pattern (Theoretical Courses)

Maximum Marks: 60

Questions to be set: 04

Duration: 2 Hrs.

All Questions are Compulsory Carrying 15 Marks each.

Question No	Particular	Marks
Q-1	Full Length Question OR	15 Marks
Q-1	Full Length Question	15 Marks
Q-2	Full Length Question OR	15 Marks
Q-2	Full Length Question	15 Marks
Q-3	Full Length Question OR	15 Marks
Q-3	Full Length Question	15 Marks
Q-4	Objective Questions (*Multiple choice / True or False / Match the columns/Fill in the blanks/Short Questions.) OR	15 Marks
Q-4	Short Notes (Any three out of five)	15 Marks

Note:

Theory question of 15 marks may be divided into two sub-questions of 7/8 and 10/5 Marks.

Passing Standard

The learners to pass a course shall have to obtain a minimum of 40% marks in aggregate for each course where the course consists of Internal Assessment and Semester End Examination. The learners shall obtain a minimum of 40% marks (i.e. 16 out of 40) in the Internal Assessment and 40% marks in Semester End Examination (i.e. 24 Out of 60) separately, to pass the course and minimum of Grade E to pass a particular semester A learner will be said to have passed the course if the learner passes the Internal Assessment and Semester End Examination together.



**Janardan Bhagat Shikshan Prasarak Sanstha's
CHANGU KANA THAKUR
ARTS, COMMERCE & SCIENCE COLLEGE, NEW PANVEL
(AUTONOMOUS)**

**Re-accredited 'A+' Grade by NAAC
'College with Potential for Excellence' Status Awarded by UGC
'Best College Award' by University of Mumbai**

Program: B.Sc.

**Revised Syllabus of T. Y. B. Sc. Microbiology
(USc5Mi, USc6Mi)**

Choice Based Credit System (CBCS)

w. e. f. Academic Year 2019-20

PREAMBLE

The Choice Based Credit system was introduced by Mumbai University from 2016 - 2017. The process was initiated by restructuring the F. Y. B. Sc. syllabus and the paper pattern according to the CBCS pattern and its implementation in the same year i.e. 2016 - 17.

This was followed by revision of S. Y. B. Sc. syllabus and paper pattern in the year 2017 - 2018.

The revised S. Y. B. Sc. syllabus gave an opportunity to the Microbiology students to opt for Paper III of any subject other than Microbiology. Likewise S. Y. B. Sc. students of other subjects could opt for Microbiology Paper III. This gave them the option to choose from diversity of applied sciences.

In continuation with this, the T. Y. B. Sc. syllabus is being revised in the year 2018 - 2019. The existing paper pattern will also be accordingly revised.

Keeping in tune with the revised syllabus, the committee has ensured that there is a continuous flow of information and latest advances in the subject imparted to the students. Hence some of the modules of the earlier syllabus have been upgraded, while some new modules have been added to the syllabus in order to bridge the knowledge gap of the learner from S. Y. B. Sc. to T. Y. B. Sc.

The syllabus is aimed at equipping the students with basic knowledge in various branches of Microbiology such as Microbial Genetics, Molecular Biology, Virology, Medical Microbiology, Immunology, Microbial Biochemistry and Industrial Microbiology. Additionally, it also makes students aware of interdisciplinary sciences such as Bioinformatics and Bioinstrumentation.

In all, the students offering Microbiology as a single major subject that is Six units pattern, will study eight courses of theory and practical's compulsory during Semester V and Semester VI together, while students opting for double major subject that is Three units pattern, will have four courses of theory and practical's compulsory during Semester V and Semester VI together.

The courses for six units will comprise of the following:

- 1) USc5Mi-1 and USc6Mi-1
- 2) USc5Mi-2 and USc6Mi-2
- 3) USc5Mi-3 and USc6Mi-3
- 4) USc5Mi-4 and USc6Mi-4

The courses for three units will comprise of the following:

- 1) USc5Mi-1 and USc6Mi-1
- 2) USc5Mi-2 and USc6Mi-2

The approach towards designing this syllabus has been to retain the classic concepts of Microbiology as well as keeping abreast with the latest discoveries in Microbiology and other interdisciplinary fields.

In conclusion, the revised syllabus aims at inculcating a spirit of learning and kindling curiosity towards the subject in the minds of learners, resulting in their pursuit of higher education in Microbiology.

T. Y. B. Sc. MICROBIOLOGY THEORY (SEMESTER V)

Course Code	TOPIC HEADINGS	Credits & Lectures /Semester
USc5Mi1	Microbial Genetics	2.5 60 Lectures
Unit I	DNA Replication	15
Unit II	Transcription, Genetic Code & Translation	15
Unit III	Mutation and Repair	15
Unit IV	Genetic Exchange & Homologous Recombination	15

USc5Mi2	Medical Microbiology & Immunology: Part - I	2.5 60 Lectures
Unit I	Bacterial Strategies for Evasion and Study of a Few Diseases	15
Unit II	Study of a Few Diseases with Emphasis on Cultural Characteristics of the Etiological agent, Pathogenesis, Laboratory Diagnosis and Prevention	15
Unit III	General Immunology – I	15
Unit IV	General Immunology - II	15

USc5Mi3	Microbial Biochemistry: Part - I	2.5 60 Lectures
Unit I	Biological Membranes & Transport	15
Unit II	Bioenergetics & Bioluminescence	15
Unit III	Methods of Studying Metabolism & Catabolism of Carbohydrates	15
Unit IV	Fermentative Pathway & Anabolism of Carbohydrates	15

USc5Mi4	Bioprocess Technology: Part - I	2.5 60 Lectures
Unit I	Upstream Processing - I	15
Unit II	Upstream Processing - II	15
Unit III	Fermentation Modes, Equipments and Instruments	15
Unit IV	Traditional Industrial Fermentations	15

N.B.

I. Each theory period shall be of 48 minutes duration. Theory component shall have 240 instructional periods plus 240 notional periods per semester which is equal to 384 learning hours. For theory component the value of One Credit is equal to 38.40 learning hours.

II. Each practical period shall be of 48 minutes duration. Practical component shall have 240 instructional periods plus 60 notional periods per semester which is equal to 240 learning hours. For practical component the value of One Credit is equal to 40 learning hours.

T.Y.B.SC. MICROBIOLOGY THEORY (SEMESTER V)

MICROBIAL GENETICS (USc5Mi-1)

LEARNING OBJECTIVES

Microbial Genetics (USc5Mi1) is a course in Genetics for T. Y. B. Sc. undergraduate students in Semester V that deals with various concepts of Genetics.

The learning objectives include the following:

1. DNA Replication: The learner will understand the events occurring in both Prokaryotic and Eukaryotic DNA replication, with a focus on the involvement of Proteins and Enzymes at the cellular level. The topic will also include the assembly of Eukaryotic chromosome.
2. Transcription, Genetic Code and Translation: This module aims at the learner understanding the basis of gene expression and the Central Dogma and the molecular basis of protein synthesis in Prokaryotes and Eukaryotes. The module deals with the structure and properties of different forms of RNA, maturation of RNA and RNA splicing.
3. Mutation and DNA repair: The molecular basis and types of mutation, their cause, effect and DNA repair is studied. The basic concepts related to molecular biology are explained.
4. Genetic exchange: This module includes the study of various mechanisms of gene transfer in bacteria. It also provides insight into the mechanisms of genetic recombination. The module deals with the Genetics of bacteria and bacteriophages, development of new strains and genetic mapping.
5. Practicals The laboratory techniques and experiments based on these topics will give students hands on competence in fundamental molecular biology experiments.

LEARNING OUTCOMES:

- DNA Replication: The learner will understand the sequence of events, mechanism, enzymes and proteins involved in replication of DNA in prokaryotes and eukaryotes.
- Transcription, Genetic Code and Translation: The student will know the central dogma of biology its two-step transcription and translation, maturation of RNA.
- Mutation and DNA repair: The learner will know the concept of mutation, its types, causes and their effects. This module will also make them understand types of mutagens, damage to DNA due to mutagenesis, various mechanisms of DNA repair.
- Genetic exchange: The student shall understand the various mechanisms of gene transfer in bacteria and genetic recombination.
- Practicals: The students will acquire skill to perform the laboratory techniques and experiments based on the above topics.

MICROBIAL GENETICS (USc5Mi-1): DETAIL SYLLABUS

Title	Lectures / Semester	Notional Periods
Unit I: DNA Replication	15 L	15
1.1. Historical perspective - Conservative, dispersive, semi-conservative, bidirectional and semi-discontinuous, Theta model of replication.	3 L	
1.2. Prokaryotic DNA replication - Details of molecular mechanisms involved in Initiation, Elongation and Termination	4 L	
1.3. Enzymes and proteins associated with DNA replication- Primase, Helicase, Topoisomerase, SSB, DNA polymerases, Ligases, Ter and Tus proteins.	3 L	
1.4. Eukaryotic DNA replication - Molecular details of DNA synthesis, replicating the ends of the chromosomes assembling newly replicated DNA into nucleosomes.	4 L	
1.5. Rolling circle mode of DNA replication	1 L	
Unit II: Transcription, Genetic Code and Translation	15 L	15
2.1 Central Dogma: An Overview, Transcription process, Transcription in bacteria - Initiation of transcription at promoters, elongation of an RNA chain, termination of an RNA chain	3 L	
2.2 Transcription in Eukaryotes - Eukaryotic RNA polymerase, Transcription of protein- coding genes by RNA polymerase II, Transcription initiation, The structure and production of Eukaryotic mRNAs, Production of mature mRNA in Eukaryotes, Processing of Pre-mRNA to mature mRNA. Self Splicing of Introns, RNA editing	5 L	
2.3 Genetic code - Nature of genetic code and characteristics of genetic code.	2 L	
2.4 Translation process - Transfer RNA, structure of tRNA, tRNA genes, Recognition of the tRNA anticodon by the mRNA codon, Adding of amino acid to tRNA , Ribosomal RNA and Ribosomes, Ribosomal RNA Genes, Initiation of translation, Initiation in Bacteria, Initiation in eukaryotes, Elongation of the polypeptide chain, termination of translation, protein sorting in the cell.	5 L	
	1 L	
Unit III: Transcription, Genetic Code and Translation	15 L	15
3.1 Mutation		
3.1.1 Terminology: alleles, homozygous, heterozygous, genotype, phenotype, Somatic mutation, Germline mutation, Gene mutation, Chromosome mutation, phenotypic lag, hotspots and mutator genes	1 L	

3.1.2	Fluctuation test.	1 L	
3.1.3	Types of mutations: Point mutation, reverse mutation, suppressor mutation, frameshift mutation, conditional lethal mutation, base pair substitution, transition, transversion, missense mutation, nonsense mutation, silent mutation, neutral mutation, pleiotropic mutations.	3 L	
3.1.4	Causes of mutation: Natural/spontaneous mutation--replication error, depurination, deamination. Induced mutation: principle and mechanism with illustrative diagrams for: 3.1.4.1 Chemical mutagens - base analogues, nitrous acid, hydroxyl amine, intercalating agents and alkylating agents. 3.1.4.2 Physical mutagen 3.1.4.3 Biological mutagen (only examples)	4 L	
3.1.5	Ames test	1 L	
3.1.6	Detection of mutants	1 L	
3.2	DNA Repair	4 L	
3.2.1	Mismatch repair,		
3.2.2	Light repair		
3.2.3	Repair of alkylation damage		
3.2.4	Base excision repair		
3.2.5	Nucleotide excision repair		
3.2.6	SOS repair		
Unit IV: Genetic Exchange & Homologous Recombination		15 L	15
4.1	Genetic analysis of Bacteria	1 L	
4.2	Gene transfer mechanisms in bacteria		
4.2.1	Transformation	3 L	
4.2.1.1	Introduction and History		
4.2.1.2	Types of transformation in prokaryotes--Natural transformation in <i>Streptococcus pneumoniae</i> , <i>Haemophilus influenzae</i> , and <i>Bacillus subtilis</i> .		
4.2.1.3	Mapping of bacterial genes using transformation.		
4.2.1.4	Problems based on transformation.		
4.2.2	Conjugation	5 L	
4.2.2.1	Discovery of conjugation in bacteria		
4.2.2.2	Properties of F plasmid/Sex factor		
4.2.2.3	The conjugation machinery		
4.2.2.4	Hfr strains, their formation and mechanism of conjugation		
4.2.2.5	F' factor, origin and behavior of F' strains,		

Sexduction.		
4.2.2.6 Mapping of bacterial genes using conjugation (Wolman and Jacob experiment).		
4.2.2.7 Problems based on conjugation		
4.2.3 Transduction		
4.2.3.1 Introduction and discovery	3 L	
4.2.3.2 Generalized transduction		
4.2.3.3 Use of Generalized transduction for mapping genes		
4.2.3.4 Specialized transduction		
4.2.3.5 Problems based on transduction		
4.3 Recombination in bacteria	3 L	
4.3.1 General/Homologous recombination		
4.3.2 Molecular basis of recombination		
4.3.3 Holliday model of recombination (Single strand DNA break model only)		
4.3.4 Enzymes required for recombination		
4.3.5 Site –specific recombination		

MEDICAL MICROBIOLOGY & IMMUNOLOGY: PART-I (USc5Mi2)

LEARNING OBJECTIVES

The course in medical microbiology has been designed to help students to build on the basic information regarding host defense mechanisms that they have gained in S. Y. B. Sc. It has been designed to highlight the most important areas of medical microbiology i.e. etiology, transmission, pathogenesis, clinical manifestations, laboratory diagnosis, prophylaxis, and treatment of various diseases

The students have achieved a basic understanding of Innate Immunity and Host Defense mechanisms in their lower classes and Immunology that forms an integral part of Medical Microbiology has been designed to help understand the ability of our immune system to defend against invading pathogens in a logical fashion. This includes our ability to defend against microorganisms by understanding the concepts of Humoral and Cellular Immunity (innate immunity); if we react excessively, what price we pay (hypersensitivity); and very importantly, how we can prevent pathogens from infecting us (vaccination).

LEARNING OUTCOMES:

The students should be able to

- Give details of the virulence factors and other features of the pathogen
- Correlate these virulence factors with the pathogenesis and clinical features of the disease
- Comment on the mode of transmission, and therefore modes of prophylaxis of these diseases
- Comment on the methods of diagnosis of the disease.
- Conceptualize how the adaptive immune responses coordinate to fight invading pathogens and the organs and tissue involved
- Discuss the role of antigen in initiating the immune response
- Correlate the structure & functions of immunoglobulin

- Understand the importance of cytokines, MHC, APCs, Cytokines, and the role in adaptive immunity.
- Understand the various antigen –antibody reactions

MEDICAL MICROBIOLOGY AND IMMUNOLOGY: PART I
(USc5Mi2): DETAIL SYLLABUS

Title	Lectures / Semester	Notional Periods
Unit I: Bacterial Strategies for Evasion and Study of a Few Diseases	15 L	15
1.1. Study of virulence mechanisms in bacteria	5 L	
1.1.1. Pathogenicity islands		
1.1.2. Bacterial virulence factors		
1.1.2.1. Adherence factors		
1.1.2.2. Invasion of host cells and tissues		
1.1.3. Toxins		
1.1.3.1. Exotoxins		
1.1.3.2. Exotoxins associated with diarrhoeal diseases and food poisoning		
1.1.3.3. LPS of gram negative bacteria		
1.1.4. Enzymes		
1.1.4.1. Tissue degrading enzymes		
1.1.4.2. IgA1 proteases		
1.1.5. Antiphagocytic factors		
1.1.6. Intracellular pathogenicity		
1.1.7. Antigenic heterogeneity		
1.1.8. The requirement for iron		
1.2. Study of A Few Infectious Diseases of the Respiratory Tract (wrt. Cultural Characteristics of the etiological agent, pathogenesis & clinical features, laboratory diagnosis, treatment and prevention only)	8 L	
1.2.1. <i>S. pyogenes</i> infections		
1.2.2. Influenza		
1.2.3. Tuberculosis		
1.2.4. Pneumonia caused by <i>K. pneumoniae</i>		
1.3. Study of urinary tract infections	2L	
Unit II: Study of few diseases (wrt. Cultural characteristics of the etiological agent, pathogenesis & clinical features, laboratory diagnosis, treatment and prevention only)	15 L	15
2.1 Study of skin infections	7 L	
2.1.1 Pyogenic skin infections caused by <i>Pseudomonas</i> and <i>S. aureus</i>		
2.1.2 Leprosy		
2.1.3 Fungal infections- Candidiasis		
2.1.4 Viral Infections- Herpes simplex		
2.2 Study of gastrointestinal tract infections	8 L	
2.2.1 Infections due to Enteropathogenic <i>E.coli</i> strains		
2.2.2 Enteric fever- <i>Salmonella</i>		
2.2.3 Shigellosis		
2.2.4 Rotavirus diarrhoea		
2.2.5 Dysentery due to <i>Entamoeba histolytica</i>		

Unit IV: General Immunology – II		15 L	15
4.1 Cytokines		2 L	
4.1.1	Concepts - cytokines, lymphokines, monokines, interleukines, chemokines.		
4.1.2	Properties of cytokines		
4.1.3	Attributes of cytokines		
4.1.4	Biological functions of cytokines		
4.2 Major histocompatibility complex		3 L	
4.2.1	Introduction		
4.2.2	Three major classes of MHC encoded molecules		
4.2.3	The basic structure and functions of Class I and Class II MHC Molecules		
4.2.4	Peptide binding by Class I and Class II MHC molecule		
4.3 Antigen presenting cells		3 L	
4.3.1	Types of APC's		
4.3.2	Endogenous antigens: The cytosolic pathway		
4.3.3	Exogenous antigens: The endocytic pathway		
4.4 Antigen Antibody reactions		7 L	
4.4.1	Precipitation reaction - Immunelectrophoresis		
4.4.2	Agglutination reactions - haeme-agglutination, bacterial agglutination, passive agglutination, agglutination inhibition.		
4.4.3	Radioimmunoassay (RIA),		
4.4.4	Enzyme Linked Immunosorbent Assay - indirect, competitive and sandwich ELISA		
4.4.5	Immunofluorescence- Direct and indirect.		
4.4.6	Western blotting.		

MICROBIAL BIOCHEMISTRY: PART-I (USc5Mi3)

LEARNING OBJECTIVES

This course is designed for T. Y. B. Sc. students who choose to major in Microbiology. Biochemistry is the branch of science that explores the chemical processes that take place inside all living things, from bacteria to plants and animals. It is a laboratory based science that brings together biology and chemistry, by using chemical knowledge and techniques to help understand and solve biological problems. Microbial physiology is best understood with knowledge of biochemistry. The course thus focuses on the need to study uptake, various intermediary metabolic processes and methods to study metabolism both invitro as well as *in vivo*. The course is designed to expose students to carbohydrate metabolism as also understand the principles of energy generation by different physiological groups of organisms. The advanced area of bioenergetics unfolds the universal mechanisms of energy generation by using electron transport systems and gaining knowledge of energy conservation. The student is also learning anabolic processes through concepts of biosynthesis, and polymerization namely glycogen and peptidoglycan biosynthesis.

LEARNING OUTCOMES:

The students should be able to

- Understand the architecture of the membrane and how solute is transported inside the cell.
- Describe and explain the electron transport chains in prokaryotes and mitochondria and understand the mechanism of ATP synthesis.
- Explain bioluminescence mechanism and its significance
- Discuss the experimental aspect of studying catabolism and anabolism and the various pathways for the breakdown of carbohydrates along with reactions in amphibolic pathways.
- Describe various other pathways which produce different end products.
- Describe anabolic reactions in carbohydrate synthesis.
- Apply the concepts of energetics and catabolism in biodegradation of various substrates.

MICROBIAL BIOCHEMISTRY: PART-I: (USc5Mi3):

DETAIL SYLLABUS

Title		Lectures / Semester	Notional Periods
Unit I: Biological Membranes & Transport		15 L	15
1.1	Composition and architecture of membrane	2 L	
1.1.1	Lipids and properties of phospholipid membranes		
1.1.2	Integral & peripheral proteins & interactions with lipids		
1.1.3	Permeability		

<p>1.1.4 Aquaporins 1.1.5 Mechanosensitive channels</p> <p>1.2 Methods of studying solute transport 1.2.1 Use of whole cells 1.2.2 Liposomes 1.2.3 Proteoliposomes</p> <p>1.3 Solute transport across membrane 1.3.1 Passive transport and facilitated diffusion by membrane proteins 1.3.2 Co-transport across plasma membrane - (Uniport, Antiport, Symport) 1.3.3 Active transport & electrochemical gradient 1.3.4 Ion gradient provides energy for secondary active transport 1.3.4.1 Lactose transport 1.3.5 ATPases and transport (only Na-K ATPase) 1.3.6 Shock sensitive system – Role of binding proteins 1.3.6.1 Maltose uptake (Diagram and description) 1.3.6.2 Histidine uptake (Diagram and description) 1.3.7 Phosphotransferase system 1.3.8 Schematic representation of various membrane transport systems in bacteria.</p> <p>1.4 Other examples of solute transport:</p>	<p>2 L</p> <p>8 L</p> <p>3 L</p>	
<p>1.4.1 Iron transport: A special problem 1.4.2 Assembly of proteins into membranes and protein export 1.4.3 Bacterial membrane fusion central to many biological processes</p>		
<p style="text-align: center;">Unit II: Bioenergetics & Bioluminescence</p> <p>2.1 Biochemical mechanism of generating ATP: Substrate-Level-Phosphorylation, Oxidative Phosphorylation & Photophosphorylation</p> <p>2.2 Electron transport chain 2.2.1 Universal Electron acceptors that transfer electrons to E.T.C. 2.2.2 Carriers in E.T.C. 2.2.2.1 Hydrogen carriers – Flavoproteins, Quinones 2.2.2.2 Electron carriers – Iron Sulphur proteins, Cytochromes. 2.2.3 Mitochondrial ETC 2.2.3.1 Biochemical anatomy of mitochondria 2.2.3.2 Complexes in Mitochondrial ETC 2.2.3.3 Schematic representation of Mitochondrial ETC.</p> <p>2.3 Prokaryotic ETC 2.3.1 Organization of electron carriers in bacteria 2.3.1.1 Generalized electron transport pathway in</p>	<p>15 L</p> <p>1 L</p> <p>3 L</p> <p>3 L</p>	<p>15</p>

<p style="text-align: center;">bacteria</p> <p>2.3.1.2 Different terminal oxidases</p> <p>2.3.2 Branched bacterial ETC</p> <p>2.3.3 Pattern of electron flow in <i>E. coli</i> - aerobic and anaerobic</p> <p>2.3.4 Pattern of electron flow in <i>Azotobacter vinelandii</i></p> <p>2.4 ATP synthesis</p> <p>2.4.1 Explanation of terms – Proton motive force, Proton pump, Coupling sites, P:O ratio, Redox potential (definition of Standard reduction potential)</p> <p>2.4.2 Free energy released during electron transfer from NADH to O₂</p> <p>2.4.3 Chemiosmotic theory (only explanation)</p> <p>2.4.4 Structure & function of Mitochondrial ATP synthase</p> <p>2.4.5 Structure of bacterial ATP synthase</p> <p>2.4.6 Mechanism by Rotational catalysis</p> <p>2.4.7 Inhibitors of ETC, ATPase and uncouplers</p>	3 L	
<p>2.5 Other modes of generation of electrochemical energy</p> <p>2.5.1 ATP hydrolysis</p> <p>2.5.2 Oxalate formate exchange</p> <p>2.5.3 End product efflux, Definition, Lactate efflux</p> <p>2.5.4 Bacteriorhodopsin: - Definition, function as proton pump and significance</p> <p>2.6 Bioluminescence</p> <p>2.6.1 Brief survey of bioluminescent systems</p> <p>2.6.2 Biochemistry of light emission</p> <p>2.6.3 Schematic diagram</p> <p>2.6.4 Significance / Application</p>	2 L	
<p>Unit III: Studying Metabolism & Catabolism of Carbohydrates</p> <p>3.1 Experimental Analysis of metabolism</p> <p>3.1.1 Goals of the study</p> <p>3.1.2 Levels of organization at which metabolism is studied</p> <p>3.1.3 Metabolic probes.</p> <p>3.1.4 Use of radioisotopes in biochemistry</p> <p style="padding-left: 20px;">3.1.4.1 Pulse labeling</p> <p style="padding-left: 20px;">3.1.4.2 Assay and study of radiorespirometry to differentiate EMP & ED</p> <p>3.1.5 Use of biochemical mutants</p> <p>3.1.6 Sequential induction</p>	15 L	15
<p>3.2 Catabolism of Carbohydrates</p> <p>3.2.1 Breakdown of polysaccharides – Glycogen, Starch, Cellulose</p> <p>3.2.2 Breakdown of oligosaccharides - Lactose, Maltose, Sucrose, Cellobiose.</p> <p>3.2.3 Utilization of monosaccharides - Fructose, Galactose</p> <p>3.2.4 Major pathways – (with structure and enzymes)</p>	10 L	

3.2.4.1	Glycolysis (EMP)		
3.2.4.2	HMP Pathway - Significance of the pathway		
3.2.4.3	ED pathway		
3.2.4.4	TCA cycle - Action of PDH, Significance of TCA		
3.2.4.5	Incomplete TCA in anaerobic bacteria		
3.2.4.6	Anaplerotic reactions		
3.2.4.7	Glyoxylate bypass		
3.3	Amphibolic role of EMP; Amphibolic role of TCA cycle	1 L	
3.4	Energetics of Glycolysis, TCA and ED pathway – Balance sheet only. Format as in Lehninger (2.5 ATP/NADH and 1.5 ATP / FADH ₂) (Based on this format make balance sheet for Glycolysis - Lactic acid and Alcohol fermentation and for ED pathway)	1 L	
Unit IV: Fermentative Pathways & Anabolism of Carbohydrates		15 L	15
4.1	Fermentative pathways (with structures and enzymes)	4 L	
4.1.1	Lactic acid fermentation		
4.1.1.1	Homofermentation		
4.1.1.2	Heterofermentation		
4.1.2	Bifidum pathway		
4.1.3	Alcohol fermentation		
4.1.3.1	By ED pathway in bacteria		
4.1.3.2	By EMP in yeasts		
4.2	Other modes of fermentation in microorganisms	5 L	
4.2.1	Mixed acid		
4.2.2	Butanediol		
4.2.3	Butyric acid		
4.2.4	Acetone-Butanol		
4.2.5	Propionic acid (Acrylate and succinate propionate pathway)		
4.3	Anabolism of Carbohydrates	6 L	
4.3.1	General pattern of metabolism leading to synthesis of a cell from glucose		
4.3.2	Sugar nucleotides		
4.3.3	Gluconeogenesis (only bacterial)		
4.3.4	Biosynthesis of glycogen		
4.3.5	Biosynthesis of Peptidoglycan		

BIOPROCESS TECHNOLOGY: PART-I (USc5Mi4)

LEARNING OBJECTIVES

Bioprocess Technology I course is designed to develop the learner's ability to study the techniques used in the different phases of industrial microbiology such as strain improvement, basic fermentation equipment & its sterilization aspects. It gives an in depth focus of the different types of fermenters used in industry for production of different products, and also emphasizes its process parameters. It includes the principles and describes the main steps and processes in the industrial production of beverages and enzymes. Industrial microbiology becomes an important application based paper covering microbial fermentations. Thus, it becomes a laboratory to market scenario where the entire products reach. The learner is provided with the details of productions of important traditional fermentation products like wine, beer, vinegar and enzymes. Thus, this paper readies the learner to understand and apply the knowledge of fermentation technology and

related products. This course aims to enable graduates to enter industry with an appropriate level of understanding of the need for both the science and business aspects to be achievable to make a viable product and enhance their entrepreneur skills.

LEARNING OUTCOMES:

The students should be able to

- Describe the applications of microbes and its strain improvement in Industrial Microbiology.
- Apply kinetic formula to determine growth and productivity parameters of batch continuous, fed batch and solid substrate fermentations
- Describe the design of bioreactors for different applications and its process parameters
- Design media, growth conditions and techniques for producing and recovering different types of products of commercial value.
- Learner will be well –versed with the containment and levels of containment.

BIOPROCESS TECHNOLOGY: PART-I

(USc5Mi4): DETAIL SYLLABUS

Title	Lectures / Semester	Notional Periods
Unit I: Upstream Processing – I	15 L	15
1.1 Introduction	3 L	
1.1.1 An introduction to fermentation processes		
1.1.2 The range of fermentation processes		
1.1.3 The Component parts of a fermentation process		
1.2 Screening methods	3 L	
1.2.1 Primary and secondary screening		
1.2.2 High throughput screening methods		
1.3 Strain improvement	6 L	
1.3.1 The improvement of industrial microorganisms		
1.3.2 The selection of induced mutants synthesizing improved levels of primary metabolites		
1.3.3 The isolation of induced mutants producing improved yields of secondary metabolites.		
1.3.4 The improvement of strains by modifying properties other than the yield of product		
1.4 Preservation of cultures	3 L	
1.4.1 Preservation of industrially important organisms		
1.4.2 Quality control of preserved stock		
1.4.2.1 Key Criteria's		
1.4.2.2 Development of a master culture bank (MCB)		
1.4.2.3 Variability test to ensure reproducibility of the MCB		

Unit II: Upstream Processing – II		15 L	15
2.1 Fermentation media formulation and raw materials		4 L	
2.1.1 Media formulation			
2.1.2 Raw materials for fermentation media			
2.3 The development of inocula for industrial fermentations		3 L	
2.2.1 Introduction			
2.2.2 Development of inocula for unicellular bacterial process			
2.2.3 Development of inocula for mycelial process			
2.3 Sterilization and achievement of aseptic conditions		6 L	
2.3.1 Introduction			
2.3.2 Medium sterilization (concept of nabra factor)			
2.3.3 Methods of batch sterilization			
2.3.4 The design of continuous sterilization process			
2.3.5 Sterilization of the Fermenter			
2.3.6 Sterilization of the Feeds			
2.3.7 Sterilization of the liquid wastes			
2.3.8 Filter Sterilization			
2.3.8.1 Filter sterilization of fermentation media,			
2.3.8.2 Filter sterilization of air			
2.3.8.3 Filter sterilization of fermenter exhaust air			
2.3.9 Achievement of aseptic conditions			
2.4 Scale up and scale down of fermentation		2 L	
Unit III: Fermentation Modes, Equipments and Instruments		15 L	15
3.1 Modes of fermentation		3 L	
3.1.1 Batch, continuous and fed batch fermentation			
3.1.2 Solid substrate fermentation			
3.2 Design of fermenter		7 L	
3.2.1 Basic functions			
3.2.2 Aseptic operation & Containment			
3.2.3 Body construction			
3.2.4 Agitator (impeller) – function, types, mechanical seal and magnetic drive			
3.2.5 Baffles			
3.2.6 The aeration system (sparger) - function and types			
3.2.7 Valves (Globe, piston & needle)			
3.2.8 Steam traps			
3.2.9 Examples of fermenters - Stirred Tank Reactor, Air Lift, Deep Jet, Photobioreactor			
3.3 Instrumentation and control		5 L	
3.3.1 Introduction to sensors and its types			
3.3.2 Measurement and control of: pH, temperature, pressure, foam sensing, dissolved oxygen, inlet and exit gas analysis.			

Unit IV: Traditional Fermentations	15 L	15
4.1 Wine – Red, White, Champagne and Sherry: Alcoholic fermentation, composition of grape juice, Sulphur dioxide addition, factors affecting wine fermentation, examples and role of yeasts involved in fermentation, malolactic fermentation, technological aspects of wine making- red, white, champagne, sherry, examples of aroma compounds of wine, types and examples of wine	3 L	
4.2 Beer – Ale and Lager: Elements of brewing process, process details, use of cylindro-conical vessel, primary fermentation, continuous fermentation, aging and finishing, yeasts involved in fermentation.	3 L	
4.3 Alcohol from Molasses: Introduction, biosynthesis of ethanol, production process- preparation of nutrient solution, fermentation, recovery by distillation.	2 L	
4.4 Vinegar (acetic acid): Introduction, biosynthesis, production using generator, production using submerged fermenter, recovery.	3 L	
4.5 Baker's yeast: Outline of production, yeast strains and their properties, factors important in production-oxygen requirement and aeration, concentration of sugar, pH, temperature, preparation of substrate, fermentation, harvesting of yeast cells, production of compressed and active dry yeast.	2 L	
4.6 Fungal amylase production: α amylase- production from bacteria and fungi, β amylase and glucoamylase, concentration and purification.	2 L	

T. Y. B. Sc. MICROBIOLOGY PRACTICALS (SEMESTER-V)

Course Code: USc5Mi1 [Practicals Based on USc5Mi1, Credits -1.5, Lectures- 60, Notional Periods-15]

1. UV survival curve – determination of exposure time leading to 90% reduction
2. Isolation of mutants using UV mutagenesis
3. Gradient plate technique (dye resistant mutant)
4. Replica plate technique for selection & characterization of mutants – auxotroph & antibiotic resistant
5. Isolation and detection of plasmid DNA.

Course Code: USc5Mi2 [Practicals Based on USc5Mi2, Credits -1.5, Lectures-60, Notional Periods-15]

1. Acid fast staining.
2. Identification of Candida species using the germ tube test and growth on Chrom agar
3. To determine SLO and SLS activity of S .pyogenes
4. Study of standard cultures E. coli, Klebsiella spp., Proteus spp., Pseudomonas spp., Salmonella typhi, S. paratyphi A, S. paratyphi B, Shigella spp., S .pyogenes, S. aureus
5. Identification of isolates obtained from pus, sputum, stool and urine by morphological, cultural and biochemical properties.
6. Antigen Preparation: O & H antigen preparation of Salmonella. Confirmation by slide

agglutination

Course Code: USc5Mi3 [Practicals Based on USc5Mi3; Credits-1.5, Lectures- 60, Notional Periods-15]

1. Isolation and study of Bioluminescent organisms
2. Study of oxidative and fermentative metabolism
3. Qualitative and Quantitative assay of Phosphatase
4. Study of Homo – Hetero-fermentation
5. Isolation and detection of Mitochondria
6. Glucose detection by GOD/POD

Course Code: USc5Mi4 [Practicals Based on USc5Mi4, Credits -1.5, Lectures- 60, Notional Periods-15]

1. Alcohol Fermentation
 - 1.1. Preparation and standardization of yeast inoculums for alcohol fermentation
 - 1.2. Laboratory Alcohol fermentation using jaggery medium, calculation of efficiency of fermentation.
2. Determine the alcohol tolerance for yeast.
3. Determine the sugar tolerance for yeast.
4. Chemical estimation of sugar by Cole's ferricyanide method
5. Chemical estimation of alcohol
6. Production of amylase- detection, shake flask or solid substrate cultivation and detection (Qualitative).
7. Primary screening for antibiotic producers using Wilkin's agar overlay method.
8. Determination of antibiotic spectrum using agar strip / streak method.
9. Industrial Visit

TEXT BOOKS AND REFERENCE BOOKS

(SEMESTER V)

Course Code: USc5Mi1

Text books:

1. Peter J. Russell (2006), "I Genetics-A molecular approach", 2nd edition.
2. Benjamin A. Pierce (2008), "Genetics a conceptual approach", 3rd edition, W. H. Freeman and company.
3. R. H. Tamarin, (2004), "Principles of genetics", Tata McGraw Hill.
4. D.,Nelson and M.Cox, (2005), "Lehninger's Principles of biochemistry", 4th edition, Macmillan worth Publishers.
5. M.Madigan, J.Martinko, J.Parkar, (2009), "Brock Biology of microorganisms", 12th edition, Pearson Education International.
6. Fairbanks and Anderson, (1999), "Genetics", Wadsworth Publishing Company.
7. Prescott, Harley and Klein, "Microbiology", 7 th edition Mc Graw Hill international edition.
8. Robert Weaver, "Molecular biology", 3 rd edition. Mc Graw Hill international edition.
9. Nancy Trun and Janine Trempy, (2004), "Fundamental bacterial genetics", Blackwell Publishing
10. Snustad, Simmons, "Principles of genetics", 3rd edition. John Wiley & sons, Inc.

Reference books:

1. Benjamin Lewin, "Genes IX", Jones and Bartlett publishers.
2. JD Watson, "Molecular biology of the gene", 5 th edition.

Course Code: USc5Mi2

Text books:

1. Jawetz, Melnick and Adelberg's Medical Microbiology, 26th Edition, Lange publication
2. Ananthanarayan and Panicker's, Textbook of Microbiology, 10th edition
3. Ananthanarayan and Panicker's, Textbook of Microbiology, 9th edition
4. Ananthanarayan and Panicker's, Textbook of Microbiology, 8th edition
5. Kuby Immunology, 6th Edition, W H Freeman and Company
6. Pathak & Palan, Immunology: Essential & Fundamental, 1st& 3rd Edition, Capital Publishing Company
7. Fahim Khan, Elements of Immunology, Pearson Education

Reference books / Internet references:

1. Kuby Immunology, 7th edition, W H Freeman and Company
2. Ananthanarayan and Panicker's, Textbook of Microbiology, 8thth edition
3. Baron Samuel , Medical Microbiology, 4th edition
4. <http://www.ncbi.nlm.nih.gov/books/NBK7627/>
5. <http://www.macmillanlearning.com/catalog/static/whf/kuby/>

Course Code: USc5Mi3

Text books:

1. Stanier, R. Y., M. Doudoroff and E. A. Adelberg. General Microbiology, 5th edition, The Macmillan press Ltd
2. Conn, E.E., P. K. Stumpf, G. Bruening and R. Y. Doi. 1987. Outlines of Biochemistry, 5 th edition, 1987. John Wiley & Sons. New York.
3. Gottschalk, G., (1985), Bacterial Metabolism, 2nd edition, Springer Verlag
4. White, D., (1995), The Physiology and Biochemistry of Prokaryotes, 3rd edition, Oxford University Press
5. Nelson, D. L. and M.M. Cox (2005), Lehninger, Principles of biochemistry. 4 th edition, W. H. Freeman and Company
6. Rose, A.H. (1976) Chemical Microbiology, 3rd edition. Butterworth-Heinemann
7. Zubay, G. L (1996), Biochemistry, 4th edition, Wm. C. Brown publishers
8. Mathews, C.K., K.E. van Holde, D.R. Appling, S, J, Anthony-Cahill (2012) Biochemistry, 4th edition. Pearson
9. Wilson and Walker, 4th edition Principles and Techniques of Biochemistry and Molecular Biology. Cambridge University press.

Reference books:

1. Zubay, G. L (1996), Principles of Biochemistry, Wm. C. Brown publishers
2. Cohen, G.N. (2011). Microbial Biochemistry. 2nd edition, Springer

Course Code: USc5Mi4

Text books

1. Casida L. E., "Industrial Microbiology" (2009) Reprint, New Age International (P) Ltd, Publishers, New Delhi.
2. Stanbury P. F., Whitaker A. & Hall S. J., (1997), "Principles of Fermentation Technology", 2nd edition, Aditya Books Pvt. Ltd, New Delhi.
3. Stanbury P. F., Whitaker A. & Hall S. J 3rd edition (2017) "Principles of Fermentation Technology"
4. Pepler, H. J. and Perlman, D. (1979), "Microbial Technology". Vol. 1 & 2, Academic Press
5. H. A. Modi, (2009). 'Fermentation Technology' Vol. 1 & 2, Pointer Publications, India.
6. Okafor Nduka (2007) 'Modern Industrial Microbiology and Biotechnology', Science Publications Enfield, NH, USA.
7. Crueger W. and Crueger A. (2000) "Biotechnology -"A Textbook of Industrial
8. Microbiology", 2nd edition, Panima Publishing Corporation, New Delhi.

9. Prescott and Dunn's 'Industrial Microbiology'(1982) 4th edition, McMillan Publishers

Reference books

1. R. C. Dubey, 2005 A Textbook of 'Biotechnology' S. Chand and Company, New Delhi.
2. H. A. Modi, 2009. 'Fermentation Technology' Vol: 1 & 2, Pointer Publications, India
3. Practical Fermentation Technology by Brian Mcneil & Linda M. Harvey (2008).

T. Y. B. Sc. MICROBIOLOGY THEORY (SEMESTER VI)

Course Code	TOPIC HEADINGS	Credits & Lectures /Semester
USc6Mi1	rDNA Technology, Bioinformatics & Virology	2.5 60 Lectures
Unit I	Recombinant DNA Technology	15
Unit II	Applications of rDNA Technology & Bioinformatics	15
Unit III	Regulation & Basic Virology	15
Unit IV	Advanced Virology	15

USc6Mi2	Medical Microbiology & Immunology: Part - II	2.5 60 Lectures
Unit I	Study of a Few Diseases with Emphasis on Cultural Characteristics of the Etiological Agent, Pathogenesis, Laboratory Diagnosis and Prevention	15
Unit II	Chemotherapy of Infectious Agents	15
Unit III	Immunology - I	15
Unit IV	Immunology - II	15

USc6Mi3	Microbial Biochemistry: Part - II	2.5 60 Lectures
Unit I	Lipid Metabolism & Catabolism of Hydrocarbons	15
Unit II	Metabolism of Proteins and Nucleic Acids	15
Unit III	Metabolic Regulation	15
Unit IV	Prokaryotic Photosynthesis & Inorganic Metabolism	15

USc6Mi4	Bioprocess Technology: Part - II	2.5 60 Lectures
Unit I	Downstream Processing	15
Unit II	Advances in Bioprocess Technology	15
Unit III	Quality Assurance, Quality Control, Instrumentation and Bioassay	15
Unit IV	Industrial Fermentations	15

T.Y.B.SC. MICROBIOLOGY THEORY (SEMESTER V)

rDNA TECHNOLOGY, BIOINFORMATICS & VIROLOGY (USc6Mi1)

LEARNING OBJECTIVES

rDNA technology, Bioinformatics and Virology, USMB 601 is a course for T. Y. B. Sc. in Semester VI Microbiology students which deal with the following:

1. The rDNA technology: This module deals with the basic steps in gene cloning, vectors, model organisms, methods of transformation and screening and identification of recombinant cells.
2. Application of rDNA technology and Bioinformatics: This module will empower the student to understand the basic techniques in Recombinant DNA technology along with their applications. Bioinformatics is the basic tool in understanding Cells at the genomic and proteomic levels. Inclusion of Bioinformatics in this module will empower the learner with *in silico* analytical techniques.
3. Gene Regulation and Basic Virology: This module will make the students understand the genetic basis of regulation and operon control through the involvement of regulatory proteins. The study of Basic Virology will emphasize on the structure, classification and general modes of replication of viruses.
4. Advanced Virology: This module deals with basic structure and life cycle of different viruses and cultivation of viruses. It also comprises of basic study on Prions, Viroid's and viruses causing cancer.

LEARNING OUTCOMES:

- r DNA technology: This module will make the student understand the methods to construct recombinant DNA molecules, also know the tools required like vectors, restriction enzymes etc.
- Application of rDNA technology and Bioinformatics: The learner will know about applications of r DNA technology, through bioinformatics the student will understand the use of databases and software tools for understanding biological data.
- Gene Regulation and Basic Virology: The student will know about gene expression in prokaryotes, operon as a unit of gene regulation, regulation of gene expression in prokaryotes and bacteriophages. The student will also understand about general structure, life cycle and classification of viruses.
- Advanced Virology: The learner will understand the basic structure and life cycle of different viruses and their cultivation. The student will get basic knowledge on Prions, Viroid's and viruses causing cancer.
- Practicals: The students will acquire skill to perform the laboratory techniques and experiments based on the above topics. The students will understand computational biology and *in silico* analytical techniques.

rDNA TECHNOLOGY, BIOINFORMATICS & VIROLOGY

(USc6Mi1): DETAIL SYLLABUS

Title & Content	Lectures / Semester	Notional Periods
Unit I: Recombinant DNA Technology	(Total 15 L)	15
1.1 Branches of Genetics		
1.1.1 Transmission genetics	01L	
1.1.2 Molecular genetics		
1.1.3 Population genetics		
1.1.4 Quantitative genetics		
1.2 Model Organisms		
1.2.1 Characteristics of a model organism	02L	
1.2.2 Examples of model organisms used in study		
1.2.3 Examples of studies undertaken using prokaryotic and eukaryotic model organisms		
1.3 Plasmids		
1.3.1 Physical nature	02L	
1.3.2 Detection and isolation of plasmids		
1.3.3 Plasmid incompatibility and Plasmid curing		
1.3.4 Cell to cell transfer of plasmids		
1.3.5 Types of plasmids		
1.3.6 Resistance Plasmids, Plasmids encoding Toxins and other Virulence characteristics, Col factor, Degradative plasmids		
1.4 Transposable Elements in Prokaryotes		
1.4.1 Insertion sequences		
1.4.2 Transposons: Types, Structure and properties, Mechanism of transposition, Integrons	02L	
1.5 Basic steps in Gene Cloning.		
1.6 Cutting and joining DNA molecules - Restriction and modification systems, restriction endonucleases, DNA ligases	01L	
1.7 Vectors		
1.7.1 Plasmids as cloning vectors. plasmid vectors, pBR322 vector	03L	
1.7.2 Cloning genes into pBR322		
1.7.3 Phage as cloning vectors, cloning genes into phage vector	03L	
1.7.4 Cosmids		
1.7.5 Shuttle vectors		
1.7.6 YAC		
1.7.7 BAC		
1.8 Methods of transformation	01L	

<p>Unit II: Applications of rDNA Technology & Bioinformatics</p> <p>2.1 PCR- Basics of PCR technique and different types of PCR (Reverse transcriptase PCR, Real time quantitative PCR)</p> <p>2.2 Basic techniques 2.2.1 Southern, Northern and Western blotting. 2.2.2 Autoradiography (explain the term)</p> <p>2.3 Screening and selection methods for identification and isolation of recombinant cells</p> <p>2.4 Applications of recombinant DNA technology:- Site specific mutagenesis of DNA, Uses of DNA polymorphism, STRS and VNTRS, DNA molecular testing for human genetic diseases (Only RFLP), DNA typing, gene therapy, Genetic Engineering of plants and animals.</p> <p>2.5 Bioinformatics 2.5.1 Introduction 2.5.2 Definition, aims, tasks and applications of Bioinformatics. 2.5.3 Database, tools and their uses – 2.5.3.1 Importance, Types and classification of databases 2.5.3.2 Nucleic acid sequence databases- EMBL, DDBJ, GenBank, GSDB, Ensembl and specialized Genomic resources. 2.5.3.3 Protein sequence databases-PIR, SWISS-PROT, TrEMBL NRL-3D. Protein structure databases- SCOP, CATH, PROSITE, PRINTS and BLOCKS. KEGG. 2.5.4 Explain the terms:- Transcriptome, Metabolomics, Pharmacogenomics, Phylogenetic analysis, Phylogenetic tree, Annotation, Genomics- structural, functional and comparative genomics, Proteomics - structural and functional proteomics, Sequence alignment - global v/s local alignment, FASTA, BLAST (Different types of BLAST)</p>	<p>(Total 15L)</p> <p>02L</p> <p>02L</p> <p>02L</p> <p>04L</p> <p>05L</p>	<p>15</p>
<p>Unit III: Regulation & Basic Virology</p> <p>3.1 A) Lac operon and problems on Lac operon B) Trp operon</p> <p>3.2 Regulation of lytic and lysogenic pathway of lambda phage</p> <p>3.3 Viral architecture - Capsid, Viral genome and Envelope</p> <p>3.4 Viral classification (Baltimore classification)</p> <p>3.5 Viral replication cycle –</p>	<p>(Total 15 L)</p> <p>06L</p> <p>03L</p> <p>02L</p> <p>01L</p> <p>03L</p>	<p>15</p>

Attachment, Penetration, Uncoating, Types of viral genome, their Replication, Assembly, Maturation & Release.		
<p style="text-align: center;">Unit IV: Advanced Virology</p> <p>4.1 Structure of TMV, T4, Influenza virus.</p> <p>4.2 Life cycle of T4 phage, TMV, Influenza Virus in detail.</p> <p>4.3 Cultivation of viruses- Cell culture techniques, Embryonated egg, Laboratory animals, Cell culture methods: Equipment required for animal cell culture, Isolation of animal tissue.</p> <p>4.4 Visualization and enumeration of virus particles</p> <p>4.4.1 Measurement of infectious units</p> <p>4.4.1.1 Plaque assay</p> <p>4.4.1.2 Fluorescent focus assay</p> <p>4.4.1.3 Infectious center assay</p> <p>4.4.1.4 Transformation assay</p> <p>4.4.1.5 Endpoint dilution assay.</p> <p>4.4.2 Measurement of virus particles and their components</p> <p>4.4.2.1 Electron microscopy</p> <p>4.4.2.2 Atomic force microscopy</p> <p>4.4.2.3 Haemagglutination</p> <p>4.4.2.4 Measurement of viral enzyme activity.</p> <p>4.5 Role of viruses in Cancer: Important definitions, characteristics of cancer cell, Human DNA tumor viruses- EBV, Kaposi sarcoma virus, Hepatitis B and C virus, Papiloma Virus.</p> <p>4.6 Prions: Definition, Examples of diseases caused by prions, Kuru, PrP protein and protein only hypothesis</p> <p>4.7 Viroids</p>	<p style="text-align: center;">(Total 15 L)</p> <p style="text-align: center;">02 L</p> <p style="text-align: center;">03 L</p> <p style="text-align: center;">03 L</p> <p style="text-align: center;">03 L</p> <p style="text-align: center;">03 L</p> <p style="text-align: center;">02 L</p> <p style="text-align: center;">01 L</p> <p style="text-align: center;">01 L</p>	15

MEDICAL MICROBIOLOGY & IMMUNOLOGY: PART - II (USc6Mi2)

LEARNING OBJECTIVES

Medical microbiology encompasses the etiology, transmission, pathogenesis, clinical manifestations, laboratory diagnosis, prophylaxis, and treatment of various diseases that are most common to humans through which the students build on the basic information regarding host defense mechanisms that they have gained in S. Y. B. Sc. an separate unit o chemotherapy that are available for infectious agent and the misuse of antibiotic in generation of multiple resistance strains Immunology is an integral part of Medical Microbiology and this course is designed for T. Y. B. Sc. Microbiology students on the assumption that the students have achieved a basic understanding of Innate Immunity and Host Defense mechanisms. The course has been designed to help understand the ability of our immune system to defend against invading pathogens in a logical fashion. This includes our innate ability to defend against microorganisms (innate immunity); should this first line of defense fail, how we can fight infections (acquired immunity); if we react excessively, what price we pay (hypersensitivity); the role of immunohematology in blood transfusion and very importantly, can we prevent pathogens from infecting us (vaccination).

LEARNING OUTCOMES:

- Give details of the virulence factors and morphological and cultural features of the pathogen
- Correlate these virulence factors with the pathogenesis and clinical features of the disease
- Comment on the mode of transmission, and modes of prophylaxis of these diseases
- Given a few key clinical features, identify the likely causative agent.
- Comment on the methods of diagnosis of the disease.
- Understand the structure and role of T and B cells in generating adaptive immunity and thereby study effector responses in both Humoral & Cell Mediated Immunity Acquire an understanding of the role of immune system in disease:
- Understand the activation of complement system
- Apply the concept of immunity to prevention of disease by development of vaccines

MEDICAL MICROBIOLOGY & IMMUNOLOGY: PART - II
(USc6Mi2): DETAIL SYLLABUS

Title & Content	Lectures / Semester	Notional Periods
Unit I: Study of a Few Diseases with Emphasis on Cultural Characteristics of the Etiological Agent, Pathogenesis, Laboratory Diagnosis and Prevention	15L	15
1.1 Study of vector-borne infections -Malaria	2L	
1.2 Study of sexually transmitted infectious diseases	8L	
1.2.1 Syphilis		
1.2.2 AIDS		
1.2.3 Gonorrhoea		
1.3 Study of central nervous system infectious diseases	5L	
1.3.1.Tetanus		
1.3.2 Polio		
1.3.3.Meningococcalmeningitis		
Unit II: Chemotherapy of Infectious Agents	15L	15
2.1 Attributes of an ideal chemotherapeutic agent - Selective toxicity, Bioavailability of drug, routes of drug administration, LD50, MBC, etc.	2 L	
2.2. Mode of action of antibiotics on-	7 L	
Cell wall (Beta-lactams- Penicillin and Cephalosporins, Carbapenems)		
Cell Membrane (Polymyxin and Imidazole)		
Protein Synthesis (Streptomycin, Tetracycline and Chloramphenicol)		
Nucleic acid (Quinolones, Nalidixic acid, Rifamycin)		
Enzyme inhibitors (Sulfa drugs, Trimethoprim)	1 L	
2.3 List of common antibiotics - used for treating viral, fungal and parasitic diseases.	3 L	
2.4 Mechanisms of drug resistance - Its evolution, pathways and origin for ESBL, VRE, MRSA	2 L	
2.5 Selection and testing of antibiotics for bacterial isolates by Kirby-Bauer method		
(ii) Methods that detect <i>S. aureus</i> resistance to methicillin, and determination of ESBL strains		

Unit IV: Immunology – II	15L	15
<p>4.1 Vaccines</p> <p>4.1.1 Active and passive immunization</p> <p>4.1.2 Types of Vaccine- Killed, attenuated , whole organism, Purified macromolecules as vaccine, recombinant vaccine, DNA vaccine</p> <p>4.1.3 Use of Adjuvants as vaccine</p> <p>4.1.4 New Strategies of vaccine</p> <p>4.1.5 Ideal vaccine</p> <p>4.1.6 Route of vaccine administration, Vaccination schedule</p>	7L	
<p>4.2 Immuno-hematology</p> <p>4.2.1 Human blood group systems, ABO, secretors and non-secretors, Bombay Blood group. Rhesus system and list of other blood group systems</p> <p>4.2.2 Hemolytic disease of new born, Coombs test.</p>		
<p>4.3 Complement System</p> <p>4.3.1 Functions and components of complement</p> <p>4.3.2 Complement Activation—classical, alternative and lectin pathway</p> <p>4.3.3 Biological consequences of complement activation</p>	3L	
<p>4.4 Monoclonal Antibodies</p> <p>4.4.1 Production and clinical uses</p>	2L	

MICROBIAL BIOCHEMISTRY: PART-II (USc6Mi3)

LEARNING OBJECTIVES

Having studied many aspects of microbial physiology in the earlier semester, contents of this semester is designed to understand how myriad organic compounds such as lipids, carbohydrates, proteins and nucleic acids can be utilized by the living cells. These life mechanisms also reveal how biomolecules are synthesized. Since all biosynthetic pathways are denovo or salvage, the vital regulatory role played by enzymes is understood. Various levels and mechanisms of regulation are dealt to make the learner aware of coordinated mechanisms of metabolism in the living cell. Photosynthesis is studied to understand the diversity in mechanism of its electron transfer, pigments and localization of photosynthetic apparatus, although the energy conservation mechanism is not different. Microorganisms are diverse with respect to their metabolism and the field of lithotrophy explains how some universal inorganic compounds can be used to make constituents of cell biomass yet others use them as electron acceptors or reduced compounds as source of energy.

LEARNING OUTCOMES:

At the end of the course in Microbial Biochemistry; USc6Mi3, the learner will have an understanding of the following metabolic process and their significance.

- Metabolism of Lipids, Fatty acids, Nucleotides and Amino acids
- Catabolism of Protein and aliphatic hydrocarbons
- Regulation of metabolic process at various levels
- Photosynthesis
- Metabolism of inorganic molecules with special reference to nitrate and sulfate
- Biological Nitrogen fixation
- Lithotrophy At the end of the course the learner will also acquire the following practical skills
- Screening of microorganisms producing lipase, PHB and protease
- Detection of activity of enzymes which play an important role in amino acid and nitrate metabolism
- Quantitative detection of important metabolic products such as protein and uric acid.
- Quantitative detection of an important metabolic enzymes- protease

Title	Lectures / Semester	Notional Periods
<p align="center">Unit I: Lipid Metabolism & Catabolism of Hydrocarbons</p> <p>1.1 Introduction to Lipids 1.1.1 Lipids –Definition, classification & functions 1.1.2 Types and role of fatty acids found in bacteria 1.1.3 Common phosphoglycerides in bacteria 1.1.4 Action of lipases on triglycerides /tripalmitate</p> <p>1.2 Catabolism of Fatty Acids and PHB 1.2.1 Oxidation of saturated fatty acid by β oxidation pathway 1.2.2 Energetics of β oxidation of Palmitic acid 1.2.3 Oxidation of propionyl CoA by acrylyl- CoA pathway and methylcitrate pathway 1.2.4 PHB as a food reserve and its degradation</p> <p>1.3 Anabolism of Fatty Acids & Lipids 1.3.1 Biosynthesis of straight chain even carbon saturated fatty acid (palmitic acid) 1.3.2 Biosynthesis of phosphoglycerides in bacteria 1.3.3 Biosynthesis of PHB</p> <p>1.4 Catabolism of aliphatic hydrocarbons 1.4.1 Organisms degrading aliphatic hydrocarbons 1.4.2 Hydrocarbon uptake mechanisms 1.4.3 Omega oxidation pathway- 1.4.3.1 Pathway in <i>Corynebacterium</i> and yeast 1.4.3.2 Pathway in <i>Pseudomonas</i></p>	<p align="center">15 L</p> <p align="center">2 L</p> <p align="center">5 L</p> <p align="center">6 L</p> <p align="center">2 L</p>	<p align="center">15</p>
<p align="center">Unit II: Metabolism of Proteins and Nucleic Acids</p> <p>2.1 Protein / amino acid catabolism 2.1.1 Enzymatic degradation of proteins 2.1.2 General reactions of amino acids catalyzed by 2.1.2.1 Amino acid decarboxylases 2.1.2.2 Amino acid deaminases 2.1.2.3 Amino acid transaminases 2.1.2.4 Amino acid racemases 2.1.3 Metabolic fate of amino acids - Glucogenic and ketogenic amino acids 2.1.4 Fermentation of single amino acid - Glutamic acid by <i>Clostridium tetanomorphum</i> 2.1.5 Fermentation of pair of amino acids -Stickland reaction (include enzymes)</p>	<p align="center">15 L</p> <p align="center">6 L</p>	<p align="center">15</p>

<p>2.2 Anabolism of amino acids 2.2.1 Schematic representation of amino acid families 2.2.2 Biosynthesis of amino acids of Serine family (Serine, Glycine and Cysteine)</p>	2 L	
<p>2.3 Catabolism of Nucleotides 2.3.1 Degradation of purine nucleotides up to uric acid formation 2.3.2 Salvage pathway for purine and pyrimidine nucleotides</p>	3 L	
<p>2.4 Biosynthesis of nucleotides 2.4.1 Nomenclature and structure of nucleotides 2.4.2 Role of nucleotides (high energy triphosphates) 2.4.3 Biosynthesis of pyrimidine nucleotides 2.4.4 Biosynthesis of purine nucleotides 2.4.5 Biosynthesis of deoxyribonucleotides</p>	4 L	
Unit III: Metabolic Regulation		
<p>3.1 Definition of terms and major modes of regulation</p>	2 L	15
<p>3.2 Regulation of enzyme activity 3.2.1 Noncovalent enzyme inhibition 3.2.1.1 Allosteric enzymes and feedback inhibition 3.2.1.2 Patterns of FBI, combined activation and inhibition 3.2.2 Covalent modification of enzymes 3.2.2.1 Monocyclic cascades 3.2.2.2 Examples of covalent modification (without structures) 3.2.2.3 Regulation of Glutamine synthetase</p>	5 L	
<p>3.3 DNA binding proteins and regulation of transcription by positive & negative control 3.3.1 DNA binding proteins 3.3.2 Negative control of transcription: Repression and Induction 3.3.3 Positive control of transcription: Maltose catabolism in <i>E. coli</i></p>	4 L	
<p>3.4 Global regulatory mechanisms 3.4.1 Global control & catabolite repression 3.4.2 Stringent response</p>	2 L	
<p>3.5 Regulation of EMP and TCA cycle - (Schematic and Regulation of Pyruvate dehydrogenase Complex)</p>	2 L	
Unit IV: Prokaryotic Photosynthesis & Inorganic Metabolism		
<p>4.1 Photosynthesis 4.1.1 Definition of terms in photosynthesis (light and dark reactions, Hill reaction & reagent, Photophosphorylation) 4.1.2 Photosynthetic pigments 4.1.3 Location of photochemical apparatus 4.1.4 Photochemical generation of reductant</p>	4 L	15

<p>4.2 Light reactions in: 4.2.1 Purple photosynthetic bacteria 4.2.2 Green sulphur bacteria 4.2.3 Cyanobacteria (with details)</p>	<p>3 L</p>	
<p>4.3 Dark reaction 4.3.1 Calvin Benson cycle 4.3.2 Reductive TCA cycle</p>	<p>2 L</p>	
<p>4.4 Inorganic Metabolism 4.4.1 Assimilatory pathways: 4.4.1.1 Assimilation of nitrate, 4.4.1.2 Ammonia fixation – Glutamate dehydrogenase, Glutamine synthetase, GS-GOGAT, Carbamoyl phosphate synthetase 4.4.1.3 Biological nitrogen fixation (Mechanism for N₂ fixation and protection of nitrogenase) 4.4.1.4 Assimilation of sulphate 4.4.2 Dissimilatory pathways: 4.4.2.1 Nitrate as an electron acceptor (Denitrification in <i>Paracoccus denitrificans</i>) 4.4.2.2 Sulphate as an electron acceptor</p>	<p>5 L</p>	
<p>4.5 Lithotrophy–Enlist organisms and products formed during oxidation of Hydrogen, carbon monoxide, Ammonia, Nitrite, Sulphur, Iron.</p>	<p>1 L</p>	

BIOPROCESS TECHNOLOGY: PART-II (USc6Mi4)

LEARNING OBJECTIVES

Bioprocess Technology II is designed to develop the learner's ability to study the techniques use in the downstream process used for the final product and industrial effluent treatment. Bioprocess technology II becomes an important application based paper covering microbial fermentations as well as applying the techniques of molecular biology to enzyme technology, animal tissue culture as well as plant tissue culture. Thus, it becomes a laboratory to market scenario where the entire products reach. The learner is provided with the details of productions of important products like antibiotics, vitamins, organic acid, amino acids and mushrooms along with the analysis techniques using various instruments and bioassays. The learner is expected to learn the need of Quality management and regulatory bodies as the products need to fulfill these requirements. Thus, this paper readies the learner to understand and apply the knowledge of fermentation technology and related products. This course aims to enable graduates to enter industry with an appropriate level of understanding of the need for both the science and business aspects to be achievable to make a viable product and enhance their entrepreneur skills.

LEARNING OUTCOMES:

- Understand the actual process involved in fermentations of important products.
- To apply the knowledge of applications of animal and plant tissue culture techniques.
- Learn the applications of immobilized enzymes in various fields.
- Understand the working of important instruments used in biochemical analysis and bioassay.
- Learn the salient features of quality management and regulatory procedures. At the end of the course the learner will also acquire the following practical skills
- Techniques involved in running a bioassay, immobilization of cells & sterility testing • Preliminary techniques in animal & plant tissue culture.

BIOPROCESS TECHNOLOGY: PART-II (USc6Mi4): DETAIL SYLLABUS

Title	Lectures / Semester	Notional Periods
Unit I: Downstream Processing	15 L	15
1.1 Recovery and purification 1.1.1 Introduction 1.1.2 Methods of DSP: Precipitation, Filtration, Centrifugation, Cell Disruption, Liquid-Liquid Extraction, Solvent Recovery, Chromatography, Membrane Processes, Drying, Crystallization, Whole Broth Processing	10 L	
1.2 Effluent treatment – Introduction, Dissolved oxygen concentration as indicator of water quality, The strength of fermentation effluents, Treatment process (Physical, chemical and biological)	5 L	
Unit II: Advances in Bioprocess Technology	15 L	15
2.1 Animal biotechnology 2.1.1 Primary cell culture and established cell lines 2.1.2 Basic principles 2.1.3 Growth media 2.1.4 Cell viability 2.1.5 Scale up of cultured cells and tissue 2.1.6 Applications of cell culture: Vaccines, somatic cell fusion, valuable products.	5 L	
2.2 Plant tissue culture 2.2.1 Introduction	5 L	
2.2.2 Requirements for in vitro culture, Methods of plant cell and tissue culture 2.2.3 Types of cultures of plant materials: explants, callus, organogenesis, root culture, shoot culture, micropropagation, suspension culture, protoplast culture, protoplast fusion and somatic hybridization. 2.2.4 Applications: production of disease resistant plants, production of virus free plant, In vitro selection of cell lines for disease resistance, micropropagation, secondary metabolites from cell culture, transgenic plants for crop improvement		
2.3 Immobilized enzyme and cells 2.3.1 Introduction and Definitions 2.3.2 Methods 2.3.3 Immobilized Enzyme Reactors 2.3.4 Applications	5 L	

<p align="center">Unit III: Quality Assurance, Quality Control, Instrumentation and Bioassay</p>	<p align="center">15 L</p>	<p align="center">15</p>
<p>3.1 Quality assurance and quality control</p> <p>3.1.1 Definitions, Chemical and pharmaceutical products</p> <p>3.1.2 Variables of batch process</p> <p>3.1.3 Q.A and Q.C wrt.- Raw materials, method of manufacturing, in process items, finished products, label and labeling, packaging materials</p> <p>3.1.4 Control of microbial contamination during manufacturing</p>	<p align="center">4 L</p>	
<p>3.2 Sterilization control and assurance</p>	<p align="center">2 L</p>	
<p>3.3 Instrumentation: Principles, working and application of</p> <p>3.3.1 Spectrophotometry: UV, Visible & IR</p> <p>3.3.2 AAS & AES (Flame photometry)</p>	<p align="center">3 L</p>	
<p>3.4 Bioassay</p> <p>3.4.1 Introduction</p> <p>3.4.2 Types: Diffusion, End Point, Turbidometric, Metabolic Response, Enzymatic</p>	<p align="center">3 L</p>	
<p>3.5 Intellectual property rights</p> <p>3.5.1 Genesis, Role of WTO and TRIPS</p> <p>3.5.2 Overview of patent system</p> <p>3.5.3 Requirements for patentability</p> <p>3.5.4 Patent Categories</p> <p>3.5.5 Preliminary steps for patent applications</p> <p>3.5.6 Patent Procedures</p> <p>3.5.7 For biotech and microbiological products</p>	<p align="center">3 L</p>	
<p align="center">Unit IV: Industrial Fermentations</p>	<p align="center">15 L</p>	<p align="center">15</p>
<p>4.1 Penicillin and semisynthetic penicillins: Introduction, biosynthesis and regulation, strain development, production methods. Semisynthetic penicillins: Examples, production, advantages</p>	<p align="center">3 L</p>	
<p>4.2 Aminoglycoside: Streptomycin: Aminoglycoside antibiotics, biosynthesis, regulation of biosynthesis, strain development, production method, recovery.</p>	<p align="center">3 L</p>	
<p>4.3 Vitamin B₁₂: Occurrence and economic significance, structure, biosynthesis, production based on media containing carbohydrates by-<i>Propionibacteria</i> and <i>Pseudomonas</i>, recovery.</p>	<p align="center">2 L</p>	
<p>4.4 Citric acid: Introduction, strains used for production, biosynthesis, nutrient media, production processes- surface and submerged, product recovery.</p>	<p align="center">3 L</p>	
<p>4.5 Glutamic acid: Production strains, biosynthesis, effect of permeability on production, conditions of manufacturing, production process and recovery.</p>	<p align="center">2 L</p>	
<p>4.6 Mushroom cultivation (Agaricus): Edible mushroom species, preparation of substrate- composting- phase I and phase II, Factors affecting composting, preparation of spawn, casing, induction of fruiting body formation, harvesting</p>	<p align="center">2 L</p>	

T. Y. B. Sc. MICROBIOLOGY PRACTICALS (SEMESTER-VI)

Course Code: USc6Mi1 [Practicals Based on USc6Mi1, Credits -1.5, Lectures- 60,

Notional Periods-15]

1. Isolation of genomic DNA of E. coli and measurement of its concentration by UV-VIS.
2. Enrichment of coliphages, phage assay (pilot & proper).
3. Restriction digestion of lambda phage /any plasmid DNA (Demo)
4. Beta galactosidase assay
5. Bioinformatics Practicals On Line Practical
 - i. Visiting NCBI and EMBL websites & list services available, software tools available and databases maintained
 - ii. Visiting & exploring various databases mentioned in syllabus and
 - a. Using BLAST and FASTA for sequence analysis
 - b. Fish out homologs for given specific sequences (by teacher – decide sequence of some relevance to their syllabus and related to some biological problem e.g. evolution of a specific protein in bacteria, predicting function of unknown protein from a new organism based on its homology)
 - c. Six frame translation of given nucleotide sequence
 - d. Restriction analysis of given nucleotide sequence
 - e. Pair-wise alignment and multiple alignment of a given protein sequences
 - f. Formation of phylogenetic tree
6. Animal cell culture (Demo)

Course Code: USc6Mi2 [Practicals Based on USc6Mi2, Credits -1.5, Lectures-60,

Notional Periods-15]

1. Demonstration of malarial parasite in blood films (Demo)
2. Selection and testing of antibiotics using the Kirby-Bauer method
3. Determination of MBC of an antibiotic.
4. Blood grouping – Direct & Reverse typing
5. Coomb's Direct test
6. Determination of Isoagglutinin titer
7. Demonstration experiments - Widal, VDRL

**Course Code: USc6Mi3 [Practicals Based on USc6Mi3; Credits-1.5, Lectures- 60,
Notional Periods-15]**

1. Detection of PHB producing bacteria
2. To study catabolite repression by diauxic growth curve.
3. Protein estimation by Lowry's method
4. Estimation of uric acid
5. Qualitative and Quantitative assay of Protease
6. Qualitative detection of Lipase
7. Study of breakdown of amino acids – Lysine decarboxylase and Deaminase activity
8. Study of Lithotrophs – Nitrosification and Nitrification

**Course Code: USc6Mi4 [Practicals Based on USc6Mi4, Credits -1.5, Lectures- 60,
Notional Periods-15]**

1. Bioassay of an antibiotic (Ampicillin / Penicillin)
2. Bioassay of Cyanocobalamin.
3. Perform immobilization of yeast cells for invertase activity - making of beads, Determination of activity and count by haemocytometer and viable count.
4. Plant tissue culture – Callus culture (Demo).
5. Sterility testing of injectable.
6. Chemical estimation of Penicillin
7. Estimation of phenol.
8. Industrial Visit

TEXT BOOKS AND REFERENCE BOOKS (SEMESTER VI)

Course Code: USc6Mi1

Text books:

1. Peter J. Russell (2006), "I Genetics-A molecular approach", 2nd edition.
2. Benjamin A. Pierce (2008), "Genetics a conceptual approach", 3rd edition, W. H. Freeman and company.
3. R. H. Tamarin, (2004), "Principles of genetics", Tata McGraw Hill.
4. M.Madigan, J.Martinko, J.Parkar, (2009), "Brock Biology of microorganisms", 12th edition, Pearson Education International.
5. Fairbanks and Anderson, (1999), "Genetics", Wadsworth Publishing Company.
6. Prescott, Harley and Klein, "Microbiology",. 7th edition Mc Graw Hill international

edition.

7. Edward Wagner and Martinez Hewlett, (2005) "Basic Virology", 2nd edition, Blackwell Publishing

8. Teri Shors,(2009), "Understanding viruses", Jones and Bartlett publishers.

9. S.Ignacimuthu, (2005), "Basic Bioinformatics", Narosa publishing house.

10. Robert Weaver, (2008), "Molecular biology", 3rd edition, Mc Graw Hill international edition.

11. Primrose and Twyman, (2001), "Principles of gene manipulation and genomics", 6th edition, Blackwell Publishing

12. Arthur Lesk, (2009), "Introduction to Bioinformatics", 3rd Edition, Oxford University Press

13. Snustad, Simmons, "Principles of genetics", 3rd edition. John Wiley & sons, Inc.

14. A textbook of biotechnology R.C.Dubey 4 th edition. S.Chand.

Reference books:

1. Flint, Enquist, Racanillo and Skalka, "Principles of virology", 2nd edition. ASM press.

2. T. K. Attwood & D. J. Parry-Smith, (2003), "Introduction to bioinformatics", Pearson education

3. Benjamin Lewin, (9 th edition), "Genes IX", Jones and Bartlett publishers.

4. JD Watson, "Molecular biology of the gene", 5th edition.

Course Code: USc6Mi2

Text books:

1. Jawetz, Melnick and Adelberg's Medical Microbiology, 26th Edition, Lange publication

2. Ananthanarayan and Panicker's, Textbook of Microbiology, 10th edition 2017

3. Ananthanarayan and Panicker's, Textbook of Microbiology, 9th edition

4. Ananthanarayan and Panicker's, Textbook of Microbiology, 8th edition

5. Introduction to diagnostic microbiology for lab Science Maria Dannessa Delost 2015

6. Prescott's microbiology 10th edition 2017

7. Kuby Immunology,4th and 6th edition, W H Freeman and Company

8. Pathak & Palan, Immunology: Essential & Fundamental, 1st& 3rd edition, Capital Publishing Company

9. Fahim Khan, Elements of Immunology, Pearson Education

Reference books / Internet references:

1. Baron Samuel , Medical Microbiology, 4th edition

<http://www.ncbi.nlm.nih.gov/books/NBK7627/>

2. Kuby Immunology, 7th Edition, W H Freeman and Company

<http://www.macmillanlearning.com/catalog/static/whf/kuby/>

Course Code: USc6Mi3

Text books:

1. Stanier, R. Y., M. Doudoroff and E. A. Adelberg. General Microbiology, 5th edition, The Macmillan press Ltd.
2. Conn, E.E., P. K. Stumpf, G. Bruening and R. Y. Doi. 1987. Outlines of Biochemistry, 5 th edition, 1987. John Wiley & Sons. New York.
3. Gottschalk, G., (1985), Bacterial Metabolism, 2nd edition, Springer Verlag
4. White, D., (1995), The Physiology and Biochemistry of Prokaryotes, 3rd edition, Oxford University Press
5. Nelson, D. L. and M.M. Cox (2005), Lehninger, Principles of biochemistry, 4th edition, W. H. Freeman and Company.
6. G. Moat, J.W. Foster, M,P. Spector.(2002), Microbial Physiology, 4th edition, WILEYLISS
7. Madigan, M.T. and J.M. Martinko2006. [11th edition] Brock Biology of Microorganisms. Pearson Prentice Hall.

Reference books:

1. Zubay, G. L (1996), Biochemistry, 4th edition, Wm. C. Brown publishers
2. Zubay, G. L (1996), Principles of Biochemistry, Wm. C. Brown publishers
3. Principles of Biochemistry, Lehninger, 5th edition, W. H. Freeman and Company

Course Code: USc6Mi4

Text books

1. Casida L. E., "Industrial Microbiology" (2009) Reprint, New Age International (P) Ltd, Publishers, New Delhi.
2. Stanbury P. F., Whitaker A. & Hall S. J., (1997), "Principles of Fermentation Technology", 2nd Edition, Aditya Books Pvt. Ltd, New Delhi.
3. Stanbury P. F., Whitaker A. & Hall S. J 3rd Edition (2017) "Principles of Fermentation Technology"
4. H. K. Das., "Text book of Biotechnology", 2nd and 3rd edition.
5. A textbook of biotechnology R.C.Dubey 4 th edition. S.Chand.

6. H. A. Modi, (2009). ‘‘Fermentation Technology’’ Vol. 1 & 2, Pointer Publications, India
7. Okafor Nduka (2007) ‘‘Modern Industrial Microbiology and Biotechnology’’, Science Publications Enfield, NH, USA.
8. Crueger W. and Crueger A. (2000) "Biotechnology -"A Textbook of Industrial
9. Microbiology", 2nd Edition, Panima Publishing Corporation, New Delhi.
10. Prescott and Dunn's ‘‘Industrial Microbiology’’(1982) 4th Edition, McMillan Publishers.
11. Veerakumari L. ‘‘Bioinstrumentation’’, MJP Publisher
12. Pharmaceutical Microbiology, Hugo and Russell, 7 th edition, Blackwell Science.

Reference books

1. Pepler, H. J. and Perlman, D. (1979), "Microbial Technology''. Vol 1 & 2, Academic Press.
2. Williams, Bryan L; Wilson, 2nd edition.” A Biologist's guide to principles and techniques of practical biochemistry” Baltimore: University Park Press, 1981.
3. Wilson, Keith, 1936-; Goulding, Kenneth H, 3rd edition., A Biologist's guide to principles and techniques of practical biochemistry” London ; Baltimore : E. Arnold, 1986.
4. Wilson and Walker, ‘‘Principles and techniques of practical biochemistry’’ 5th edition

Theory Examination Pattern

Choice Based Credit System (CBCS)

Revised Scheme of Examination

The performance of the learners shall be evaluated into two components. The learner's Performance shall be assessed by Internal Assessment with 40% marks in the first component by conducting the Semester End Examinations with 60% marks in the second component. The allocation of marks for the Internal Assessment and Semester End Examinations are as shown below:-

A) Internal Assessment: 40 %

40 Marks

Sr. No.	Particular	Marks
01	One periodical class test / online examination to be conducted in the given semester	20 Marks
02	Any two tools out of these (10 Marks each) 1. Group/ Individual Project 2. Presentation and write up on the selected topics of the subjects / Case studies. 3. Test on Practical Skills 4. Open Book Test 5. Quiz	20 Marks

Question Paper Pattern

(Periodical Class Test/ online examination for the Courses at Under Graduate Programmes)

- ❖ Maximum Marks: 20
- ❖ Duration: 30 Minutes

Particular	Marks
Match the Column / Fill in the Blanks / Multiple Choice Questions/ True/False/Answer in One or Two Lines (Concept based Questions) (1 Marks each)	20 Marks

B) Semester End Examination: 60 %

60 Marks

- Undergraduate Programmes of T. Y. B. Sc. (Sem. V & VI)

Duration: The examination shall be of 2 hours duration.

Question Paper Pattern

Theory question paper pattern

1. There shall be four questions of 15 Marks each (30 marks with internal options).
2. On each unit there will be one question and fourth question will be based on entire syllabus.
3. All questions shall be compulsory with internal options.
4. Question may be subdivided into sub-questions a, b, c... and the allocation of marks depends on the weightage of the unit.

Passing Standard

The learners to pass a course shall have to obtain a minimum of 40% marks in aggregate for each course where the course consists of Internal Assessment and Semester End Examination. The learners shall obtain minimum of 40% marks (i.e. 16 out of 40) in the Internal Assessment and 40% marks in Semester End Examination (i.e. 24 Out of 60) separately, to pass the course and minimum of Grade D, wherever applicable, to pass a particular semester. A learner will be said to have passed the course if the learner passes the Internal Assessment and Semester End Examination together.

PRACTICAL EXAMINATION PATTERN

Sr. No.	Particulars	Marks	Total
1.	Laboratory work (Paper I, II, III, IV)	35 + 35 + 35 + 35 =	140
2.	Journal	05 + 05+ 05 + 05 =	20
3.	Viva	05 + 05+ 05 + 05 =	20
4.	Assignment/Visit report/Case study/SOP writing/Quiz	05 + 05+ 05 + 05 =	20

PRACTICAL BOOK/JOURNAL

Semester V

The learners are required to present a duly certified journal for appearing at the practical examination, failing which they will not be allowed to appear for the examination.

In case of loss of Journal and/ or Report, a Lost Certificate should be obtained from Head/ Co-Ordinator / Incharge of the department; failing which the learner will not be allowed to appear for the practical examination.

Semester VI

The learners are required to present a duly certified journal for appearing at the practical examination, failing which they will not be allowed to appear for the examination.

In case of loss of Journal and/ or Report, a Lost Certificate should be obtained from Head/ Co-ordinator / Incharge of the department; failing which the learner will not be allowed to appear for the practical examination.



Department of Biotechnology
C.K. Thakur Arts, Commerce and Science College (Autonomous), New Panvel



Janardan Bhagat Shikshan Prasarak Sanstha's



**CHANGU KANA THAKUR
ARTS, COMMERCE & SCIENCE COLLEGE, NEW PANVEL
(AUTONOMOUS)**

Re-accredited 'A+' Grade by NAAC
'College with Potential for Excellence' Status Awarded by UGC
'Best College Award' by University of Mumbai

**Affiliated to University of Mumbai with an autonomous
Status**

**Revised Syllabus of
Program: T.Y. B.Sc. Biotechnology
(Semester V & VI)
Choice Based Credit & Grading System (60:40)**

(To be implemented from Academic Year 2021-2022)



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T.Y. B.Sc. Biotechnology Course Structure
(Semester V)

Course code	Title	Theory/ Practical	Marks	Credits	No. of Lectures & Practical
UBT5CBI	Cell biology	Theory	100	2.5	60
UBT5MMI	Medical Microbiology & Instrumentation	Theory	100	2.5	60
UBT5GMB	Genomes and Molecular Biology	Theory	100	2.5	60
UBT5MBI	Marine Biotechnology	Theory	100	2.5	60
UBT5PR1	Cell biology+ Medical Microbiology & Instrumentation	Practical	100	3.0	72
UBT5PR2	Genomes and Molecular Biology+ Marine Biotechnology	Practical	100	3.0	72
UBT5BIS	Applied Component: Biosafety	Theory	100	2.0	48
UBT5PR3	Applied Component: Biosafety	Practical	100	2.0	48
		TOTAL	800	20	480

(Semester VI)

Course code	Title	Theory/ Practical	Marks	Credits	No. of Lectures & Practical
UBT6BIC	Biochemistry	Theory	100	2.5	60
UBT6IMI	Industrial Microbiology	Theory	100	2.5	60
UBT6PNE	Pharmacology and Neurochemistry	Theory	100	2.5	60
UBT6ENB	Environmental Biotechnology	Theory	100	2.5	60
UBT6PR1	Biochemistry + Industrial Microbiology	Practical	100	3.0	72
UBT6PR2	Pharmacology - Neurochemistry and Environmental Biotechnology (50M)+ Project work (50M)	Practical	100	3.0	72
UBT6ABT	Applied Component: Agribiotechnology	Theory	100	2.0	48
UBT6PR3	Applied Component: Agribiotechnology	Practical	100	2.0	48
		TOTAL	800	20	480



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Preamble:

Biotechnology is one of the youngest branches of Life Science, which has expanded and established as an advanced interdisciplinary applied science in the last few years. Biotechnology at the core envisages the comprehensive study of Life and the Interdisciplinary potential of Biotechnology has led to a unique status for Biotechnology in Research and Industry.

Biotechnology has its applications in almost every field touching practically every human activity. The applied aspect of Biotechnology is now getting established with its applications in Industry, Agriculture, Health and Environment, Biotechnology is the leading science expanding exponentially.

Biotechnology demands a trained, skilled human resource to establish the Industry and Research sectors. The field is novel and still expanding which demands inputs in Infrastructure and Technology. The need of the hour is to design appropriate syllabi which keeps pace with changing times and technology with emphasis on applications while elucidating technology in depth. The syllabi till today had been sufficient to cater to the needs of students for building up their careers in industry and research. However, with the changing scenario at local and global level, we feel that the syllabus orientation should be altered to keep pace with developments in the education and industrial sector. Theory supplemented with extensive practical skill sets will help a graduate student to avail the opportunities in the applied fields (research, industry or institutions), without any additional training. Thus, the college itself will be developing trained and skilled man-power.

Biotechnology being an interdisciplinary subject, this restructured syllabus will combine the principles of physical, chemical, and biological sciences along with developing advanced technology. Biotechnology curricula are operated at two levels viz. undergraduate and postgraduate. The undergraduate curricula are prepared to impart primarily basic knowledge of the respective subject from all possible angles while postgraduate syllabus emphasizes on more applied courses. In addition, students are to be trained to apply this knowledge particularly in day-to-day applications of biotechnology and to get a glimpse of research.

The current syllabus includes all basic concepts of biological sciences. Students will also be introduced with emerging fields in Biotechnology like Marine biotechnology, Environmental biotechnology, Pharmacology, Agribiotechnology etc. Project component has been introduced in the curriculum to provide good quality self-learning. It is hoped that the revised syllabus shall serve its objective of promoting outcome-based learning to meet the changing needs of the biotechnology sector.



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Teaching pattern: One (01) Credit would be of thirty- forty (30-40) learning hours; of this more than fifty percent of the time will be spent on classroom instructions including practical as prescribed by the University. Rest of the time spent invested for assignments, projects, journal writing, case studies, library work, industrial visits, attending seminars/workshops, preparations for examinations etc. would be considered as notional hours. The present syllabus considers (60L as classroom teaching and 15 lectures as Notional hours/ paper). Each lecture duration would be for 48 min. The names of the reference books provided in the syllabus are for guidance purposes only. Students and faculty are encouraged to explore additional reference books, online lectures, videos, science journals for latest/ additional information.

Examination pattern: The performance of the learners shall be evaluated into two components. The learner's Performance shall be assessed by Internal Assessment with 40% marks in the first component by conducting the Semester End Examinations with 60% marks in the second component.

Theory:

The question paper for the Term End Exam would be of 60 marks consisting of 4 Questions (15M each), of which one question from each unit in the syllabus. Questions may be subdivided into sub-questions a, b, c... and the allocation of marks depends on the weightage of the unit.

The question paper would be set for 120 marks including internal options.

Practical:

- Would be conducted over a period of 3 days; 50M each paper.
- Each student to perform 2 major and 2 minor practical for Semester V and 2 major and project presentation for Semester VI
- Viva would be conducted during the practical during Semester V; Semester VI would have ONLY project presentation
- Distribution of marks for the experiments carried out during the examination:
- Semester V (50M/ paper): Major: 20M; Minor: 10M; Viva: 10M; Journal 10M.
- Semester VI (50M/paper): Major (x2): 40M; Journal: 10M; Project 50M
- The report could be around 25-30 pages with appropriate referencing and formatting. Marks distribution for the project would be as follows: 25M documentation, 15M presentation, 10 M viva and interactions;
- Students would undertake a project for 1-2 months during the last semester for 50 M. The project should include either of the following:
One/ more major instrumentation OR
One / more major technique/s required in the field of interest OR
Bioinformatics OR Biostatistics.



Programme Specific Outcomes
B.Sc. Biotechnology degree programme

- PS01 Students will learn the basic concepts of Chemistry and analytical chemistry applied in Biological Sciences.
- PS02 An education in Cell biology, Biochemistry, Animal and plant physiology, human genetics and Immunology will impart knowledge to the students about cellular structure, biomolecules, metabolic pathways, its regulation along with defense mechanisms and physiological processes in plants and animals.
- PS03 Students will also learn the concepts of biodiversity, ecology, environment and its conservation.
- PS04 Students will gain basic information of microbial cultures, sterilization methods and enzyme production. They will be taught biosafety guidelines and good laboratory practices.
- PS05 Introduction of recent topics like Drug delivery, Marine biotechnology, Bioinformatics will impart knowledge of mechanism of drug delivery, drug designing and applications of marine organisms as food, nutraceutical and cosmetics etc.
- PS06 Students will understand the principles and the applications of molecular biology and genetic engineering methods with an emphasis on the application of recombinant DNA technology to animals, plants and microbial organisms.
- PS07 The course will give the knowledge of Bioethics, IPR, entrepreneurship, scientific writing, Communication, and management skills to the students.
- PS08 Students will get hands-on training of techniques used in Cell Biology, Biochemistry, Microbiology, Immunology, Molecular Biology and Genetic Engineering.



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SEMESTER V		
Course Code	Title	Credits
UBT5CBI	Paper-I (Cell Biology)	2.5
Course Objectives	<p>CO1-Students will get knowledge of different types of extracellular signals and receptors, and explain their functional significance.</p> <p>CO2-Students will get knowledge of developmental biology which includes stages, mechanisms and patterns of embryonic development.</p> <p>CO3-Students will get knowledge of plant developmental biology and stem cell biology.</p> <p>CO4-The students will be able to learn how genetics contributes to predisposition and progression of cancer. It will help the students to understand how immunotherapy is, and can be, used to treat human illness.</p>	
Learning Outcomes	<p>By the end of the course the student will be able to:</p> <ul style="list-style-type: none"> • Understand the molecules involved in cell signaling. • Gain an understanding of the basic concepts of events during embryonic development and stem cell biology. • Gain insight into the biology of cancer cells. 	
UNIT	Topics	Lectures
Unit-I Cell Signalling	<p>Cell signaling and signal transduction: Introduction General Principles of Cell Signalling.</p> <p>Signaling via G-Protein-linked Cell-Surface Receptors Signaling via Enzyme-linked Cell-Surface Receptors Target-Cell Adaptation.</p> <p>The Logic of Intracellular -Signaling: Lessons from Computer-based "Neural Networks.</p>	15
Unit-II Developmental Biology	<p>Overview of how the modern era of developmental biology emerged through multidisciplinary approaches.</p> <p>Stages of development- zygote, blastula, gastrula, neurula cell fate & commitment – potency- concept of embryonic stem cells, differential gene expression, terminal differentiation, lineages of three germ layers, fate map.</p> <p>Mechanisms of differentiation- cytoplasmic determinants, embryonic induction, concept of morphogen, mosaic and regulative development Pattern formation- axis specification, positional identification (regional specification), Morphogenetic movements.</p> <p>Model organisms in Developmental biology: Hydra, Zebra fish, <i>C. elegans</i> etc.</p>	15



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Unit-III Plant Developmental Biology & Stem cell Biology	<p>Overview of Plant Development: Embryogenesis and early pattern formation in plants; Plant Meristem Organization and Differentiation- Organization of Shoot Apical Meristem (SAM); Organization of Root Apical Meristem (RAM); Phloem differentiation.</p> <p>Model organisms and experimental tools in cell and developmental plant biology: <i>Arabidopsis thaliana</i>.</p> <p>Definition, classification and source of stem cells; Stem cells and therapeutic cloning.</p>	15
Unit-IV Cancer Biology	<p>Cancer: Introduction, Characteristics of normal cell and cancerous cell, Tumor- Benign and malignant.</p> <p>Types of cancer</p> <p>Cancer as a Micro-evolutionary Process - invasion metastasis, angiogenesis.</p> <p>Oncogenes and tumor suppressor genes; The Molecular Genetics of Cancer.</p> <p>Cancer and Virus, Cancer diagnosis and treatment, Preventive measures for cancer.</p>	15
References		
<ol style="list-style-type: none"> 1. Molecular Cell Biology. 7th Edition, (2012) Lodish H., Berk A, Kaiser C., K Reiger M., Bretscher A., Ploegh H., Angelika Amon A., Matthew P. Scott M., W.H. Freeman and Co., USA . 2. Molecular Biology of the Cell, 5th Edition (2007) Bruce Albert's, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter. Garland Science, USA. 3. Cell Biology, 6th edition, (2010) Gerald Karp. John Wiley & Sons., USA. 4. The Cell: A Molecular Approach, 6th edition (2013), Geoffrey M. Cooper, Robert E. Hausman, Sinauer Associates, Inc. USA. 5. Developmental Biology; Scott Gilbert; 9th Edition. 		



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SEMESTER V		
Course Code	Title	Credits
UBT5MMI	Paper-II (Medical Microbiology & Instrumentation)	2.5
Course Objectives	<p>CO1- The students will get knowledge of viral replication strategies; and compare and contrast replication mechanisms used by viruses relevant for human disease.</p> <p>CO2-Students will learn the mechanism of action of chemotherapeutic drugs and resistance.</p> <p>CO3-Students will learn basic principles and applications of spectroscopy.</p> <p>CO4-Students will learn about new emerging diseases and new vaccine strategies.</p>	
Learning Outcomes	<p>By the end of the course the student will be able to:</p> <ul style="list-style-type: none"> • Identify various common and new emerging diseases of human, different diagnostic techniques and various methods involved in infection control. • Compare different separation techniques & use them in research work. 	
UNIT	Topics	Lectures
Unit-I Virology	<p>Introduction to viruses-Position in biological spectrum; Virus properties.</p> <p>General structure of viruses, Baltimore Classification and Taxonomy(ICTV);</p> <p>Cultivation of viruses, Reproduction of ds DNA phages: One step growth experiment, Temperate phages and lysogeny - lambda phage, Regulation of phage gene expression.</p> <p>Hepatitis /ssRNA (influenza), animal viruses and plant (TMV)virus;</p> <p>Virus purification and assays; Cytocidal infections and cell damage ,Viroids and Prions;</p>	15
Unit-II Chemotherapeutic drugs	<p>Discovery and Design of antimicrobial agents,</p> <p>Classification of Antibacterial agents, Selective toxicity, MIC, MLC;</p> <p>Mode of action for:</p> <ul style="list-style-type: none"> • Beta lactam antibiotics: Penicillin, Cephalosporins • Glycopeptides: Vancomycin • Polypeptides: Bacitracin • Injury to Plasma membrane: Polymyxin • Inhibition of protein synthesis Aminoglycosides, Tetracycline, Chloramphenicol, Macrolides and Erythromycin 	15



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	<ul style="list-style-type: none"> • Inhibition of Nucleic acid synthesis: Quinolones, Rifampicin, Metronidazole • Antimetabolites: Sulphonamides, Trimethoprim, 2-deoxy D Glucose. • Antifungal drugs, Antiviral drugs Amantadine, Acyclovir, Remdesivir. <p>Drug Resistance: Mechanism, Origin and transmission of drug resistance; Use and misuse of antimicrobial agents.</p>	
Unit-III Common and New Emerging diseases	<p>Introduction to new emerging diseases and causative agents like MERS, SARS, Swine flu, COVID-19, Nipah virus, Ebola virus.</p> <p>Diagnosis, Treatment and preventive measures for MERS, SARS, COVID-19, Nipah virus, Ebola virus.</p> <p>Malaria and Dengue Virus.</p> <p>Vaccines: Subunit Vaccines -HSV, Peptide Vaccines, Attenuated Vaccines-Cholera, Vector Vaccines-Vaccinia virus, Genetic Immunization.</p>	15
Unit-IV Bio analytical techniques	<p>Basic Principles of spectroscopy: Principle, instrumentation and applications of IR, NMR, atomic absorption and Mass spectroscopy, fluorimetry, ORD and CD.</p> <p>Isotopes in Biology: Detection Techniques of Radioactivity: GM counter, Scintillation counter, Autoradiography, Applications of Tracer techniques in Biology.</p>	15
References		
<ol style="list-style-type: none"> 1. Principles and techniques in biochemistry and molecular biology (2010), Keith Wilson and John Walker, 7th edition, Cambridge University Press. 2. Biophysics (2002) Vasantha Pattabhi and N. Gautham, Kluwer Academic Publishers. 3. Physical Biochemistry: principles and applications, 2nd edition (2009), David Sheehan, John Wiley & Sons Ltd. 4. Mim's Medical Microbiology 5th edition. 5. Microbiology by Prescott Harley and Klein 5th edition Mc Graw Hill. 6. Medical Microbiology Jawetz, E., Brooks, G.E, Melnick, J.L., Butel, J.S Adelberg E. A 18th edition. Medical Microbiology by Patrick Murray 5th edition. 7. Foundations in Microbiology by Talaro and Talaro Third edition W.C Brown 8. Understanding Viruses by Teri Shors. 		



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SEMESTER V		
Course Code	Title	Credits
UBT5GMB	Paper-III (Genomes and Molecular Biology)	2.5
Course Outcomes	<p>CO1- Students will learn different techniques of gene transfer in plants to develop transgenic plants.</p> <p>CO2- Students will learn different techniques of gene transfer in animals to develop transgenic Animals.</p> <p>CO3- Students will be able to Understand the range of molecular laboratory techniques used routinely in human forensic analysis and population genetic analysis including sex typing, DNA profiling, Single Nucleotide Polymorphism (SNP) detection and DNA sequencing.</p> <p>CO4- The students will have knowledge of tools like gene sequencing and editing.</p>	
Learning Outcomes	<p>By the end of the course the student will be able to:</p> <ul style="list-style-type: none"> • Understand the basis of gene cloning and development of transgenic animals and plants • Gain knowledge regarding recent developments in genome sequencing and editing. 	
UNIT	Topics	Lectures
Unit-I Genetic Engineering of Plants	<p>Gene transfer methods in plants: Plant transformation with the Ti plasmid of <i>A. tumefaciens</i>, Ti plasmid derived vector system.</p> <p>Physical and Chemical methods of transferring genes to plants: electroporation, micro-projectile bombardment, liposome mediated, protoplast fusion, PEG and calcium phosphate mediated gene transfer.</p> <p>Viral Vectors for plant cells transformation brief introduction.</p> <p>GM Crops: GM Papaya, BT Cotton, BT Brinjal, Golden Rice, Improvement of seed quality proteins. Pros. and Cons. of GM crops.</p>	15
Unit-II Genetic Engineering of Animals	<p>Gene transfer methods in Animals: Transgenic mice-methodology-retroviral method, DNA microinjection, ES method, genetic manipulation with cre-loxP. Brief introduction of vectors for animal cells.</p> <p>Transgenic animal recombination system.</p> <p>Cloning live stock by nuclear transfer.</p> <p>Applications of Transgenic animals: Animal models, use of transgenic animals in therapeutic, agriculture and food.</p>	15



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Unit-III Tools in Molecular Biology	<p>Construction of genomic DNA libraries, cDNA libraries and chromosomal libraries.</p> <p>Recombinant selection and screening methods: genetic, immunochemical, Southern and Western analysis, nucleic acid hybridization, HART, HRT.</p> <p>Expression of cloned DNA molecules and maximization of expression.</p> <p>Locating genes on chromosomes: Chromosome walking and jumping.</p> <p>Maxam-Gilbert's method, Sanger's dideoxy method, Automated DNA sequencing, Pyro-sequencing.</p>	15
Unit-IV Prokaryotic gene regulation and Gene editing	<p>Prokaryotic gene regulation: Lactose and Tryptophan operons- Gene organization and regulation.</p> <p>Human genome mapping and its implications in health and disease; RNAi, ZNF(Zinc finger nucleases), TALENS (Transcription Activator Like Effector Nucleases), CRISPER/Cas system(Clustered Regularly Interspersed Repeats)</p>	15
References		
<ol style="list-style-type: none">1. iGenetics A Molecular Approach 3rd Edition Peter J. Russell.2. Molecular Biotechnology-Principles and Applications of Recombinant DNA Technology 4th Edition Glick B.R., Pasternak J.J., Patten C.L.3. Principles of Gene Manipulation 7th Edition Primrose S.B., Twyman R.M.4. Biotechnology 3rd Edition S.S. Purohit.5. Genomes 3rd Edition T.A. Brown.6. Biotechnology B.D. Singh.7. Gene Cloning and DNA Analysis 6th Edition T.A. Brown.8. Genomics Cantor C.R., and Smith C.L. John Wiley & Sons. (1999)		



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SEMESTER V		
Course Code	Title	Credits
UBT5MBI	Paper-IV (Marine Biotechnology)	2.5
Course Objectives	<p>CO1 Students will learn methodological approaches that are currently being used for microbial bio-prospecting, with emphasis in the marine environment.</p> <p>CO2 Students will get knowledge of various functional food ingredients and nutraceuticals obtained from marine sources.</p> <p>CO3 Students will get knowledge of different applications of marine biotechnology.</p> <p>CO4 Students will learn basic technical aspects of marine food technology.</p> <p>CO5 Students will get knowledge of aqua farming and their and techniques like aquaponics and fish feed technology.</p>	
Learning Outcomes	<p>By the end of the course the student will be able to:</p> <ul style="list-style-type: none"> • Learn methodological approaches used for microbial prospecting. • Understand marine organism and their application • Marine food products preparation and preservation methods • Learn importance of aquaculture technique, fish feed technology. 	
UNIT	Topics	Lectures
Unit-I Introduction to Marine Biotechnology	<p>Seawater composition and its properties.</p> <p>Classification of the marine environment. Characteristics of marine microorganisms.</p> <p>Specialized microorganisms: Extremophiles: barophiles, thermophiles, psychrophiles, halophiles actinomycetes, polyextremophiles and anaerobes. Marine viruses and Giruses, Giant bacteria, Marine algae and plants (seaweeds, sea grasses, mangrove plants).</p> <p>Microbial Bioprospecting in Marine Environments.</p> <p>Ocean acidification and its significance, Red tides.</p>	15
Unit-II Applications of Marine Biotechnology	<ul style="list-style-type: none"> • Marine Bioactive as Potential Nutraceuticals and functional food and Cosmetics. • Seaweeds for removal of metal pollutants. • GFP, RFP characteristics and their applications • Green mussel adhesive protein • Biomimetics • Algal biofuels • Marine Extremozymes and their Significance. 	15



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Unit-III Marine Food Technology	<p>Preservation and processing of marine food: Chilling method, Drying, salt curing, pickling and smoking; Freezing and cold storage, Thawing, Canning; Role of preservatives in processing.</p> <p>Packaging – fresh fish, frozen fish, individually quick frozen (IQF) products.</p> <p>Fishery by-products-Fish Meal, Fish Oils, Fish Silage, Fish gelatin, Fish calcium, Chitin & Chitosan , Hydroxyapatite.</p> <p>Indicators for freshness determination of fish.</p> <p>Food Safety & Standards Authority of India (FSSAI): Ensuring food quality.</p>	15
Unit-IV Aquaculture Technology	<p>Importance of coastal aquaculture; Aqua farms: Design and construction; Criteria for selecting cultivable species; Culture systems and management practices, Seed production in controlled condition.</p> <p>Fish Feed Technology: Types of feed, conventional feed vs functional feeds; Principles of feed formulation and manufacturing, Culture of Live food organisms.</p> <p>Bio-floc technology; Aquaponics; Zero water exchange aquaculture system; Aqua mimicry; Hydroponics; Raceway system of aquaculture.</p> <p>Micro-algae-indoor and mass-culture methods, Biotechnological approaches for production of important microalgae and other commercial important products.</p>	15
References		
<ol style="list-style-type: none"> 1. Handbook of Fish and Marine Product Processing. 2. Se-kwon Kim, S.K. Springer Handbook of Marine Biotechnology; Springer: Berlin, Germany; Heidelberg, Germany, 2015. 3. Nollet, Leo M. L- Marine microorganisms- extraction and analysis of bioactive compounds-CRC Press_Taylor& Francis (2017) 4. R. S. K. Barnes, R. N. Hughes(auth.)-An Introduction to Marine Ecology, Third Edition-Wiley-Blackwell (1999) 5. Fabio Rindi, Anna Soler-Vila, Michael D. Guiry (auth.), Maria Hayes (eds.)-Marine Bioactive Compounds_ Sources, Characterization and Applications-Springer US (2012) 6. Reference for marine food technology https://mail.google.com/mail/u/0/?tab=rm&ogbl#inbox/FMfcgzGkXctXBqxHDBtSqmdmrVzSznfn?projector=1&messagePartId=0.1 7. Trends in Fish Processing Technology ; Edited by Daniela Borda, Anca I. Nicolau, Peter Raspor : CRC Press Taylor and Farancis Group 8. Fish Processing Technology Second edition Edited by G.M.HALL Lecturer Food Engineering and Biotechnology Group Loughborough University. 		



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SEMESTER V		
Course Code	Title	Credits
UBT5BIS	Paper-V (Applied Component: Biosafety)	2.0
Course Objectives	<p>CO1-Students will be acquainted with the biosafety regulation in Biotechnology.</p> <p>CO2-Students will be familiar with Biosafety Guidelines</p> <p>CO3-Learners will understand how to detect potential contamination risks for products.</p> <p>CO4-Students will be able to develop the concepts of biosafety in Biotechnology.</p>	
Learning Outcomes	<p>By the end of the course the student will be able to:</p> <ul style="list-style-type: none"> • Gain an overview regarding Biosafety guidelines, various levels, role of Institutional committee. • Understand regarding Microbiological testing in pharmaceuticals & common microbial contaminants. • Gain knowledge about the regulation in r-DNA technology along with understanding of bioethics. 	
UNIT	Topics	Lectures
Unit-I Introduction to Biosafety	<p>Introduction, Biological Risk Assessment, Hazardous Characteristics of an Agent</p> <p>Genetically modified agent hazards; Cell cultures</p> <p>Hazardous Characteristics of Laboratory Procedures</p> <p>Potential Hazards Associated with Work Practices</p> <p>Safety Equipment and Facility Safeguards</p> <p>Pathogenic risk and management</p>	12
Unit-II Biosafety Guidelines and Regulation	<p>Biosafety guidelines integrated with Government of India;</p> <p>Definition of GMOs & LMOs;</p> <p>Regulations and Guidelines on Biosafety: Scope of Regulation, Competent Authorities,</p> <p>Roles of Institutional Biosafety Committee, RDAC, IBSC, RCGM, GEAC, SBCC, DLC etc. for GMO applications in food and agriculture;</p> <p>Environmental release of GMOs; Risk Analysis, Risk Assessment and Risk management.</p>	12
Unit-III Detection and testing of contaminants	<p>Microbial Contamination in food and pharma product;</p> <p>Some common microbial contaminants;</p> <p>Microbiological Assays for pharmaceutical products;</p> <p>Regulatory Microbiological testing in pharmaceuticals.</p>	12



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Unit-IV Biosafety in Biotechnology	Concepts on biosafety in Biotechnology, Regulating rDNA technology, Regulating food and food ingredients, Genetically engineered crops, Livestock Bioethics; Contemporary issues in Bioethics. Alteration of the Nutritional Content of Food, Controversy about the Labeling of Genetically Modified Foods. Concerns about the Impact of Genetically Modified Organisms on the Environment.	12
References		
<ol style="list-style-type: none">1. Pharmaceutical Microbiology - Hugo, W.B, Russell, A.D 6th edition Oxford Black Scientific Publishers.2. Biosafety in Microbiological and Biomedical Laboratories - 5th Edition, L. Casey Chosewood Deborah E. Wilson U.S. Department of Health and Human Services Centers for Disease Control and Prevention National Institutes of Health.3. Molecular Biotechnology –Principles and Applications of Recombinant DNA Glick, B.R, Pasternak, J.J Patten, C.L 4th edition ASM press4. Joshi, R.; Biosafety and Bioethics (Ed.) (2006), Isha Books, Delhi.5. Department of Biotechnology, Ministry of Science and Technology, Government of India; Revised guidelines for safety in biotechnology. Available from: http://dbtbiosafety.nic.in/guideline/pdf/guidelines94.pdf.		



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SEMESTER V		
Course Code	Title	Credits
UBT5PR1	Practicals of Cell biology+ Medical Microbiology & Instrumentation	3.0
<ol style="list-style-type: none">1. Demonstration: Principle, working and applications of FTIR.2. MIC and MLC of any one antibiotic3. Antibiotic sensitivity test using agar cup method4. Antibiotic sensitivity test using paper disc method5. Antibiotic sensitivity test using ditch method.6. Synergistic Action of two drugs7. Cancer Biology: (Field visit and 2 page report in the journal)8. Chick embryo candling and inoculation methods Demonstration experiment9. Isolation of coliphages from Sewage and Determining Bacteriophage Titers (demonstration)10. Preparation of TAB vaccine.11. To check COVID antigen by kit method(demonstration/Video)12. Study through permanent slides and photographs. Meristems, structure of anther, (Female gametophyte: Polygonum (monosporic) type of Embryo sac Development.13. Dissection of embryo/endosperm from developing seeds.		



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SEMESTER V		
Course Code	Title	Credits
UBT5PR2	Practicals of Genomes and Molecular Biology + Marine Biotechnology	3.0
<ol style="list-style-type: none">1. Transformation in <i>E.coli</i>.2. Conjugation3. Replica plate4. Genomic DNA Extraction: Animal cells.5. Phage titration: Demonstration6. Gradient plate technique7. Bacterial gene expression (Kit may be used).8. Formulation of Fish Feed using Ingredients from Plant Sources and their standardization.9. DPPH assay for antioxidant extracted from marine algae10. Extraction of carotenoids from marine algae/Bacteria/Fungi.11. Extraction and estimation of Gelatin from marine source.12. Extraction of Collagen from marine source.13. Extraction of alkaloids from marine organisms and their separation by TLC.14. Preparation of fish silage.		

SEMESTER V		
Course Code	Title	Credits
UBT5PR3	Practicals of Applied Component: Biosafety	2.0
<ol style="list-style-type: none">1. Validation of autoclave2. Vitamin B12 bioassay3. To check sterility of injectable.4. Testing for adulterants in food.5. Operation and safety precautions: Fire, handling of chemicals etc.6. Sterile testing methods for pharmaceutical products.7. Isolation of pathogenic bacteria from fomites on operating room of pharmaceutical industry/ Packaging material of pharmaceutical product etc.8. A case study on clinical trials of drugs in India with emphasis on ethical issues.9. Case study on medical errors and negligence.10. Case study on handling and disposal of laboratory waste.11. Effects of storage and processing on the nutritive value of certain foods.		



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SEMESTER-VI



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SEMESTER VI		
Course Code	Title	Credits
UBT6BIC	Paper-I (Biochemistry)	2.5
Course Objectives	<p>CO1- Students will learn the levels of protein structure and protein-ligand interactions</p> <p>CO2- Analyze the metabolism of carbohydrates and fates of various intermediate and end product.</p> <p>CO3- Students will get knowledge of different protein purification techniques.</p> <p>CO4- Students will learn about different hormones and their biochemical functions with associated disorders.</p> <p>CO5- Students will get knowledge of protein denaturation and folding.</p>	
Learning Outcomes	<p>Learning outcomes: By the end of the VI course the student will be able to:</p> <ul style="list-style-type: none"> • Understand the quaternary protein ligand interactions, protein folding and degradation. • Understand the biosynthetic pathways and regulation of biomolecules like carbohydrates and lipids. • Learn the various functioning of endocrine gland secretions with their associated disorders. 	
UNIT	Topics	Lectures
Unit-I Protein Biochemistry	<p>Quaternary structure of proteins with special reference to Hemoglobin, cooperative oxygen binding and Concerted and sequential models for allosteric proteins.</p> <p>Protein denaturation, Folding and role of Molecular Chaperons, Protein degradation basic concept.</p> <p>Protein Purification techniques: Principle and applications of Dialysis, salting and salting-out, gel filtration, ion exchange, FPLC, affinity and hydrophobic interaction chromatography.</p>	15
Unit-II Metabolism	<p>Carbohydrate biosynthesis and its regulation: Peptidoglycan in Bacteria; Starch and sucrose in Plants, Glycogen in Animals, inborn errors of glycogen metabolism.</p> <p>Biosynthesis and regulation of Cholesterol, Atherosclerosis.</p>	15
Unit-III Endocrinology-I	<p>Classification of hormones: Mechanism of action of group I and II hormones.</p> <p>Hormones of Hypothalamus and pituitary gland</p> <p>Anterior Pituitary Hormones: GH</p> <p>Posterior Pituitary Hormones: Oxytocin and Vasopressin</p>	15



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	<p>Thyroid hormones: Biosynthesis, Biochemical and physiological functions, disorders and thyroid function tests.</p> <p>Hormones that regulate Calcium metabolism: PTH and Calcitriol.</p> <p>Chemistry, Biochemical and physiological functions of androgens, estrogens and progesterone. Hormonal regulation of menstrual cycle, Hormonal contraception. Placental hormones.</p>	
Unit-IV Endocrinology-II	<p>Hormones of Adrenal Cortex: Glucocorticoids and Mineralocorticosteroids- Biochemical and physiological functions and disorders.</p> <p>Hormones of Adrenal Medulla: Synthesis, Biochemical and physiological functions and disorders of Catecholamines.</p> <p>Hormones of pancreas: structure, biochemical and physiological functions and disorders: Insulin and glucagon. Diabetes mellitus, hypoglycemia. Glucose tolerance test. Recombinant Insulin.</p>	15
References		
<ol style="list-style-type: none">1. Lehninger, principles of biochemistry, 7th edition (2005), David Nelson and Michael Cox W.H. Freeman and Company, New York.2. Biochemistry, 4th edition (2010), Voet and Voet, John Wiley and sons, USA3. Harper's Illustrated Biochemistry, 27th edition, RK Murray, DK Granner, PA Mayes and VW Rodwell, McGraw Hills publication.4. Biochemistry, 4nd edition (2017), Satyanarayana and Chakrapani, Books & Allied (P) Ltd5. Nutrition Science, 6th edition (2017), Srilakshmi, new age international publishers		



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SEMESTER VI		
Course Code	Title	Credits
UBT6IMI	Paper-II (Industrial Microbiology)	2.5
Course Objectives	<p>CO1-Students will learn the production outline of various dairy products.</p> <p>CO2-Students will learn the different modes of fermentation and Down-stream Processing.</p> <p>CO3-Students will learn to develop strategy for fermentation process development</p> <p>CO4-Students will understand the Standard operating procedures, GMP and QA and QC.</p>	
Learning Outcomes	<p>By the end of the course the student will be able to:</p> <ul style="list-style-type: none"> • Understand various fermentation processes. • Learn outline of Down-streaming processing and understand various methods applied in solvent recovery, cell disruption & separation. • Gain knowledge regarding requirements of QA-QC along with various documentation & Audit reports. 	
UNIT	Topics	Lectures
Unit-I Dairy Technology	<p>Milk: Normal flora, changes in raw milk, Enumeration</p> <p>Factors affecting bacteriological quality</p> <p>Dairy technology Preservation methods, Pasteurization</p> <p>Starter Cultures</p> <p>Fermented products-Production process and spoilage of Cheese, Swiss and Cheddar, Butter, Yogurt and Buttermilk.</p>	15
Unit-II Fermentation process	<p>Introduction to Inoculum development, Bacterial and fungal inoculum development with one example each</p> <p>Scale up, Scale down</p> <p>Production of: Streptomycin, Protease, Glutamic acid, Lysine, ethanol production Semi-synthetic Penicillin, Wine</p> <p>Mushroom cultivation</p> <p>Biotransformation</p>	15
Unit-III Down-stream Processing (DSP)	<p>Introduction of DSP</p> <p>Foam separation, Types of Precipitation, Filtration, Centrifugation, Chromatography in DSP</p> <p>Cell disruption- physical and chemical methods; Solvent recovery, Membrane processes, Drying, Crystallization.</p> <p>Whole broth processing</p>	15



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Unit-IV QA-QC	Concept of GMP Requirements of GMP implementation, Documentation of GMP practices, Regulatory certification of GMP. Quality Control (QC): Concept of QC, Requirements for implementing QC, QA concepts: Concept of QA, Requirements for implementing. Calibration records (QA-QC), Validation of methods; Documentation of results; Audits and Audit reports.	15
References		
<ol style="list-style-type: none">1. Applied Dairy Microbiology Elmer H Marth and James L Steele MerceL Dekker Inc New York, 2nd edition2. Fundamentals of Microbiology by Frobisher, 9th Ed3. Microbial Technology Peppler,H.J and Perlman,D 2nd Academic Press Practicals4. Industrial Microbiology Prescottt and Dunn CBS publishers5. Industrial microbiology by Casida6. Industrial Microbiology by A.H. Patel7. Dairy technology by Yadav and Grower8. Fermentation technology by Stanbury and Whitaker9. Pharmaceutical Microbiology by Hugo and Russel		



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SEMESTER VI		
Course Code	Title	Credits
UBT6PNE	Paper-III (Pharmacology and Neurochemistry)	2.5
Course Objectives	<p>CO1- Students will learn the mechanism of drug action and its dose–response relationship.</p> <p>CO2- Students will learn the mechanisms of drug delivery and action in the body.</p> <p>CO3- Students will get in depth knowledge on toxic substances and poisons ie. Toxicology.</p> <p>CO4- Students will understand the properties of cells that make up the nervous system including the propagation of electrical signals used for cellular communication.</p>	
Learning Outcomes	<p>By the end of the course the student will be able to:</p> <ul style="list-style-type: none"> • Learn the basic concept of mechanism of drug action • Learn drugs and their poisonous effect if the administered for longer period of time • Understand the basic concept of poisons and their types. • Gain the knowledge of basic neurochemistry and action of specific drugs on the Central Nervous System. 	
UNIT	Topics	Lectures
Unit-I General principles of Pharmacology	<p>Mechanism of drug action; drug receptors and biological responses; second-messenger systems, the chemistry of drug–receptor binding; dose–response relationship: therapeutic index; ED, LD; Potency and Intrinsic Activity; Drug antagonism</p> <p>Definition: Drugs, Small molecules, Large Molecules/ Biologics and biosimilars with example.</p> <p>Similarities and Differences: Small molecules versus generics, Biologics versus Biosimilars.</p>	15
Unit-II Drug Absorption Distribution Metabolism and Excretion	<p>Absorption of drugs from the alimentary tract; factors affecting rate of gastrointestinal absorption; absorption of drugs from lungs; skin; absorption of drugs after parenteral administration factors influencing drug distribution; binding of drugs to plasma proteins; Physiological barriers to drug distribution.</p> <p>Drug Metabolism: sites of drug metabolism and phases of Metabolism.</p> <p>Drug Excretion: Renal and Non-renal Drug Elimination.</p>	15



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Unit-III Basic Toxicology and Regulatory Toxicology	<p>Background Definitions; Causation: degrees of certainty Classification; Causes Allergy in response to drugs Effects of prolonged administration: chronic organ toxicity; Adverse effects on reproduction.</p> <p>Poisons: Deliberate and accidental self-poisoning Principles of treatment Poison-specific measures General measures; Specific poisonings: cyanide, methanol, hydrocarbons, volatile solvents, heavy metals; herbicides and pesticides; biological substance (overdose of medicinal drugs is dealt with under individual agents);</p> <p>Incapacitating agents: drugs used for torture; Nonmedical use of drugs.</p>	15
Unit-IV Neurochemistry	<p>Anatomy and functioning of the brain; Neuronal pathways (Introduction);</p> <p>Propagation of nerve impulses; Neuronal excitation and inhibition; Synapses and gap junctions;</p> <p>Action of Neurotoxins and neurotransmitters.</p> <p>Drugs affecting the Central Nervous System:-Agents Affecting Neuromuscular transmission, Sedative-hypnotic and Anxiolytic drugs, drugs Used in Neurodegenerative Disorders, Antiepileptic Drugs.</p>	15
References		
<ol style="list-style-type: none">1. Modern Pharmacology with clinical Applications Craig,C.R, Stitzel,R.E 5th edition.2. Casarett & Doull's Toxicology - The Basic Science of Poisons (6th Edition).3. Clinical Pharmacology Bennet, PN, Brown,M.J, Sharma,P 11th edition.4. Textbook of Medical Physiology Guyton, A.C and Hall 11th edition J.E Saunders5. Biochemistry Metzler, D.E Elsevier6. Gerard Marshall Raj Ramasamy Raveendran: Introduction to Basics of Pharmacology and Toxicology, Volume 1: General and Molecular Pharmacology: Principles of Drug Action springer.		



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SEMESTER VI		
Course Code	Title	Credits
UBT6ENB	Paper-IV (Environmental Biotechnology)	2.5
Course Objectives	<p>CO1- Students will learn the concepts of solar energy, wind power, geothermal energy and hydropower, biomass energy, Biogas technology and Biofuels.</p> <p>CO2- Students will understand the techniques and strategies of Industrial effluent treatment.</p> <p>CO3- Students will understand the techniques of waste water management.</p> <p>CO4- Students will be Exposed to the processes which are currently associated and taking place in industry along with their consequences on generation of hazardous waste.</p>	
Learning Outcomes	<p>By the end of the course the student will be able to:</p> <ul style="list-style-type: none"> • Understand aspects and utilization of renewable energy sources for both domestics and industrial application. • Understand the current applications of biotechnology to environmental quality evaluation, monitoring and remediation of contaminated environments. • Identify the most common techniques for preventing, minimizing, recycling, disposing and treatment of waste and their application on site remediation. 	
UNIT	Topics	Lectures
Unit-I Renewable Sources of Energy	<p>Energy sources renewable solar energy, wind power, geothermal energy and hydropower.</p> <p>Biogas technology- biogas plant & types, biodigester.</p> <p>Biogas- composition, production and factors affecting production, uses.</p> <p>Biomass energy, Biofuels – ethanol production, Microbial hydrogen production, Biodiesel, Petrocrops.</p>	15
Unit-II Industrial Effluent Treatment	<p>Biological processes for industrial effluent treatment, Aerobic biological treatment- activated sludge process, CASP, advanced activated sludge processes (any two) Biological filters, RBC, FBR Anaerobic biological treatment- contact digesters, packed bed reactors, anaerobic baffled digesters, UASB</p> <p>Solid waste treatment: Green Manure, Bio- compost making methods Types and methods of vermicomposting, field applications.</p> <p>Pollution indicators, Biosensors</p>	15



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	<p>Biodegradation of xenobiotics- persistent compounds, chemical properties influencing biodegradability, microorganisms in biodegradation.</p> <p>Use of immobilized enzymes or microbial cells for treatment.</p>	
Unit-III Wastewater Treatment	<p>Wastewater treatment Introduction, biological treatment, impact of pollutants on bio-treatment,</p> <p>Use of packaged organisms and genetically engineered organisms in waste treatment.</p> <p>Heavy metal pollution – sources, microbial systems for heavy metal accumulation, techniques used for heavy metal removal.</p> <p>Biosorption by bacteria, fungi and algae</p> <p>Factors affecting biosorption and Limitations of biosorption</p>	15
Unit-IV Hazardous Waste Management	<p>Biodegradation of waste from:</p> <ul style="list-style-type: none"> • Tanning industry • Petroleum industry • Paper & pulp industry • Dairy industry • Distillery • Dye industry • Antibiotic industry • Removal of oil spillage & grease deposits 	15
References		
<ol style="list-style-type: none"> 1. Environmental Biotechnology Alan Scragg Oxford University press 2. Environmental Biotechnology M.H. Fulekar Oxford & IBH Publishing Co. Pvt. Ltd. 3. Environmental Biotechnology (Basic concepts and applications) Indu Shekar Thakur IK International 4. Environmental Biotechnology (Industrial pollution management) S.N. Jogdand Himalaya Publishing House 		



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SEMESTER VI		
Course Code	Title	Credits
UBT6ABT	Paper-V (Applied Component: Agribiotechnology)	2.0
Course Objectives	<p>CO1-Students will be Exposed to technology and the techniques that can be used to improve the efficiency of agricultural operations like greenhouse technology.</p> <p>CO2-Students will develop knowledge crop improvement methods.</p> <p>CO3- They will gain the knowledge of different markers used in plant breeding techniques'</p> <p>CO4-Students will gain concept of bio-fertilizers, Symbiotic-Non symbiotic nitrogen fixation in leguminous plant, assimilation of phosphorus and biopesticides.</p>	
Learning Outcomes	<p>By the end of the course the student will be able to:</p> <ul style="list-style-type: none"> • Understand greenhouse technology and its uses. • Understand the methods of plant improvement and use of microbes as bio-fertilizers, PGRs and bio-pesticides. • They will also learn about genetic and molecular markers in plant breeding along with DNA barcoding. 	
UNIT	Topics	Lectures
Unit-I Precision Agriculture and Agriculture system	<p>Introduction to Agriculture and Agriculture systems- Greenhouse Technology-- Types of green house, importance, functions and features of green house, Design criteria and calculation.</p> <p>Construction material, covering material and its characteristics, growing media, green house irrigation system. Nutrient management.</p> <p>Greenhouse heating, cooling and shedding and ventilation system, Computer controlled environment. Phytotrons, fertigation and roof system.</p> <p>Precision Cultivation- tools, sensors for information acquisition.</p>	12
Unit-II Biotechnology for Crop Improvement	<p>Production of virus free plants- shoot meristem culture, micro propagation, production of Haploid plants, somatic hybridization and cybridization, synthetic seeds.</p> <p>Molecular Pharming, edible vaccines.</p> <p>Development of salt resistant, fungal resistant and herbicide resistant plants by genetic engineering.</p> <p>Hydroponics: an overview of techniques and media used.</p>	12



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Unit-III Molecular Markers in Plant Breeding	<p>Genetic markers in plant breeding-classical markers, DNA markers (RFLP, RAPD, AFLP, SSR, SNP)</p> <p>Application of Molecular Markers to Plant Breeding [quantitative trait locus (QTL) mapping]</p> <p>Plant DNA Barcoding- Barcoding Markers (matK, rbcl, ITS, tmH-psbA), steps, recent advances, Benefits, Limitations.</p>	12
Unit-IV Bio-fertilizers and Bio-pesticides	<p>Bio-fertilizer: Nitrogen-fixing Rhizobacteria - Symbiotic Nitrogen Fixers and Nonsymbiotic Nitrogen Fixers.</p> <p>Plant Growth Promoting Microorganisms-Phosphate-Solubilizing Microbes (PSM).</p> <p>Plant Growth Promotion by Fungi-- Mycorrhizae Arbuscular Mycorrhizae Ectomycorrhizae.</p> <p>Microbial Inoculants -- Inocula, Carriers, and Applications, Monoculture and Co-culture Inoculant Formulations Biocontrol, Polymicrobial Inoculant Formulations.</p> <p>Biopesticides – types, <i>Bacillus thuringiensis</i>, insect viruses and entomopathogenic fungi (characteristics, physiology, mechanism of action and application).</p>	12

References

1. M. Ajmal Ali, G. Gyulai, F. Al-Hemaid -Plant DNA Barcoding and Phylogenetics, LAP Lambert Academic Publishing (2015)
2. P. Parvatha Reddy (auth.)-Sustainable Crop Protection under Protected Cultivation Springer Singapore (2016)
3. S.B. Anderson (ed.), Plant Breeding from Laboratories to Fields, InTech,2013
4. Travis R. Glare, Maria E. Moran-Diez - Microbial-Based Biopesticides_ Methods and Protocols (2016, Humana Press)
5. Arie Altman, Paul Michael Hasegawa-Plant Biotechnology and Agriculture_ Prospects for the 21st Century-Academic Press (2011
6. Bhojwani, S.S. and Razdan 2004 Plant Tissue Culture and Practice.
7. Slater, A., Scott, N.W. & Fowler, M.R. 2008 Plant Biotechnology: The Genetic Manipulation of Plants, Oxford University Press.
8. Advanced Biotechnology by R.C. Dubey S Chand publication.



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SEMESTER VI		
Course Code	Title	Credits
UBT6PR1	Practicals of Biochemistry + Industrial Microbiology	3.0
<ol style="list-style-type: none">1. Protein separation by salting out.2. Demonstration of dialysis3. Separation of components from a mixture using Affinity chromatography (Kit may be used)4. Separation of components from a mixture using Size exclusion chromatography5. Estimation of Milk protein-Pynes method6. Microbial analysis of Milk by MBRT and RRT7. Phosphatase test in Milk8. DMC of milk sample9. Isolation of Normal flora from Milk and curd10. Wine production and testing.11. Determination of blood glucose levels for detection of diabetes mellitus.12. Determination of serum cholesterol (total, HDL and LDL ratio)13. Estimation of Glycogen14. Identification questions based on hormones (Case study).		

SEMESTER VI		
Course Code	Title	Credits
UBT6PR2	Practicals of Pharmacology - Neurochemistry and Environmental Biotechnology and Project Work	3.0
<ol style="list-style-type: none">1. LD 50, ED 50 evaluation using suitable models e.x <i>Daphnia</i>, <i>Chironomus</i> larvae.2. Study the effect of heavy metals on the growth of bacteria.3. Determination of Total Solids from an effluent sample.4. Study of physico-chemical (pH, color, turbidity, BOD, COD) parameters of any one industrial effluent sample.5. Estimation of chromium from Effluents (Demonstration)6. Visit to ETP/ CETP/ Vermi-compost unit.7. Short-term Project .		



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	SEMESTER VI	
Course Code	Title	Credits
UBT6PR3	Practicals of Applied Component: Agribiotechnology	2.0
<ol style="list-style-type: none">1. RAPD analysis demonstration experiment.2. Isolation of Rhizobium.3. Isolation of Azotobacter.4. Isolation of Phosphate solubilising bacteria5. Rapid screening tests for abiotic stress tolerance (drought, - PEG, Mannitol & salinity NaCl).6. To estimate the Proline content in salt stressed plants.7. Preparation of synthetic seeds.8. Micropropagation of suitable plant species.9. Preparation of bio-fertilizer.10. To observe effect of bio-fertilizer on plant growth.11. Preparation of hydroponic solution and hydroponic culture.12. Visit to the greenhouse facility and submission of a field visit report.		

T.Y.B.Sc. Zoology



**Janardan Bhagat Shikshan Prasarak Sanstha's CHANGU KANA THAKUR
ARTS, COMMERCE & SCIENCE COLLEGE, NEW PANVEL (AUTONOMOUS)**

Re-accredited 'A+' Grade by NAAC

'College with Potential for Excellence' Status Awarded by

UGC

'Best College Award' by University of Mumbai

Program: B.Sc Zoology Revised Syllabus of T.Y.B.Sc. Zoology

Choice Based Credit & Grading System (60:40)

w.e.f. Academic Year 2021-2022

T.Y.B.Sc. Zoology

Sr. No.	Heading	Particulars
1	Title of Course	Zoology
2	Eligibility for Admission	S.Y.B.Sc. with subject Zoology
3	Passing marks	40%
4	Ordinances/Regulations (if any)	
5	No. of Semesters	Two
6	Level	U.G.
7	Pattern	Semester (60:40)
8	Status	Revised
9	To be implemented from Academic year	2021-2022

PREAMBLE OF THE SYLLABUS

The ongoing B.Sc. Zoology course was introduced by the Faculty of Sciences from the academic year 2019-2020. The Revised Syllabus of T.Y.B.Sc. Zoology (CBCGS) that will be effective from the academic year 2021- 2022, will follow the Semester mode. It has been prepared keeping in view the unique requirements of B.Sc. Zoology students. The syllabus has been drawn up to introduction of the classical zoology with accommodation of widening horizons of the discipline of Biological Sciences.

The Board of Studies examined the existing syllabus and after analyzing with respective subjects in term of content relevance, quality and pattern of teaching along with examination in present scenario.

With the holistic approach the syllabus including basic as well as advanced concepts in Zoology from first year to third year shall inspire the students for pursuing higher studies in Zoology and for becoming an entrepreneur and also enable students to get employed in the biological research Institutes, Industries, Educational Institutes and in the various concerning departments of State and Central Government based on subject Zoology.

Program Specific Outcomes

- PSO1** Gain the comprehensive knowledge and understanding of major concepts, theoretical principles and experimental findings in Zoology and its different subfields.
- PSO2** Learn a wide range of approaches, from genetics to molecular and cellular biology, well as physiological processes and anatomy, and diseases
- PSO3** Spread awareness about wildlife and ecology as well as the environment and its conservation in the society
- PSO4** Gain knowledge of Agro based Small Scale industries like sericulture, aquaculture and vermicomposting.
- PSO5** Develop the interest and employability, program includes learning experiences which offer opportunities for higher studies and research at reputed laboratories
- PSO6** Understand the concept of research and its type along with basic knowledge of qualitative research techniques, data collection and process of scientific documentation.
- PSO7** Analyze the ethical aspects of research and evaluate the different methods of scientific writing and reporting by appropriate documentations and presentations.

OBJECTIVES OF THE COURSE

Zoology deals with the study of animal kingdom along with the different realm. The main focus of curriculum is to enable the learner to be professionally competent and successful in career.

- The learners to be proficient in identification of animals by studying modern system of classification.
- Learners will learn the skill required to study or perceive laboratory and experimental work such as Molecular Biology, Genetic Engineering, Human Genetics and Bioinformatics.
- Learners will achieve proficiency in the skills necessary for the study of haematology and immunology.
- Introduce the learners to principles of toxicology with particular emphasis on toxic responses and toxicity testing and obtain knowledge and practical skills in the toxicology.
- To make the learners to understand the principal concepts of biostatistics, collect data relating to variable/variables, which can be examined and descriptive statistics can be calculated from these data.
- Aim to introduce various tools and their applications in bioinformatics and statistical studies.
- To make learner understand various concepts of endocrinology, developmental biology, integumentary system and human osteology.
- To introduce the learners to understand the importance of different factors of environment and its management, importance of wildlife conservation, zoopharmacognosy and zoogeography.

EXPECTED OUTCOME OF SYLLABUS

The present course of T.Y.B.Sc. Zoology introduced by the Board of studies and Faculty of Sciences from the academic year 2021-22 has some expected outcomes of entire syllabi as follows:

- The present syllabus helps to understand the basic concepts of animal taxonomy and zoological nomenclature and evaluate the significance of museum specimens.
- Students can learn about the historical development of systematic biology from 18th century to the present.
- The syllabus helps learners to understand the concepts, mechanisms, evolutionary significance and relevance of molecular biology in the current scenario.
- Learners will be familiar with the concepts of molecular biology and genetic engineering which holds application in biomedical & genomic science, agriculture, environment management, etc.
- Syllabus will help learners to identify the major cellular and tissue components which comprise the innate and adaptive immune system.
- The students learn about various aspects of enzymological assays and their applications in industries and study of basics histological techniques
- The students will gain a broad understanding of different areas of toxicology.
- Learners will know the theory behind fundamental bioinformatics analysis methods and acquire knowledge of various databases of proteins, nucleic acids, primary, secondary and composite databases like BLAST, FASTA etc. This will make them familiar with widely used bioinformatics databases.
- Learners will know basic concepts of probability and statistics which help them to describe statistical methods and probability distributions relevant for biological data analysis.
- Learners can understand the basic concepts of endocrinology and learn about the hypothalamus and hypophysial axis, endocrine glands and mechanism of hormone action.
- Learners will understand about environment and wildlife management, and learn the basic concepts of bioprospecting, zoopharmacognosy and zoogeography.

**Scheme of Examination
Faculty of Science
(Undergraduate Programmes)**

Choice Based Credit System (CBCS)

Revised Scheme of Examination

The performance of the learners shall be evaluated into two components. The learner's Performance shall be assessed by Internal Assessment with 40% marks in the first component by conducting the Semester End Examinations with 60% marks in the second component. The allocation of marks for the Internal Assessment and Semester End Examinations are as shown below: -

A) Internal Assessment: 40 %

40 Marks

Sr. No.	Particular	Marks
01	One periodical class test / online examination to be conducted in the given semester	20 Marks
02	Any two tools out of these (10 Marks each) 1. Group/ Individual Project 2. Presentation and write up on the selected topics of the subjects / Case studies. 3. Test on Practical Skills 4. Quiz	20 Marks

Question Paper Pattern

(Periodical Class Test/ online examination for the Courses at Under Graduate Programmes)

- ❖ Maximum Marks: 20
- ❖ Duration: 30 Minutes

Particular	Marks
Match the Column / Fill in the Blanks / Multiple Choice Questions/ True/False/Answer in One or Two Lines (Concept based Questions) (1 Marks each)	20 Marks

B) Semester End Examination: 60 %

60 Marks

Undergraduate Programmes of F. Y. B.Sc. (Sem. I & II) and S. Y. B.Sc. (Sem. III & IV)

- Duration: The examination shall be of 2 hours duration.

Question Paper Pattern

Theory question paper pattern

1. There shall be four questions of 15 marks each (30 marks with internal options).
2. On each unit there will be one question and fourth question will be based on entire syllabus.
3. All questions shall be compulsory with internal options.
4. Question may be subdivided into sub-questions a, b, c... and the allocation of marks depends on the weightage of the unit.

Undergraduate Programmes of T. Y. B.Sc. (Sem. V & VI)

- Duration: The examination shall be of 2 hours duration.

Question Paper Pattern

Theory question paper pattern

1. There shall be five questions each of 12 marks (24 marks with internal options).
2. On each unit there will be one question and fifth question will be based on entire syllabus.
3. All questions shall be compulsory with internal options.
4. Question may be subdivided into sub-questions a, b, c... and the allocation of marks depends on the weightage of the unit.

Passing Standard

The learners to pass a course shall have to obtain a minimum of 40% marks in aggregate for each course where the course consists of Internal Assessment and Semester End Examination. The learners shall obtain minimum of 40% marks (i.e. 16 out of 40) in the Internal Assessment and 40% marks in Semester End Examination (i.e. 24 Out of 60) separately, to pass the course and minimum of Grade D, wherever applicable, to pass a particular semester. A learner will be said to have passed the course if the learner passes the Internal Assessment and Semester End Examination together.

Evaluation pattern of the project work (50 Marks)

Student would undertake a project for 1-2 months during the semester.

Sr. No.	Particular	Marks
01	Project	50 Marks
	Documentation	25 Marks
	Presentation	15 Marks
	Viva	10 Marks

- ***The plagiarism should be maintained as per the UGC guidelines.***

Note: As per previous ordinance there will not be any internal examination for practical.

Note: 1) It is noted that the concerned regulation of the College is amended and implemented to all Semesters i.e. Semester I to Semester VI to all undergraduate programmes, under faculty of Arts, Commerce and Science with effect from the academic year 2022 - 2023.

2) This revised scheme of evaluation is discussed in detail, finalised and accepted

Question Paper Pattern for Semester End Examination

Theory: 60 Marks

I	Each theory paper shall be of two-hour duration.	
	All questions are compulsory and will have internal options.	
	Q-1	From Unit – I (having internal options.) 15 M
	Q-2	From Unit – II (having internal options.) 15 M
	Q-3	From Unit – III (having internal options.) 15M
	Q-4	From Unit – IV (having internal options.) 15M

Question Paper Pattern for Continuous Assessment (Total Marks 20 to be converted in 10 marks)

Marks	Group Project*/ Individual Project	Presentation and write-up	Practical Skills	Open book test	Quiz
5	Hypothesis/Topic of the project	Presentation skill	Demonstration of skill	High order thinking questions (HOTS)	Quiz on application of subject in real life
5	Actual laboratory work/Field work	Knowledge	Viva		
5	Result/output	Quality of ppt	Report		
5	Dissertation/Report	Writing skill	Problem solving ability		

Note

Group Project*

- 1) Define number of students
- 2) Every student will get equal marks if the same contribution
- 3) if any student without any kind of involvement in the project, guide will take the decision on his share

Question Paper Pattern for Practical Examination

T.Y.B.Sc. Zoology

II	Practical	The External examination per practical course will be conducted as per the Following scheme.
Sr. No.	Particulars of External Practical Examination	Marks
1.	Laboratory Work	35
2.	Field visit and report	05
3.	Journal	05
4.	Viva	05
	TOTAL	50

Syllabus for T.Y.B.Sc.

Course - ZOOLOGY

(Credit Based Semester and Grading System)

(To be implemented from the Academic Year 2021- 2022)

SEMESTER- V					
THEORY					
COURSE NO.	COURSE CODE	UNIT	TOPICS	CREDITS	LECTURES / WEEK
DSC 11	USC5Z01	I	Basics of Taxonomy, Trends in biosystematics and Dimensions of speciation	2.5	1
		II	Protista and Metazoa		1
		III	Non- Chordates		1
		IV	Type Study – Earthworm		1
DSC 12	USC5Z02	I	Basic Haematology	2.5	1
		II	Applied Haematology		1
		III	Basic Immunology		1
		IV	Applied Immunology		1
DSC 13	USC5Z03	I	Histology	2.5	1
		II	Toxicology		1
		III	Enzymology		1
		IV	Biostatistics		1
DSE 14	USC5Z04	I	Integumentary system and derivatives	2.5	1
		II	Human Osteology		1
		III	Introduction to Endocrinology		1
		IV	Peripheral Endocrine glands		1
				10	16
PRACTICAL					
USC5ZOP	Practicals based on all four courses			06	16

Total Number of Credits and Workload	16	32
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**Scheme of Examination
Faculty of Science
(Undergraduate Programmes)**

Choice Based Credit System (CBCS)

Revised Scheme of Examination

The performance of the learners shall be evaluated into two components. The learner's Performance shall be assessed by Internal Assessment with 40% marks in the first component by conducting the Semester End Examinations with 60% marks in the second component. The allocation of marks for the Internal Assessment and Semester End Examinations are as shown below: -

A) Internal Assessment: 40 %

40 Marks

Sr. No.	Particular	Marks
01	One periodical class test / online examination to be conducted in the given semester	20 Marks
02	Any two tools out of these (10 Marks each) 5. Group/ Individual Project 6. Presentation and write up on the selected topics of the subjects / Case studies. 7. Test on Practical Skills 8. Quiz	20 Marks

Question Paper Pattern

(Periodical Class Test/ online examination for the Courses at Under Graduate Programmes)

- ❖ Maximum Marks: 20
- ❖ Duration: 30 Minutes

Particular	Marks
Match the Column / Fill in the Blanks / Multiple Choice Questions/ True/False/Answer in One or Two Lines (Concept based Questions) (1 Marks each)	20 Marks

B) Semester End Examination: 60 %

60 Marks

Undergraduate Programmes of F. Y. B.Sc. (Sem. I & II) and S. Y. B.Sc. (Sem. III & IV)

- Duration: The examination shall be of 2 hours duration.

Question Paper Pattern

Theory question paper pattern

5. There shall be four questions of 15 marks each (30 marks with internal options).
6. On each unit there will be one question and fourth question will be based on entire syllabus.
7. All questions shall be compulsory with internal options.
8. Question may be subdivided into sub-questions a, b, c... and the allocation of marks depends on the weightage of the unit.

Undergraduate Programmes of T. Y. B.Sc. (Sem. V & VI)

- Duration: The examination shall be of 2 hours duration.

Question Paper Pattern

Theory question paper pattern

5. There shall be five questions each of 12 marks (24 marks with internal options).
6. On each unit there will be one question and fifth question will be based on entire syllabus.
7. All questions shall be compulsory with internal options.
8. Question may be subdivided into sub-questions a, b, c... and the allocation of marks depends on the weightage of the unit.

Passing Standard

The learners to pass a course shall have to obtain a minimum of 40% marks in aggregate for each course where the course consists of Internal Assessment and Semester End Examination. The learners shall obtain minimum of 40% marks (i.e. 16 out of 40) in the Internal Assessment and 40% marks in Semester End Examination (i.e. 24 Out of 60) separately, to pass the course and minimum of Grade D, wherever applicable, to pass a particular semester. A learner will be said to have passed the course if the learner passes the Internal Assessment and Semester End Examination together.

Evaluation pattern of the project work (50 Marks)

Student would undertake a project for 1-2 months during the semester.

Sr. No.	Particular	Marks
01	Project	50 Marks
	Documentation	25 Marks
	Presentation	15 Marks
	Viva	10 Marks

- ***The plagiarism should be maintained as per the UGC guidelines.***

Note: As per previous ordinance there will not be any internal examination for practical.

Note: 1) It is noted that the concerned regulation of the College is amended and implemented to all Semesters i.e. Semester I to Semester VI to all undergraduate programmes, under faculty of Arts, Commerce and Science with effect from the academic year 2022 - 2023.

2) This revised scheme of evaluation is discussed in detail, finalised and accepted

Syllabus for T.Y.B.Sc.

Course-ZOOLOGY

(Credit Based Semester and Grading System)

(To be implemented from the Academic Year 2021-2022)

SEMESTER-VI					
THEORY					
COURSE NO.	COURSE CODE	UNIT	TOPICS	CREDITS	LECTURES/ WEEK
DSC 15	USC6Z01	I	Chordata	2.5	1
		II	Euchordata I		1
		III	Euchordata II		1
		IV	Type study - Shark		1
DSC 16	USC6Z02	I	Molecular Biology	2.5	1
		II	Genetic Engineering		1
		III	Human Genetics		1
		IV	Bioinformatics		1
DSC 17	USC6Z03	I	Basic concept Developmental biology	2.5	1
		II	Gametogenesis, fertilization and early		1
		III	Morphogenesis and organogenesis in animals		1
		IV	Chick Embryology		1
DSE18	USC6Z04	I	Environment management	2.5	1
		II	Wildlife management		1
		III	Bioprospecting and		1
		IV	Zoogeography		1
				10	16
PRACTICAL					
USC6ZOP	Practical's based on all four courses			06	16
Total Number of Credits and Workload				16	32

**SYLLABUS T.Y.B.Sc.
ZOOLOGY
UNIT WISE DISTRIBUTION**

Semester V			
Core Course 11	Core Course 12	Core Course 13	Discipline Specific Elective 14
Unit 1 Basics of Taxonomy, Trends in biosystematics and Dimensions of speciation	Unit 1 Basic Hematology	Unit 1 Histology	Unit 1 Integumentary system and derivatives
Unit 2 Protista and Metazoa	Unit 2 Applied Hematolog y	Unit 2 Toxicology	Unit 2 Human Osteology
Unit 3- Non- Chordates	Unit 3 Basic Immunology	Unit 3 Enzymology	Unit 3 Introduction to Endocrinology
Unit 4 Type Study - Earthworm	Unit 4 Applied Immunology	Unit 4 Biostatistics	Unit 4 Peripheral Endocrine glands
Practical (USC5ZOP1)	Practical (USC5ZOP2)	Practical (USC5ZOP3)	Practical (USC5ZOP4)

**SYLLABUS T.Y.B.Sc.
ZOOLOGY
UNIT WISE DISTRIBUTION**

Semester VI			
Core Course 15	Core Course 16	Core Course 17	Discipline Specific Elective 18
Unit 1 Chordata	Unit 1 Molecular Biology	Unit 1 Basic concept Developmental biology	Unit 1 Environmenta l Management
Unit 2 Euchordata- I	Unit 2 Genetic Engineering	Unit 2 Gametogenesis, fertilization and early development	Unit 2 Wildlife Management
Unit 3 Euchordata- II	Unit 3 Human Genetics	Unit 3 Morphogenesis and organogenesis in animals	Unit 3 Bioprospecting and Zoo pharmacognosy
Unit 4 Type Study- Shark	Unit 4 Bioinformatics	Unit 4 Chick Embryology	Unit 4 Zoogeography
Practical (USC6ZOP1)	Practical (USC6ZOP2)	Practical (USC6ZOP3)	Practical (USC6ZOP4)

Syllabus for T.Y.B.Sc.

Program B.Sc.

Course: ZOOLOGY

Semester V Paper I and Practical I

T.Y.B.Sc. Zoology Semester V (Theory)

Course Code: USC5Z01

Core Course 11

Principles of Taxonomy, Modern Trends in Taxonomy and study of invertebrates

Course objectives:

To introduce the basics of taxonomy along with the study of invertebrates.

Course outcome:

- *Learners will understand the basics concept of taxonomy and learn to classify animals on the basis of their relation to other animals by body structure, external characters and development*
- *Apply the International rules of Nomenclature to give a scientific name to animals which are found during research.*
- *Understand the gradual development and evolutionary history of different kinds of living organisms from earlier forms over several generations*
- *Understand and demonstrate the internal anatomy of various animals, biodiversity and related indices.*

Unit 1: Basics of Taxonomy, Trends in biosystematics and Dimensions of speciation

(15 lectures)

Learning objectives:

To introducing the students for the basic concepts of Taxonomy and trends in biosystematics.

Desired outcome:

Learners will understand the rules of nomenclature and other theories, concepts and principles of taxonomy.

1.1 : Definition and basic concept of biosystematics taxonomy and classification.

- a. Introduction,
- b. Definition of taxonomy,
- c. Definition of Systematics
- d. Basic concepts of taxonomy
- e. History of Classification

1.2: Trends in biosystematics

- a. Chemotaxonomy
- b. Cytotoxonomy
- c. Molecular taxonomy

1.3: Dimensions of speciation.

Species concepts: Typological, Nominalist and Biological Species concepts.

Unit 2- : Protista and Metazoa

(15 lectures)

Learning objectives:

To comprehend the general characters and classification of Kingdom Animalia from Protista and Metazoa and specific characters of organisms.

Desired outcome:

The learners will be familiarized with classification up to Nematoda and their distinctive features.

2.1 : Protozoa

- General characteristics and Classification up to phylum (according to Levine et. al., 1980)
- Locomotion in Euglena, Paramecium and Amoeba; Conjugation in Paramecium.
- Life cycle and pathogenicity of Plasmodium vivax and Entamoeba histolytica

2.2 : Metazoa

- Evolution of symmetry and segmentation of Metazoa

2.3 : Porifera

- General characteristics and Classification up to orders (after Hyman, 1951); Canal system and spicules in sponges

2.4 : Cnidaria

- General characteristics and Classification up to orders.
- Metagenesis in Obelia, Polymorphism in Cnidaria
- Corals and coral reef diversity, function & conservation

2.5 : Ctenophora

- General characteristics and classification upto classes

2.6 : Platyhelminthes

- General characteristics and Classification up to classes

2.7 : Nematoda

- General characteristics and Classification up to classes

Unit3: Non- Chordates

(15 lectures)

Learning objectives:

To introduce basic concepts of classification up to class in animal kingdom from phylum Annelida to Hemichordata and to familiarize with their characters.

Desired outcome:

Learners will get an idea of higher groups of invertebrate animal life, their classification and their peculiar aspects.

3.1 : Introduction

- Evolution of coelom and metamerism

3.2 : Annelida

- General characteristics and Classification up to order
- Excretion in Annelida through nephridia.

3.3 : Arthropoda

- General characteristics and Classification up to subclass
- Vision in Insecta
- Respiration in Arthropoda (Gills in prawn and trachea in cockroach)
- Metamorphosis in Lepidopteran Insects.
- Social life in termite

3.4 : Onychophora

- General characteristics and Evolutionary significance

3.5 : Mollusca

- General characteristics and Classification up to classes
- Nervous system and torsion in Gastropoda
- Feeding and respiration in Pila sp.

3.6 : Echinodermata

- General characteristics and Classification up to orders
- Larval forms in Echinodermata
- Affinities with Chordates

3.7 : Hemichordata

- General characteristics of phylum Hemichordata.
- Relationship with non-chordates and chordates

Unit 4: Type study- Earthworm

(15 lectures)

Learning objective-

To acquaint learners with the details of earthworm as a representative of invertebrate animals.

Desired outcome-

Learners will get an idea of general characteristics and details of invertebrate animal systems.

4.1: General characters and classification, Habit and habitat, External characters, metamerism, locomotion, economic importance.

4.2: Digestive system, Respiratory system, Circulatory system, excretory system, nervous system, and Reproductive system.

T.Y.B.Sc. Semester V (Practical)

Course Code: USC5Z01

Core Course 11

1. Identification of *Amoeba*, *Euglena*, *Entamoeba*, *Opalina*, *Paramecium*, *Plasmodium vivax* and *Plasmodium falciparum* (from the prepared slides)
2. Identification of *Sycon*, *Obelia*, *Physalia*, *Millepora*, *Aurelia*, *Tubipora*, *Corallium*, *Alcyonium*, *Gorgonia*, *Metridium*, *Pennatula*, *Fungia*, *Meandrina*, *Madrepora*
3. Identification and significance of adult *Fasciola hepatica*, *Taenia solium* and *Ascaris lumbricoides*.
4. Staining/mounting of any protozoa/helminth from gut of cockroach.
5. Identification of following specimens (based on specimen characters):
 - a. Annelids- *Nereis*, *Heteronereis*, *Sabella*, *Chaetopterus*, *Pheretima*, *Hirudinaria*
 - b. Arthropods- *Palamnaeus*, *Palaemon*, *Daphnia*, *Balanus*, *Sacculina*, *Eupagurus*, *Scolopendra*, *Julus*, *Bombyx*, *Periplaneta*, *Odontotermes* and *Apis*
 - c. Onychophora- *Peripatus*
 - d. Molluscs –*Chiton*, *Dentalium*, *Pila*, *Doris*, *Helix*, *Lamellidens*, *Ostrea*, *Pinctada*, *Sepia*, *Octopus*, *Nautilus*
 - e. Echinoderms- *Asterias*, *Ophiura*, *Clypeaster*, *Echinus*, *Cucumaria* and *Antedon*
 - f. Hemichordates – *Balanoglossus*
7. Study of digestive system, septal nephridia and pharyngeal nephridia of earthworm using model and chart.
8. Study of T.S. through pharynx, gizzard, and intestine at typhlosolar region of earthworm
9. Study of mouth parts and study of digestive system and nervous system of *Periplaneta*.
10. To submit a Project Report on any related topic on larval forms (arthropods, mollusca and Echinodermata).

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Syllabus for T.Y.B.Sc.

Program B.Sc.

Course: ZOOLOGY

Semester V Paper II and Practical II

T.Y.B.Sc. Zoology Semester V (Theory)

Course Code: USC5Z02

Core Course 12

Haematology and Immunology

Course objective:

Demonstrate an understanding of the components of human blood with their characteristics, functions, abnormalities and related diseases and also to identify the major cellular and tissue components which comprise the innate and adaptive immune system.

Course Outcome:

Learners can achieve proficiency in the skills necessary for the study of haematology and can identify the major cellular and tissue components which comprise the innate and adaptive immune system.

Unit I: Basic Haematology

(15 Lectures)

Learning objectives:

To introduce to the learner the composition of blood, haemorrhage and haematopoiesis and to acquaint the learner with the physiology of blood clotting and clinical aspects of haematology,

Desired outcome:

- *Learner shall be familiar with the fundamental concepts in haematology.*
- *Learner shall comprehend basic haematology.*
- *Learner will be able to identify various components of haemostatic systems.*

1.1 : Composition of blood plasma

Water, plasma proteins, inorganic constituents, respiratory gases, organic constituents other than protein (include internal secretions, antibodies and enzymes)

1.2 : Erythrocytes

Structure and functions, abnormalities in structure, total count, variation in number; ESR; types of anaemia

1.3 : Hemoglobin

Structure, formation and degradation; variants of hemoglobin (fetal, adult), abnormalities in Hemoglobin (Sickle cell and Thalassemia)

1.4 : Leucocytes

Types of leucocytes and function, total count and variation in number; leukemia and its types

1.5 : Thrombocytes

Structure of thrombocytes, factors and mechanism of clotting, failure of clotting mechanism

1.6 : Haematopoiesis

Erythropoiesis, leucopoiesis and thrombopoiesis

1.7 : Blood volume

Total quantity and regulation; hemorrhage

Unit II: Applied Haematology

(15 Lectures)

Learning Objective

- *To introduce to the learner the basics of applied hematology and to impart knowledge of basic diagnostic techniques used in pathology.*

Desired outcome:

- *Learners shall get familiar with different terminologies and diagnostic tests performed in a pathological laboratory.*
- *Learners will be acquainted with diagnostic approaches in haematological disorders*
- *Learners will be better equipped for taking any further pathological course or working in a diagnostic laboratory.*

2.1 : Introduction to Applied Haematology

Scope and brief introduction of basic branches: clinical, microbiological, oncological and forensic hematology

2.2 : Diagnostic techniques used in haematology

2.2.1 : Microscopic examination of blood: For detection of blood cancers (lymphoma, myeloma), infectious diseases (malaria, leishmaniasis), hemoglobinopathies (sickle cell, thalassemia)

2.2.2 : Coagulopathies: Diagnostic methods (hemophilia and purpura)

2.2.3 : Microbiological examination: Blood culture: Method and application in diagnosis of infectious diseases (Typhoid and TB)

2.2.4 : Biochemical examination of blood:

- Liver function tests: AST, ALT, Total bilirubin, Direct bilirubin, LDH and Alkaline phosphatase
- Kidney function tests: Serum creatinine, blood urea nitrogen (BUN) Carbohydrate metabolism tests: Blood sugar, Glucose tolerance test, Glycosylated haemoglobin test
- Other biochemical tests: Blood hormones - TSH, FSH, LH.

2.2.5 : Blood Bank: Collection, storage & preservation of blood components, anticoagulants

Unit III: Basic Immunology

(15 Lectures)

Learning Objective:

- *To introduce the topic of immunology by emphasizing the basic concepts to build a strong foundation and to give an overview of the immune system that plays an important role in disease resistance.*

Desired outcome:

- *Learners would comprehend the types of immunity and the components of immune system.*
- *Learners would realize the significant role of immune system in giving resistance against diseases.*

3.1 : Overview of Immunology

Haematopoiesis, Cells and organs of the Immune system

3.2 : Innate and Adaptive Immunity

Anatomical barriers, Inflammation, Cell and molecules involved in innate immunity, Adaptive immunity (Cell mediated and humoral), Passive: Artificial and natural Immunity, Active: Artificial and natural Immunity, Immune dysfunctions.

3.3 : Antigens

Antigenicity and immunogenicity, Immunogens, Adjuvants and haptens, Factors influencing immunogenicity, B and T-Cell epitopes Definition, properties of antigens; haptens

3.4 : Immunoglobulins

Structure and functions of different classes of immunoglobulins, Antigen-antibody interactions, Immunoassays, Polyclonal sera, Monoclonal antibodies, Hybridoma

technology 3.5: **Major Histocompatibility Complex (MHC)**

Types and Pathways

Unit IV: Applied Immunology

(15 Lectures)

Learning Objective:

- *To introduce to the learner immune related pathologies*
- *To introduce the concept of vaccines and vaccination.*
- *To familiarise the learner to immunological perspectives of organ transplant and tumour treatment.*

Desired outcome:

- *Learners shall understand immune related pathologies and the principles and applications of vaccines.*
- *Learners will develop basic understanding of immunology of organ transplantation.*

4.1 : Antigen-Antibody interaction

4.1.1 : General features of antigen-antibody interaction

4.1.2 : Precipitation reaction- Definition, characteristics and mechanism, Precipitation in gels (slide test), Radial immunodiffusion (Mancini method), Double immunodiffusion (Ouchterlony method)

4.1.3 : Immuno-electrophoresis - Counter current, Laurel's Rocket and crossed immuno-electrophoresis

4.1.4 : Agglutination reaction- definition, characteristics and mechanism Haemagglutination (slide and micro-tray agglutination), passive agglutination, Coomb's test

4.1.5 : Immunoassay- ELISA

4.2 : Vaccines and Vaccination

4.2.1 : Brief history of vaccination, principles of vaccines-active and passive immunization, Routes of vaccine administration

4.2.2 : Classification of vaccines: Live attenuated; Whole-Killed or inactivated; Sub-unit vaccines: Toxoids, Protein vaccines, Viral-like particles, DNA vaccines

4.2.3 : Adjuvants used for human vaccines – Virosomes and Liposomes, Saponins, Water- in-oil emulsions.

4.2.4 : Vaccines against human pathogens: Polio; Hepatitis A and B; Tuberculosis (BCG)

4.3 : Transplantation Immunology

Introduction to transplantation; Types of grafts; Immunologic basis of graft rejection;

Precautions against graft rejection

4.4: Auto immune and immunodeficiency disorder

4.4.1: Anaphylaxis,

4.4.2: Auto immune disorders

System specific (Systemic lupus erythematosus, Rheumatoid arthritis) and Organ specific (Grave's Disorder),

4.4.3: Immunodeficiency disorder -Primary (SCID) Secondary (AIDS).

T.Y.B.Sc. Practical (Semester V)

Course codes: USC5ZOP2

Core Course 12

1. ABO blood group determination
2. Preparation of a Peripheral Blood Smear
3. Enumeration of Erythrocytes – Total Count.
4. Enumeration of Leucocytes – Total Count.
5. Differential count of Leucocytes
6. Erythrocyte Sedimentation Rate by suitable method– Westergren or Wintrobe method.
7. Estimation of haemoglobin by Sahli’s acid haematin method.
8. Determination of serum LDH.
9. Estimation of total serum/ plasma proteins by Folin’s method.
10. Estimation of serum/ plasma total triglycerides by Phosphovanillin method.
11. Latex agglutination test – Rheumatoid Arthritis.

Reference and Additional Reading

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6. Rapid Review of Hematology; RamadasNayak; Jaypee Brothers
7. Precise Haematology; UshaRusia, MeeraSikka, RenuSaxena; Wiley India
8. Short Textbook of Haematology; Shah B.S.; C.B.S. Publisher and Distributor
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5. Textbook of Immunology; Haleem Khan, Rajendra Sagar, Sadguna
6. Prescott's Microbiology; Ninth Edition; Joanne M. Willey, Linda M. Sherwood & Christopher J. Woolverton; McGraw-Hill Education; 2014
7. Immunology; Third Edition; Janis Kuby; W.H. Freeman; 1997
8. Kuby Immunology; Sixth Edition; Thomas J. Kindt, Richard A. Goldsby, Barbara A. Osborne & Janis Kuby; W.H. Freeman; 2007
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2. Roitt's Essential Immunology – Vol. 20; Delves P. J., Martin S. J., Burton D. R., & Roitt I. M.; John Wiley & Sons; 2011
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Syllabus for T.Y.B.Sc.

Program B.Sc.

Course: ZOOLOGY

Semester V

Paper III and Practical III

T.Y.B.Sc. Zoology Semester V (Theory) Course

Code: USC5Z03

Core Course 13

Histology, Toxicology, Enzymology and Biostatistics

Course objectives:

- *To introduce the learners with the basic concepts of enzymology and enzyme kinetics, principles of toxicology and obtain knowledge and practical skills in the toxicology.*
- *To make the learners to understand the principal concepts of biostatistics, collect data relating to variable/variables, which can be examined and descriptive statistics can be calculated from these data.*

Course outcome:

- *The students can learn about various aspects of enzymological assays and their applications in industries and study of basics histological techniques, a broad understanding of different areas of toxicology.*

Unit I: Histology

(15 Lectures)

Learning Objectives:

- *To familiarize the learners with the cellular architecture of the various organs in the body.*
- *To make the learners understand the need and importance of different types of tissues in the vital organs and their functions.*

Desired outcome:

- *Learners would appreciate the well-planned organization of tissues and cells in the organ systems.*

1.1 : Vertical section (V.S.) of skin

Layers and cells of epidermis; papillary and reticular; layers of dermis; sweat glands, sebaceous glands and skin receptors.

1.2 : Digestive System

1.2.1 : Vertical section (V.S.) of tooth – hard tissue – dentine and enamel, soft tissue – dentinal pulp and periodontal ligaments.

1.2.2 : Transverse section (T.S.) of tongue – mucosal papillae and taste buds

1.2.3 : Alimentary canal – Transverse section (T.S.) of stomach, small intestine, large intestine of mammal.

1.2.4 : Glands associated with digestive system - Transverse section (T.S.) of salivary glands, liver.

Unit II: Toxicology

(15 Lectures)

Learning Objective:

- *To introduce the learners to the principles of toxicology with particular emphasis on toxic responses to chemical exposures, nature and effect of toxicity and toxicity testing.*
- *It also intends to develop amongst students an introductory understanding of regulatory affairs in toxicology.*

Desired outcome:

- *The course will prepare learners to develop broad understanding of the different areas of toxicology.*
- *It will also develop critical thinking and assist students in preparation for employment in pharmaceutical industry and related areas.*

2.1 : Basic toxicology

2.1.1 : Introduction to toxicology – brief history, different areas of toxicology, principles and scope of toxicology

2.1.2 : Toxins and Toxicants – Phytotoxins (caffeine, nicotine), Mycotoxins (aflatoxins), Zootoxins (cnidarian toxin, bee venom, scorpion venom, snake venom).

2.1.3 : Characteristics of Exposure – Duration of exposure, Frequency of exposure, Site of exposure and Routes of exposure.

2.1.4 : Types of toxicity – Acute toxicity, subacute toxicity, sub chronic toxicity and chronic toxicity.

2.1.5 : Concept of LD₅₀, LC₅₀, ED₅₀

2.1.6 : Dose Response relationship – Individual/ Graded dose response, Quantal dose response, shape of dose response curves, Therapeutic index, Margin of safety.

2.1.7 : Dose translation from animals to human – Concept of extrapolation of dose, NOAEL (No Observed Adverse Effect Level), Safety factor, ADI (Acceptable Daily Intake).

2.2 : Regulatory toxicology

2.2.1 : OECD guidelines for testing of chemicals (an overview)

2.2.2 : CPCSEA guidelines for animal testing center, ethical issues in animal studies

2.2.3 : Animal models used in regulatory toxicology studies

2.2.4 : Alternative methods in toxicology (*in vitro* tests)

Unit III: Enzymology

(15 Lectures)

Learning Objective:

- *To introduce to the learner the basic concepts of enzyme biochemistry and to make the learner realize the power and application of enzymes in basic and applied science.*

Desired outcome:

- *Learners shall be able to understand basics of enzyme structure and function.*
- *Learners will be able to comprehend variations in enzyme activity and kinetics.*
- *Learners shall appreciate the enzyme assay procedures and the therapeutic application of enzymes.*

3.1: Introduction and Nomenclature

Definition; Concept of activation energy; Nomenclature and classification (based on enzyme Commission) of enzymes; Co-factors and Co-enzymes.

3.2: Enzyme Action

Mechanism of enzyme action; Factors affecting enzyme activity - pH and temperature; Enzyme structure (lysozyme and serine protease) .

3.3: Enzyme kinetics

Derivation of Michaelis-Menten equation and Lineweaver-Burk plot; Concept and significance of K_m , V_{max} and K_{cat} ; Modulation of enzyme activity with reference to GDH.

3.4: Enzyme inhibition

Enzyme inhibitors, competitive and non-competitive inhibitors and their kinetics; therapeutic applications of enzyme inhibitors.

3.5: Regulation of enzyme activity

Allosteric regulation and regulation by covalent modification of enzymes; Isozymes (LDH)

3.6: Applications

Clinical significance and industrial applications of enzymes.

Unit IV: Biostatistics

Learning Objective:

- *To make learners familiar with biostatistics as an important tool of analysis and its applications.*

Desired outcome:

- *The learners will be able to collect, organize and analyze data using parametric and non-parametric tests.*
- *They will also be able to set up a hypothesis and verify the same using limits of significance.*

4.1 : Probability Distributions

Normal, Binomial, Poisson distribution, Z-transformation, p-value, Probability - Addition and multiplication rules and their applications.

4.2 : Measures of Central Tendency and Dispersion

Variance, standard deviation, standard error.

4.3 : Testing of Hypothesis

Basic concepts, types of hypothesis: Null hypothesis and Alternate hypothesis. Levels of significance and testing of hypothesis.

4.4 : Parametric and non-parametric tests

Parametric tests: two-tailed Z-test and t-test.

Non-parametric test: Chi-square test and its applications.

4.5 : Correlation

Correlation coefficient and its significance

T.Y.B.Sc. Semester V (Practical3)

Course Code: USC5ZOP3

Core Course 13

1. Study of mammalian tissues:
 - i. V.S. of Tooth
 - ii. T.S. of Stomach
 - iii. T.S. of small intestine
 - iv. T.S. of Liver
2. Microtomy: Tissue preservation and fixation, dehydration, infiltration, paraffin embedding and block preparation, sectioning, staining.
3. To study the effect of different pH on activity of salivary content (salivary amylase) on starch.
4. To study the effect of different temperature on activity of salivary content (salivary amylase) on starch.
5. Effect of varying pH on activity of enzyme Acid Phosphatase.
6. Effect of varying enzyme concentration on activity of enzyme Acid Phosphatase
7. Effect of varying substrate concentration on activity of enzyme Acid Phosphatase
8. Effect of inhibitor on the activity of enzyme Acid Phosphatase
9. Separation of LDH isozymes by agarose gel electrophoresis
10. Biostatistics- Any 10-example based on theory
11. **Project** (preparation of slides of any suitable tissue). Slides and Report of the same to be submitted at the time of practical examination.

Reference and Additional Reading

Histology

1. A Textbook of Histology; Deshmukh Shivaji; Dominant Pub.
2. Colour Textbook of Histology; Gartner, Leslie P.; Saunders.
3. A Textbook of Histology; Mathur Ramesh; Anmol Pub.
4. A Textbook of Histology and A Practical Guide; Gunasegaran J.P.; Elsevier
5. A Textbook of Histology; Khanna D.R.; Sonali Pub.
6. Practical Zoology; Second Edition; Dr. K.C. Ghose & Dr. B. Manna; New Central Book Agency Pvt. Ltd. , Kolkata; 1999.

Toxicology

1. Casarett and Doulls Toxicology – The basic science of poisons; Edited by Curtis Klaassen; McGraw-Hill; 2001.
2. Toxicological testing handbook – Principles, applications and data interpretation; David Jacobson-Kram and Kit Keller; CRC Press; 2006
3. Principles and methods of toxicology; A. Wallace Hayes; CRC Press; 2007
4. Toxicology – principles and methods; M.A. Subramanian; MJP Publishers, Chennai; 2004
5. Fundamentals of Toxicology; Kamleshwar Pandey and JP Shukla; New Central book agency Ltd., Kolkata; 2011
6. Elements of Toxicology; Kamleshwar Pandey and JP Shukla; Wisdom Press, New Delhi; 2010
7. Principles and Applications of Toxicology; Lahir Y.K.; Seekay Publications; 2013
8. Essentials of Clinical Toxicology; Lall S.; Narosa Publishing House; 1998

Enzymology

1. Lehninger's Principles of Biochemistry; David Lee Nelson, A.L. Lehninger, Michael M Cox; W.H. Freeman, New York; 2008
2. Biochemistry; 5th ed.; J M Berg, J L Tymoczko and Lubert Stryer ; W.H. Freeman, New York; 2002
3. Biochemistry; 2nd edition; Donald Voet and Judith G Voet; J. Wiley and Sons, New York; 1995

4. Textbook of Biochemistry with clinical correlations; Fourth Edition: Edited by Thomas M.Devlin; Wiley-Liss Publication.
5. Biochemistry; Third Edition: Pamela C. Champe, Richard A. Harvey, Denise R. Ferrier; Indian Edition by JP Publication.
6. A textbook of Enzymes: Shailendra Singh; Campus Book International, New Delhi 2007.

Biostatistics

1. Biostatistics – The Bare Essentials; Third Edition; Geoffrey R. Norman, David L. Streiner; B.C. Decker, Inc., Hamilton; 2008
2. Fundamentals of Biostatistics; Second Edition; Veer BalaRastogi; Ane Books Pvt. Ltd., New Delhi; 2009 (Reprint 2010)
3. Fundamentals of Biostatistics; Second Revised Edition; Irfan Ali Khan and AtiyaKhanum; Ukaaz Publications, Hyderabad; 2004
4. Instant Medical Biostatistics; Dr. Ranjan Das and Dr.Papri N. Das; Ane Books Pvt. Ltd., New Delhi; 2009
5. Primer of Biostatistics; Fifth Edition; Stanton A. Glantz; McGraw-Hill Companies, Inc.; 2002
6. Basic Biostatistics – Statistics for Public Health Practice; Second Edition; B. Burt Gerstman; Jones and Bartlett Learning Burlington; 2015
7. Biostatistics – A Guide to Design, Analysis, and Discovery; Second Edition; Ronald N. Forthofer, EunSul Lee and Mike Hernandez; Elsevier, Inc., (Academic Press), USA; 2007
8. Statistics in Biology and Psychology; Sixth Edition; Debajyoti Das and Arati Das; Academic Publishers, Kolkata

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Program B.Sc.

Course: ZOOLOGY

Semester V

Paper IV and Practical IV

T.Y.B.Sc. Semester V (Theory)

Course Code: USC5Z04

Discipline Specific Elective 14

Integumentary system, Human Osteology and Endocrinology

Course Objectives:

To introduce the learners to different integumentary structures, epidermal derivatives in the vertebrates and also to elaborate on structure, functions and regulation of mammalian endocrine glands.

Course outcome:

Learners can understand the basic concepts of Integumentary system, Human osteology and Endocrinology.

Unit 1: Integumentary system and derivatives

(15 Lectures)

Learning Objective:

- *To introduce the learners to understand different integumentary structures and derivatives in the vertebrates and to acquaint learners with special derivatives of integument.*

Desired outcome:

- *Learners will be able to understand the importance of epidermal and dermal derivatives and their functions.*

1.1 : Basic structure of integument

Epidermis and dermis

1.2 : Epidermal derivatives of Vertebrates

Hair, hoof, horn, claw, teeth, beak, epidermal scales (large scales, small scales, modified scales - spine), glands - types and functions (mucous, serous, ceruminous, poison, uropygial, salt), type of feathers.

1.3 : Dermal derivatives of Vertebrates

Scales in fish; Scutes in reptiles and birds; Dermal scales in mammals- Armadillo, Antler -Caribou

1.4 : Special derivatives of integument

Wart in toad, rattle in snake, whale bone in baleen whale, kneepads in camel.

Unit 2: Human Osteology

(15 Lectures)

Learning Objective:

To introduce the learners to different bones of human skeleton and their importance.

Desired outcome:

Learners will be able to understand the structure, types and functions of human skeleton.

2.1 : Introduction

Bone structure, physical properties, chemical composition and functions of bones.

2.2 : Axial skeleton

2.2.1 : Skull:

General characteristics of skull bones a) Cranial bones b) Facial bones

2.2.2 : Vertebral column:

General characteristics of a vertebra, structure of different types of vertebrae (cervical, thoracic, lumbar, sacrum & coccyx).

2.2.3 : Ribs and sternum (Thorax): General skeleton of ribs and sternum.

2.2.4 : Hyoid bone: Structure and function.

2.3 : Appendicular skeleton

2.3.1 : Pectoral girdle and Pelvic girdle in male and female.

2.3.2 : Bones of forelimbs and hind limbs.

Unit 3: Introduction to Endocrinology

(15 Lectures)

Learning Objective:

- *To introduce to the learner the basics of endocrinology.*

Desired outcome:

- *Learners can understand the basic concepts of endocrinology and learn about the hypothalamus and hypophysial axis.*

3.1 : General idea of Endocrine systems

3.2 : Definition and classification of hormones.

3.3 : Mechanism of Hormone action

3.4 : Epiphysis, Hypothalamo-hypophysial Axis

3.5 : Structure and functions of hypothalamus, Regulation of neuroendocrine glands and Feedback mechanisms

3.6: Structure of pituitary gland, Hormones and their functions.

Unit 4: Peripheral Endocrine Glands

(15 Lectures)

Learning Objective:

- *To introduce the learners about the endocrine glands.*

Desired outcome:

- *Learners shall be able to understand the types & secretions of endocrine glands and their functions.*

4.1 : Structure, Hormones, Functions, Regulation and Disorders of the following glands:

Thyroid gland, Parathyroid gland, Adrenal gland, Pancreas, Ovaries and testes.

T.Y.B.Sc. Semester V (Practical)

Course code: USC5ZOP4

Discipline Specific Elective 14

1. Study of integumentary systems and its derivatives - V.S. of Skin of Shark, Frog, *Calotes*, Pigeon and Human.
2. Study of Human Axial Skeleton - Skull and Vertebral column.
3. Study of Human Appendicular Skeleton - Girdles and Limb bones.
4. Study of the skeleton of Rana (Frog), Varanus, Pigeon
5. Histological and cytological study of the following endocrine glands with the help of Permanent slides:
 - A. T.S. of pituitary
 - B. Pineal gland
 - C. Thyroid
 - D. Parathyroid
 - E. Pancreas
 - F. Adrenal
 - G. Ovary
 - H. Testis
6. Histological study of testes and ovaries from various vertebrate groups.
7. Demonstration of endocrine glands in rat by using charts and model.
8. Estimation of plasma level in any hormone using ELISA.

References and Additional Reading Material

Integumentary system and derivatives

1. Comparative Anatomy of the Vertebrates; Ninth Edition; Kent, G.C. and Carr R.K.;
The
2. McGraw-Hill Companies; 2000
3. Text book of chordates; Saras publication
4. Modern text of zoology; Prof. R.L. Kotpal
5. Integumentary system and its derivatives; Samuel D. Hodge

Human Osteology

1. Atlas of human anatomy -Vol I; R.D. Sinelnikov; Mr. Publishers Moscow
2. A Guide of Osteology (for medical students); Prakash kendra, Lucknow
3. Text Book of Comparative Anatomy and Physiology; Tortora
4. Human osteology; Tim DWhite
5. Text Book of Human osteology; Singh Inderbir
6. Mechanisms of Body Functions; Second Edition; Dexter M. Easton; Prentice- Hall
of India Pvt. Ltd., New Delhi; 1978

Endocrinology

1. Barington (1979) Hormones and evolution Vol I&II Academic press, New York.
2. John F- Laycock and Peter H. Wise, Essential of Endocrinology
3. Williams R.H. (1974). Textbook of Endocrinology V.Ed. Saunders Press, London.
4. Endocrinology- Hadley
5. General endocrinology Bagrara and Tumer, W.B. Saunders.
6. The Physiology of Reproduction, Vol I& II E. K .Nobil and JU. D.Neil, Raven Press,
New York, 1988.
7. Benjamin Levin-Gene VII, Oxford University Press.
8. Lodish et al Molecular Cell Biology

Syllabus for T.Y.B.Sc.

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Course: ZOOLOGY

Semester VI

Paper I and Practical I

T.Y.B.Sc. Semester VI (Theory)

Course Code: USC6Z01

Core Course 15

**Phylum Chordata, Group Euchordata- I, Group Euchordata II and
Type study - Shark**

Unit 1: Phylum Chordata

(15 lectures)

Learning objectives:

To introduce basic concepts of modern Chordate classification with evolution point of view and to understand the concept of taxonomy in higher animal kingdom.

Desired outcome:

Learners will get an idea of origin of Chordates, its taxonomy up to class with reference to phylogeny and their special features.

1.1: General characteristics and outline classification of Phylum Chordata

1. 2: Protochordata

1.2.1 :General characteristics and classification of sub-phylum Urochordata and Cephalochordate up to Classes.

1.2.2 : Retrogressive metamorphosis in Ascidia.

1.2.3 : Chordate Features and Feeding in Branchiostoma

Unit 2: Group Euchordata- I

(15 lectures)

2.1 : Division – Gnathostomata

Superclass – Pisces and Tetrapoda

Superclass – Pisces- Distinguishing characters.

Class- Placodermi, Chondrichthyes and Osteichthyes-

Distinguishing characters with examples:

- a. Hammer headed shark
- b. Skates and rays, e.g. Saw fish
- c. Chimeras e.g Spotted rat fish
- d. Flying fish, e.g. Exocoetus

2.2 : Dipnoi (Lung fish) -

Distribution, habit and habitat, External and internal characters, affinities with superclass

Pisces, affinities and differences with class Amphibia

2.3: Migration in fish:

Reasons for migration, types of migration; Examples- Eel and Salmon

2.4: Superclass Tetrapoda-

Class Amphibia -General characters with Examples:

- a. Limb-less amphibian, e.g. Ichthyophis
- b. Tailed amphibian, e.g. Amphiuma
- c. Tail-less amphibian, e.g. Hyla

2.5.: Neoteny and Paedogenesis in Amphibia

Unit 3: Group Euchordata II - Reptilia, Aves and Mammals

(15 Lectures)

Learning objectives:

To introduce the learners to the distinguishing characters of classes Reptilia, Aves and Mammalia and their adaptive features with reference to their habitat.

Learning outcome:

Learners will understand the characteristic features and examples of class of Reptilia, Aves and Mammalia.

3.1 : Class Reptilia:

General characters with examples:

- a. Extinct reptile, e.g. Ichthyosaurus
- b. Living fossil, e.g. Sphenodon
- c. Aquatic reptile, e.g. Chelone
- d. Arboreal reptile, e.g. Chamaeleon

3.2 : Class Aves-

3.2.1. General Characters and Examples

- a. Arboreal bird e.g Wood pecker
- b. Terrestrial bird e.g. Jungle fowl
- c. Swimming bird e.g. Cormorant
- d. Wading bird, e.gs. Pond heron
- e. Birds of prey, e.g. Owl
- f. Flightless birds e.g. Emu

3.2.2: Flight adaptations in birds

3.3 : Class Mammalia

3.3.1 : General characters and examples -

- a. Aquatic mammals, e.g. Dolphin
- b. Egg-laying mammals, e.g. Duck-billed platypus
- c. Pouched mammals, e.g. Kangaroo
- d. Toothless mammals, e.g. Sloth
- e. Gnawing mammals, e.g. Squirrel
- f. Primates, e.g. Lemur

3.3.2: Adaptations in aquatic mammals with examples.

Unit 4: Type study - Shark

(15 lectures)

Learning objectives:

To study in depth one vertebrate animal type i. e. general characteristics and salient features of animal type - shark.

Learning outcome:

Learners will get an idea of vertebrate animal life after studying one representative animal Shark.

4.1 : Habit & habitat, distribution, external characters and classification, and economic importance.

4.2 : Skin, exoskeleton, endoskeleton, Digestive system, respiratory system, blood vascular System, nervous system, receptor organs, urogenital system, copulation, fertilization and development.

T. Y. B. Sc. Semester VI (Practical)

Course Code: USC6Z01

Core Course 15

1. Group - Protochordata

Subphylum Urochordata -

- a. Class Larvaceae, e.g. Oikopleura
- b. Class Ascidiacea, e.g. Ciona
- c. Class Thaliacea, e.g.

Salpa Subphylum

Cephalochordata:

- a. Class Leptocardii, e.g. Branchiostoma (Amphioxus)

2. Subphylum Vertebrata:

i. Division Agnatha

- a. Class Ostracodermi, e.g. Pharyngolepis,
- b. Class Cyclostomata, e.g. Petromyzon

ii. Division- Gnathostomata

Superclass - Pisces:

- a. Class Placodermi e.g. Bothriolepis
- b. Class Chondrichthyes- e.g. Rhinobates . Chimaera
- c. Class- Osteichthyes -e.g. Protopterus , Catfish

Superclass - Tetrapoda :

- a. Class Amphibia, e.g. Ichthyophis, Alytes, Triton
- b. Class Reptilia: e.g. Geochelone (Indian star tortoise) ,Sphenodon ,Varanus, Alligator

3. Class Aves:

E.g. Archaeopteryx, Ostrich, Penguin, Flamingo, Vulture, Hornbill

4. Class Mammalia

E.g. Duck-billed platypus, Dasyurus (Tiger cat), Dugong, Flying Squirrel, Gorilla.

5. Shark: Study of endoskeleton of shark:

- a. Axial- skull and vertebral column
- b. Appendicular- pelvic and pectoral fins, pelvic and pectoral girdle.

6. Visit to local fish market/Aquarium/ zoo/ National park/Any other relevant place

to observe Chordate animals.

References and Additional Readings

1. Modern text book of Zoology – Vertebrates; Professor R.L. Kotpal;
Rastogi publication; Third Edition 2012
2. Vertebrate Zoology for Degree students; V. K. Agarwal; S.Chand Publication; 2012
3. Fundamentals of Zoology, Dr. K.C. Ghosh and Dr. B. Manna, New Central
book Agency (P) Ltd.
4. Chordate Zoology Volume II, Prof. N. Arumogam. Saras Publication.
5. Chordate Anatomy Mohan P. Arora, Himalaya Publishing House, First edition
6. Chordate Zoology, E.L.Jordan, P.S. Verma, S. Chand & Company Ltd.
7. The life of Vertebrates; J.Z. Young; ELBS - Oxford University Press
Third edition, 2006
8. Textbook of chordate Zoology, Vol. II, G.S. Sandhu, H. Bhaskar
Campus Book International, First edition, 2005

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Course: ZOOLOGY

Semester VI

Paper II and Practical II

T. Y. B. Sc. Semester VI (Theory)

Course Code: USC6Z02

Core Course 16

**Molecular Biology, Genetic Engineering,
Human Genetics and Bioinformatics**

Unit I: Molecular Biology

(15 Lectures)

Learning Objectives:

- *To introduce learner to chemical and molecular processes that affect genetic material.*
- *To make learner understand the concept of DNA damage and repair, and how gene control is necessary for cell survival.*

Desired outcome:

- *Learner shall get an insight into the intricacies of chemical and molecular processes that affect genetic material.*
- *The course shall prepare learner to recognize the significance of molecular biology as a basis for the study of other areas of biology and biochemistry.*
- *Learner shall also understand related areas in relatively new fields of genetic engineering and biotechnology.*

1.1 : Types of mutation

1.1.1 : Point mutations – substitution, deletion and insertion mutations

Substitution mutations – silent (same-sense), missense and nonsense mutations, transition and transversion

Deletion and Insertion mutations – frameshift mutations

1.1.2: Trinucleotide repeat expansions – fragile X syndrome, Huntington disease

1.1.3: Spontaneous mutation – tautomeric shifts, spontaneous lesions

1.2: Induced mutations/mutagens/mutagenic agents/Nucleic acid damage

1.2.1: Physical agents:

Ionizing radiation (X-rays, α , β and γ rays)

Non-ionizing radiation (UV light)

1.2.2: Chemical agents:

Base analogs (5-bromouracil)

Intercalating agents (ethidium bromide)

Deaminating agents (nitrous acid)

Hydroxylating agents (hydroxylamine)

Alkylating agents (mustard gas)

Aflatoxin (aflatoxin B1)

1.2 : Preventative and repair mechanisms for DNA damage

1.2.1 : Mechanisms that prevent DNA damage – superoxide dismutase and catalase

1.2.2 : Mechanisms that repair damaged DNA – direct DNA repair (alkyl transferases, photoreactivation, excision repair)

1.2.3 : Postreplication repair – recombination repair, mismatch repair, SOS repair

1.3 : Eukaryotic gene expression

1.3.1 : Regulatory protein **domains**– zinc fingers, helix-turn-helix domain and leucine zipper

1.3.2 : DNA methylation

Unit II: Genetic Engineering

(15 Lectures)

Learning Objective:

- *To introduce learner to a set of techniques to modify an organism's genome to produce improved or novel genes and organisms.*

Desired outcome:

- *The learners shall get acquainted with the vast array of techniques used to manipulate genes which can be applied in numerous fields like medicine, research, etc. for human benefit.*

2.1 : Tools in Genetic Engineering

2.1.1 : Enzymes involved in Genetic Engineering:

Introduction, nomenclature and types of restriction enzymes with examples, Ligases– *E. coli* DNA ligase, T4 DNA ligase, polynucleotide kinase, phosphatases, DNA polymerases, reverse transcriptase, terminal transferase

2.1.2 : Vectors for gene cloning: General properties, advantages and disadvantages of cloning vectors - plasmid vectors(pBR322), phage vectors (λ Phage), cosmid vectors (c2XB),

2.1.3 : **Cloning techniques:** Cloning after restriction digestion - blunt and cohesive end ligation, creation of restriction sites using linkers and adapters, cloning after homopolymer tailing, cDNA synthesis (Reverse transcription), genomic and cDNA libraries

2.2 : Techniques in Genetic Engineering

2.2.1 : **PCR techniques:** Principle of polymerase chain reaction (PCR), Applications of PCR

2.2.2 : **Sequencing techniques:** DNA sequencing: Maxam-Gilbert method, Sanger's Dideoxy method, Recent high throughput method, Protein sequencing: Edman's method Applications of sequencing techniques

2.2.3 : **Animal Cell culture**

Unit III: Human Genetics

(15 Lectures)

Learning Objectives:

- *To introduce learner with genetic alterations in human genome and their diagnosis.*

Desired outcome:

- *The learners shall become aware of the impact of changes occurring at gene level on human health and its diagnosis.*

3.1 : Non-disjunction during mitosis and meiosis

3.1.1 : **Chromosomal Aberrations:** Structural: Deletion: types, effects and disorders; Translocation: types: Robertsonian and non-Robertsonian, disorders; Inversion: types, effects and significance; Duplication and their evolutionary significance (multigene families)
Numerical: Aneuploidy and Polyploidy (Autopolyploidy and Allopolyploidy)

3.2 : Genetic Disorders

3.2.1 : Inborn Errors of Metabolism: Phenylketonuria, G-6-PD deficiency, Alkaptonuria, Albinism

3.2.2 : Single gene mutation: Cystic fibrosis

3.2.3 : Multifactorial: Breast Cancer

3.2.4 : Uniparental Disomy: Angelman Syndrome and Prader-Willi Syndrome

3.3 : Diagnosis

3.3.1 : Prenatal Diagnosis (Amniocentesis) and chorio-villus sampling, Banding techniques (G, C, Q), FISH, Protein truncation test (PTT),

3.3.2 : Genetic counselling: Psycho-social aspects for the individual and the family in connection with genetic investigations

Unit IV: Bioinformatics

(15 Lectures)

Objectives:

- *To introduce learner to bioinformatics – a computational approach to learning the structure and organization of genomes, phylogeny, metabolism and immunology.*

Desired outcome:

- *Learner shall become aware of the computational point of view of studying the genomes.*

4.1 : Introduction

4.1.1 : Introduction to Bioinformatics and Bioinformatics web resource (NCBI, EBI, OMIM, PubMed)

4.1.2 : Applications of Bioinformatics

4.2 : Databases – Tools and their uses

4.2.1 : Biological databases (With reference to Zoological Databases):

4.2.2 : Primary sequence databases:

Nucleic acid sequence databases (GenBank, EMBL-EBI, DDBJ) Protein sequence data bases (UniProtKB, PIR, PDB)

4.2.3 : Secondary sequence databases:

Derived databases - PROSITE, BLOCKS, Structure databases and bibliographic databases

4.3 : Sequence alignment methods

4.3.1 : BLAST, FASTA

4.3.2 : Types of sequence alignment (Pairwise & Multiple sequence alignment)

4.3.3 : Significance of sequence alignment

4.3.4 : Predictive applications using DNA and protein sequences: Evolutionary studies: Concept of phylogenetic trees convergent and parallel evolution

4.3.5 : Functional Proteomics: Different types of protein chip (detecting and quantifying), applications of Proteomics

4.3.6 : Metabolomics: Concept and applications

4.4. : Predictive applications using DNA and protein sequences (5 L)

4.4.1: Evolutionary studies: Concept of phylogenetic trees convergent and parallel evolution

4.4.2: Functional Proteomics: Different types of protein chip (detecting and quantifying), applications of Proteomics

4.4.3: Metabolomics: Concept and applications

T. Y. B. Sc. Semester VI (Practical)

Course Code: USC6Z02

Core Course 16

1. Isolation & Estimation of RNA by Orcinol method.
2. Isolation & Estimation of DNA by Diphenylamine method.
3. Separation of Genomic DNA by Agarose gel electrophoresis.
4. Colorimetric estimation of proteins from given sample by Bradford's method.
5. Problems related to Restriction endonucleases.
6. Karyotype (Idiogram) analysis for the following syndromes with comments on numerical & structural variations in chromosomes (no cutting of chromosomes):
 - a. Turner's syndrome
 - b. Klinefelter's syndrome
 - c. Down's syndrome
 - d. Cri-du-chat syndrome
 - e. D-G translocation
 - f. Edward's syndrome
 - g. Patau's syndrome
7. Packaging of glassware for tissue culture.
8. Aseptic transfer techniques.
9. Calculation of mitotic index from the photograph or stained preparation of onion root tip or cancer cells.
10. Exploring BLAST tool (nucleotide sequence comparison).
11. Exploring the integrated database system at NCBI server and querying (Querying a nucleotide sequence, querying a protein sequence, use of operators (AND, OR & NOT)).
12. Exploring bibliographic database PubMed (Data Mining-Downloading a research paper on subject of interest, use of operators (AND, OR & NOT)).

References and Additional Readings

Molecular Biology

1. Genetics – The continuity of life; Daniel Fairbanks and Ralph Andersen; Brooks/ Cole Publishing Company; 1999
2. Introduction to Molecular Biology; Peter Paoella; Tata McGraw Hill; 2010
3. Molecular Biology; David Freifelder; Narosa Publishing House; 2008
4. Genetics; Robert Weaver and Philip Hedrick; McGraw Hill; 2001
5. iGenetics – A Molecular Approach; Third Edition; Peter J. Russell; Pearson Education, Inc. (Benjamin Cummings), San Francisco; 2010
6. Molecular Biology – Academic Cell Update; Update Edition; David Clark; Elsevier, Inc.; 2010
7. Genetics; M.W. Farnsworth; Harper and Row Publishers, Inc., USA; 1978
8. Principles of Genetics; Eighth Edition; Gardner, Simmons and Snustad; John Wiley and Sons (Asia) Pte. Ltd., Singapore; 2002
9. The Science of Genetics – An Introduction to Heredity; Fourth Edition; George W. Burns; Macmillan Publishing Co., Inc., New York; 1980
10. Molecular Biology – Bios Instant Notes; Fourth Edition; Alexander McLennan, Andy Bates, Phil Turner & Mike White; Garland Science; 2013
11. <https://www.ncbi.nlm.nih.gov/books/>

Genetic Engineering

1. Current Protocols in Molecular Biology; Frederick M. Ausubel, Roger Brent, Robert E. Kingston, David D. Moore, Seidman J. G., John A. Smith and Kevin Struhl; John Wiley& Son, Inc.; 2003
2. Introduction to Proteomics; Daniel C. Liebler; Humana Press; 2002
3. Molecular cloning; Joseph Sambrook, David William Russell; Third Edition; CSHL Press; 2001
4. Gene Cloning – An Introduction; Brown .T.A; Fourth Edition; Wiley-Blackwell; 2011
5. Recombinant DNA - Genes and Genomes- A short course; 3rd Edition; Watson, J.D., Myers, R.M., Caudy A., Witkowski, J.K.; Freeman and Co. NY; 2007
6. Principles Of Gene Manipulation & Genomics; Primrose SB and R. Twyman; Blackwell

7. Methods In Enzymology, Vol 152; Berger SI, Kimmer AR; Academic Press; 1987
8. Genomes 3; Third Edition; T.A.Brown; Garland Science Publishing; 2007
9. Molecular Biotechnology - Principles and applications of recombinant DNA; Glick, B.R. and Pasternak, J. J.; ASM press, Washington; 2010
10. Microbiology; Fifth Edition; Pelczar, M.J. et al; Tata McGraw-Hill Co., New Delhi; 2001
11. Introduction to Protein Structure; Second Edition; Branden C. and Tooze J.; Garland Publishing; 1999
12. Proteins; Second Edition; Creighton T.E.; W.H. Freeman; 1993
13. Proteomics - Protein Sequence to Function; Pennington, S.R and M.J. Dunn; Viva Books; 2002
14. Genetic engineering – Principles and Practice; Sandhya Mitra; Macmillan India Ltd., New Delhi
15. Biotechnology – Fundamentals and Applications; Third Enlarged Edition; S.S. Purohit; Student Edition, Jodhpur; 2005
16. Biotechnology – Expanding Horizons; B.D.Singh; Kalyani Publishers, Ludhiana
17. A textbook of Biotechnology; R.C.Dubey; S.Chand and Company Ltd., New Delhi
18. Molecular Biology – Bios Instant Notes; Fourth Edition; Alexander McLennan, Andy Bates, Phil Turner & Mike White; Garland Science; 2013

Human Genetics

1. Genetics – A Molecular Approach; Third Edition; Peter J. Russell; Pearson Education, Inc. (Benjamin Cummings), San Francisco; 2010
2. Cell and Molecular Biology; Eighth Edition; E.D.P. De Robertis, E.M.F. De Robertis Jr.; Info-Med Ltd.; 1988
3. Genetics (Bios Instant Notes); Third Edition; G.I. Hickey, H.L. Fletcher and P. Winter; Taylor and Francis Group, New York; 2007
4. Genetics – A Conceptual Approach; Third Edition; Benjamin A. Pierce; W.H. Freeman and Company, New York; 2008
5. New Clinical Genetics; Second Edition; Andrew Read and Dian Donnai; Scion Publishing Ltd., UK; 2011
6. Genetics; Third Edition; Robert F. Weaver and Philip W. Hedrick; Wm. C. Brown Publishers (The McGraw-Hill Companies, Inc.); 1997

7. Human Molecular Genetics; Fourth Edition; Tom Strachan and Andrew Read; Garland Science, USA; 2011
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9. Human Genetics – An Overview; Alice Marcus; Narosa Publishing House; 2010
10. The Science of Genetics – An Introduction to Heredity; Fourth Edition; George W. Burns; Macmillan Publishing Co., Inc., New York; 1980
11. <https://www.ncbi.nlm.nih.gov/books/>
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Bioinformatics

1. Bioinformatics - Concepts, Skills, and Applications; S.C. Rastogi& others; CBS Publishing; 2003
2. Bioinformatics - A practical guide to analysis of Genes & Proteins; Andreas D Baxevanis& B F Francis; John Wiley; 2000
3. Introduction to Bioinformatics; 1st Edition; T K Attwood, D J parry-Smith; Pearson Education, 11th Reprint; 2005
4. Bioinformatics; 1st Edition; C S V Murthy; Himalaya Publishing House; 2003
5. Bioinformatics sequence and genome analysis; David W. Mount; Cold spring harbor laboratory press; 2004
6. Basic Bioinformatics; S. Ignacimuthu, S.J.; Narosa Publishing House; 1995
7. An Introduction to Bioinformatics Algorithms; Neil C. Jones and Pavel A. Pevzner; MIT Press, First Indian Reprint; 2005
8. Bioinformatics - Managing Scientific Data; Zoe Lacroix, Terence Critchlow; Morgan Kaufmann Publishers (Elsevier Science); 2003 (for the V unit)
9. Phylogenetics: Theory and Practice of Phylogenetic Systematics; Second edition; Bruce S. Lieberman; Wiley-Blackwell; 2011
10. Molecular Evolution: A Phylogenetic Approach; Roderick D.M. Page, Dr Edward
- 11.** C. Holmes; Well Publishing; 1998
12. Essential Bioinformatics; JinXiong; Cambridge University Press; 2006
13. Proteomics - From Protein Sequence to Function; 12 S. R. Pennington, M. J. Dunn; First edition; Springer publications; 2001
14. Proteomics; Timothy Palzkill; Springer; 2002

15. Metabolomics - A Powerful Tool in Systems Biology; Jens Hřiriis Nielsen, Michael
16. C. Jewett; Springer; 2007
17. Systems Metabolic Engineering; Dr. Christoph Wittmann, Sang Yup. Lee; Springer; 2012
18. Bioinformatics (Bios Instant Notes); Second Edition (Special Indian Edition); T. Charlie Hodgman, Andrew French and David R. Westhead; Garland Science (Taylor and Francis Group); 2010
19. Understanding Bioinformatics; Marketa Zvelebil and Jeremy O. Baum; Garland Science (Taylor and Francis Group); 2008
20. Bioinformatics Computing – The complete practical guide to bioinformatics for life scientists; Bryan Bergeron; Eastern Economy Edition; Prentice-Hall of India Pvt. Ltd., New Delhi; 2003
21. Bioinformatics; Prakash S. Lohar; MJP Publishers, Chennai; 2009
22. Introduction to Bioinformatics; First Edition; S. SundaraRajan and R. Balaji; Himalaya Publishing House, Mumbai; 2002
23. Molecular Biology – Bios Instant Notes; Fourth Edition; Alexander McLennan, Andy Bates, Phil Turner & Mike White; Garland Science; 2013

Syllabus for T.Y.B.Sc.

Program B.Sc.

Course: ZOOLOGY

Semester VI

Paper III and Practical III

**T.Y.B.Sc.
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Course objectives:

- *To learn the basics of developmental biology.*
- *To comprehend fertilization process and study different patterns of cleavage and formation of embryo.*

Course outcomes:

- *Learners can familiarize with early and later stages of development.*

Unit 1: History & Basic concepts of development

(15 Lectures)

Learning Objectives:

To learn the history and understand basic concepts of development in animals

Desired outcome:

Learners can understand embryo development by studying the important process of cell differentiation, stages of development and morphogenesis.

- 1.1 : Overview of how the modern era of developmental biology emerged through multidisciplinary approaches
- 1.2 : Stages of development- zygote, blastula, gastrula, neurula
- 1.3 : Cell fate & commitment – potency- concept of embryonic stem cells, differential gene expression, terminal differentiation, lineages of three germ layers, fate map
- 1.4 : Mechanisms of differentiation- cytoplasmic determinants, embryonic induction, concept of morphogen, mosaic and regulative development
- 1.5 : Pattern formation- axis specification, positional identification (regional specification)
- 1.6. Morphogenetic movements

Unit 2: Early and Late Embryonic Development

Learning Objectives:

To learn the process of early and late embryonic development in animals.

Desired outcome:

Learners get acquainted with process of early and late embryonic development in animals.

2.1. Early Embryonic Development

Gametogenesis
Egg membranes
Fertilization
Changes in gametes
Monospermy and polyspermy
Planes and patterns of cleavage
Early development of frog
Fate maps
Embryonic induction and organizers

2.2: Late Embryonic Development

Fate of Germ Layers; Implantation of embryo in humans, Placenta (Structure, types and functions of placenta)

Unit 3: Post Embryonic Development and Implications of Developmental Biology

(15 lectures)

Learning Objectives:

To learn post Embryonic Development and Implications of Developmental Biology

Desired outcome:

Learners get acquainted with post Embryonic Development and Implications of Developmental Biology.

3.1 : Post Embryonic Development

Metamorphosis: Changes, hormonal regulations in amphibians;
Regeneration: Modes of regeneration, epimorphosis, morphallaxis and compensatory regeneration (with one example each);
Ageing: Concepts and models

3.2 : Implications of Developmental Biology

Teratogenesis: Teratogenic agents and their effects on embryonic development; Stem cell culture, Amniocentesis.

Unit 4: Chick Embryology

Learning Objectives:

To introduce to the learners the basics of developmental biology with reference to chick as a model and also understand experiments related to it.

Desired outcome:

Learners will be able to understand the processes involved in embryonic development and its application.

4.1. Development of Chick-

- a. Structure of Egg and Sperm
- b. Fertilization, cleavage, blastulation and Gastrulation
- c. Fate map of blastula
- d. Structure of 24 hrs. Chick embryo.
- e. Structure of 33 hrs. Chick embryo.
- f. Structure of 48 hrs. Chick embryo.
- g. Structure of 72 hrs. Chick embryo.

4.2. Chick Foetal membranes or extra embryonic membranes

(Amnion, Chorion, Allantois and Yolk sac) & their significance.

T.Y.B.Sc. Semester VI (Practical) Course

code: USC6ZOP3

Core Course 17

1. Study of types of eggs: Eggs of Insects, Amphioxus, Frog and Chick with the help of Permanent slides/ Model/museum specimens/CD/Chart)
2. Study of Cleavage, Blastula and Gastrula: Amphioxus with the help of CD/Chart/Model/Permanent slides
3. Study of whole mounts and sections of developmental stages of frog through permanent slides:
 - a. Cleavage stages
 - b. Blastula
 - c. Gastrula
 - d. Neurula
 - e. Tail-bud stage
 - f. Tadpole (external and internal gill stages)
4. Study of whole mounts of developmental stages of chick through permanent slides: Primitive streak (13 and 18 hours), 24, 28, 33, 36, 48, 72, and 96 hours of incubation.
5. Study of the developmental stages and life cycle of Drosophila from stock culture.
6. Study of Histological structures of placenta (permanent slide or microphotographs)
 - 1) Epitheliochorial
 - 2) Endotheliochorial
 - 3) Hemochorial
 - 4) Syndesmochorial
 - 5) Hemoendothelial
7. Study of human embryology: Principle and mechanism of ultra sound or ultra-sonography with the help of photograph/flow-chart/Chart
8. Visit to IVF center and submission of report.

References and Additional Readings

1. An Introduction to Embryology 1981, Balinsky B.L., Saunders College, Philadelphia.
2. Developmental Biology; Patterns/Principles/Problems, 1982, Saunders J. W. Collier MacMillan, Publishers, London.
3. Developmental Biology, 1997, 3rd Edition, Gilbert S.F. Saunder Associates Inc. U.S.A.
4. Developmental Biology, 1992 3rd edition, Browder L.W. Erickson C.A. & Williams, R J. Saunders College, Publications, London.
5. A Text Book of Embryology, Dr. Puranik P. G., S. Chand & Co. 6. Developmental Biology, 1984, Browder L.W. , Saunders College Publicaions, U.S.A.
6. Development of Chick embryo, 1972, Lillie. 8. Developmental Biology, 1991, 3rd Edition, Sinaur Associates, Inc. U.S.A. Gilbert, S. F. (2006).
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Syllabus for T.Y.B.Sc.

Program B.Sc.

Course: ZOOLOGY

Semester VI

Paper IV and Practical IV

T.Y.B.Sc. Semester VI (Theory) Course

Code: USC6Z04 Discipline Specific

Elective 18

**Environment and Wildlife management, Bioprospecting,
Zoopharmacognosy and Zoogeography**

Course objectives:

To introduce the learners to understand the importance of different factors of environment and its management, importance of wildlife conservation, pharmacognosy and zoogeography.

Course outcome:

Learners will understand about environment and Wildlife management, and learn the basic concepts of bioprospecting, zoopharmacognosy and Zoogeography.

Unit 1: Environment management

(15 lectures)

Learning Objectives:

To introduce the learners to understand the importance of different factors of environment and its management.

Desired outcome:

Learners will understand the different factors affecting environment, its impact and environment management laws.

1.1 : Natural resources and their classification

Forest resources, water resources (surface and ground), mineral resources, energy resources: renewable and non-renewable resources.

1.2 : Exploitation and modification of natural resources

Impact on climate, flora and fauna.

1.3 : Waste Management

3R's (Reduce, Reuse & Recycle) of solid waste, e-waste, hazardous waste.

1.4 : Water Management

Rain water harvesting, watershed management, effluent treatment, recycling plants, control and treatment of sewage water.

1.5 : Rules and Acts of Environment Management

Environment Protection Act, Air (Prevention and Control of Pollution) Rules- 1982, Water (Prevention and Control of Pollution) Rules-1978, Hazardous Wastes (Management and Handling) Rules-1989, EIA(Environmental Impact Assessment), Role of Central and State Government(Pollution Control Board) and NGOs.

Unit 2: Wildlife management

(15 lectures)

Learning Objectives:

To introduce the learners to the importance of wildlife conservation.

Desired outcome:

Learners will be able to understand the wildlife habitat projects for animal protection.

2.1 : Habit, habitat, territory and niche of wild animals

Herbivores, carnivores, solitary, pack and herd.

2.2 : Threats to wildlife

Diseases (zoonosis and reverse zoonosis), competition, hunting and poaching, encroachment, deforestation, tourism, overgrazing, human-animal conflict and climate change.

2.3 : Wildlife conservation: Techniques and methods

2.3.1: Ex-situ conservation (Zoos, cryogenics, seedbank, germplasm and genebank), in-situ conservation (Bio-reserves, Sanctuaries and National Parks),

2.3.2: Application of GIS and Remote sensing

Unit 3: Bioprospecting and Zoopharmacognosy

(15 lectures)

Objective:

To introduce the learners to understand prospecting in biology and importance of pharmacognosy.

Desired outcome:

Learners will understand the paradigms of discovery and commercialization of biological resources and knowledge gained by self-medication by animals.

3.1 : Bioprospecting

3.1.1. Traditional and modern bioprospecting

3.1.2. Economic value of bioprospecting

- 3.1.3. IPR
- 3.1.4. Bioprospecting and conservation
- 3.1.5. Advantages and disadvantages

3.2 : Zoopharmacognosy

- 3.2.1 Definition and types
- 3.2.2 Self-medication and its mechanism
- 3.2.3 Methods of self-medication through- Ingestion- ants and mammals, Geophagy- invertebrates and birds
- 3.2.4 Absorption and adsorption
- 3.2.5 Applications – birds, mammals, social and trans-generational aspects
- 3.2.6: Contribution to human medicines.

Unit 4: Zoogeography

(15 lectures)

Objective:

To introduce learners to a branch of science dealing with the geographic distribution of animals.

Desired outcome:

The learners will become acquainted with how and why different animal species are distributed around the globe.

4.1 : Introduction

Plate tectonics and continental drift theory.

4.2 : Animal distribution and barriers

4.2.1 : Patterns of animal distribution – continuous, discontinuous, isolation and bipolarity.

4.2.2 : Barriers of distribution –Topographic, climatic, vegetative, large water masses, land mass, lack of salinity and special characteristic habit (homing instinct).

4.2.3 : Means of dispersal – land bridges, natural rafts and drift wood, favoring gales, migration by host, accidental transportation and by human agencies.

4.3: Zoogeographical realms

4.3.1: Palearctic, Ethiopian, Oriental, Australian, Neotropical, Nearctic and Antarctic.

T.Y.B.Sc. Semester VI (Practical)

Course code: USC6ZOP

Discipline Specific Elective 18

1. Estimation of phosphates from sample water.
2. Estimation of BOD and COD from sample water.
3. Estimation of Nitrates from sample water.
4. Estimation of acidity and alkalinity of sample water by methyl orange and phenolphthalein indicator.
5. Determination of soil pH.
6. Comparative study of sound intensity in different places by Decibel meter.
7. Study of threatened animal species inhabiting Indian continent with reasons for decline- Great Indian bustard, One-horned rhinoceros, Royal Bengal tiger, Blackbuck, lion tailed macaque, Nilgiri Thar, Asiatic lion, Snow leopard, Gharial, and Gangetic dolphin.
8. Study of Zoopharmacognosy in ants, cats, elephants and dogs.
9. Indicate the distribution of fauna in the world map w.r.t. to its realm and comment on the pattern of distribution.
10. Study tour/Visit to Zoo/Sanctuary/National Park/Research institute.

References and Additional Readings

Environment management

1. Essentials of Environmental Science; N. Vasudevan; Narosa Publishing House Pvt. Ltd. New Delhi 110002
2. Environmental Biology; P.S Verma, V.K Agarwal; S. Chand & company Ltd. New Delhi 110055
3. A textbook of Environmental Science; Arvind Kumar; APH Publishing Corporation New Delhi 110002
4. Environmental Biotechnology - Basic Concepts and Application; Indu Shekhar Thakur; I. K. International Pvt. Ltd. New Delhi 110016
5. Text book of environmental science; S. C. Santra

Wildlife management

1. Wild life management; Rajesh Gopal
2. Wildlife Management and Conservation - Contemporary Principles and Practices; Paul R. Krausman and James W. Cain III
3. Wildlife Ecology, Conservation, and Management; John M. Fryxell, Anthony R. E. Sinclair, Graeme Caughley

Bioprospecting and Zoopharmacognosy

1. Molecular biotechnology – principles and practices; Channarayappa
2. Biotechnology; P. K. Gupta
3. Biotechnology; B. D. Singh
4. Biotechnology Fundamentals & Applications; S. S. Purohit
5. Pharmacognosy and Pharmaco biotechnology; Ashutosh Kar Trease and Evans Pharmacognosy; Evans, W.C.
6. Pharmacognosy; Kokate, C. K. A. and Purohit, A.P.
7. Practical Pharmacognosy; Gokhale, S. B. and Kokate, C. K.
8. Text book of Pharmacognosy; T. E. Wallis

Zoogeography

1. Zoogeography – The Geographical Distribution of Animals; Philip J. Darlington JR;
2. Academic Publishers, Kolkata
3. Animal geography; Newbegin

4. Vertebrate paleontology; Romer
5. Ecological animal geography; Allee, Park and Schmidt
6. Zoogeography of India and South East Asia; Dr. S.K.Tiwari; CBS Publishers and Distributors, Delhi; 1985



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UGC**

'Best College Award' by University of Mumbai Program: B.Sc

Syllabus of T.Y.B.Sc. Zoology (Fishery Biology)

Choice Based Credit & Grading System (75:25)

w.e.f. Academic Year 2021-22

T.Y.B.Sc. Zoology

Sr. No.	Heading	Particulars
1	Title of Course	Fishery Biology
2	Eligibility for Admission	T.Y.B.Sc. with subject Zoology
3	Passing marks	40%
4	Ordinances/Regulations (if any)	
5	No. of Semesters	Two
6	Level	U.G.
7	Pattern	Semester (75:25)
8	Status	Revised
9	To be implemented from Academic year	2021-22

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4.	Practical Syllabus for Semester V (Course code: USCFB5P1)
5.	Theory Syllabus for Semester VI (Course code: USCFB601)
6.	Practical Syllabus for Semester VI (Course code: USCFB6P1)
7.	References and Additional Reading (Course code: USCFB501, USCFB601)

Fishery Biology (Applied Component)
(Credit Based Semester and Grading System)
(To be implemented from the Academic Year 2021- 2022)

Semester V

Oceanography, Aquaculture Practices, Marketing and Finance

Theory (Any four units to be opted)				
Course	Unit	TOPIC	Credits	L/Week
USACFBIO501	1	Oceanography	2	4
	2	Crafts and Gear		
	3	Farming of Major Carps		
	4	Introduction to other Commercial Aquaculture Practices in Fresh Water		
	5	Culture of Shell fishes and Fin-Fish		
	6	Quality Control and Packaging		
	7	Marketing and Finance		
	8	Case Study and Simulation		
Practical				
USACFBIO5P1		Practical's based on Course USCFB501	2	4

Semester VI

Marine resources, Post-harvest and Farm Engineering

Theory (Any four units to be opted)				
Course	Unit	TOPIC	Credits	L/Week
USACFBIO601	1	Marine Fin-fish of India	2	4
	2	Marine Shellfish of India		
	3	Nutrition		
	4	Diseases		
	5	Preservation and Processing		
	6	Byproducts and Value-added Products		
	7	Farm Engineering		
	8	Open Unit		
Practical				
USACFBIO6P1		Practicals based on Course USCFB601	2	4

Semester V: Theory

Course code: USCFB501

Skill Enhancing Course 1

**Oceanography, Aquaculture
Practices, Marketing and
Finance**

Lectures 60

Credits 2

(Any four units to be opted)

Unit 1: Oceanography

Learning Objective:

- *To study different instruments and equipments in navigation and oceanography*
- *To introduce physical, chemical and biological oceanography*

Desired outcome:

- *Learner shall understand and learn about the use of sea safety, navigational equipments and oceanographic instruments*
- *Learner shall understand basic physical, chemical and biological oceanography*

1.1 : Navigational and sea safety equipments

- i) Life saving devices
- ii) Global Positioning System (GPS)
- iii) Rudder
- iv) Signaling devices

1.2: Oceanographic Instruments

- i) Niskin water sampler
- ii) Peterson's grab
- iii) Dredges
- iv) Fish finding instruments / Methods
- v) Remote sensing
- vi) CTD device

1.3 : Introduction to basic physical, chemical and biological oceanography

Unit 2: Crafts and Gear

Learning Objective:

T.Y.B.Sc. Zoology

- *To study the process of boat building, materials used and various types of diesel engines*

- *To study various types of nets used in fishery*

Desired outcome:

- *Learner shall comprehend boat building techniques and design of engines used in mechanized boats*
- *Learner shall understand the operations of various types of nets and fishing method*

2.1 : Basic boat building (parts, design, material used), methods of protection from foulers and borers

2.2 : Basic studies of marine engines:

- i) Outboard and Inboard Engines
- ii) Winch and Deck Side Equipment

2.3 : Operations:

- i) Gill, Trawl, Purse seine Nets
- ii) Hooks and Lines
- iii) Non-conventional Fishing Methods such as
 - Light Fishing
 - Hose Pipe Fishing
 - Electric Fishing

Unit 3: Farming of major carps

Learning Objective:

- *To study and develop skills in breeding techniques, hatchery, nursery and management of various carps*
- *To study and explore various techniques used in fishery and poly culture practices*

Desired outcome:

- *Learner will understand breeding techniques and skills for culture of major carps*
- *Learner will comprehend hatchery and nursery management of major carps*

3.1 : Breeding techniques of major carps and common carp

3.2 : Hatchery and nursery management of:

- Major carps:
 - i) IMCs: *Labeo rohita* (Rohu), *Catla catla* (Catla), *Cirrhinus mrigala* (Mrigal)
 - ii) Exotic carps: *Hypophthalmichthys molitrix* (Silver carp), *Ctenopharyngodon idella* (Grass carp)
 - iii) *Cyprinus carpio* (Common carp)

3.3 : Mono-culture and polyculture practices:

- i) Extensive
- ii) Semi-intensive
- iii) Intensive

Unit 4: Introduction to other commercial aquaculture practices in fresh water

Learning Objective:

- *To develop skills and understanding of breeding and rearing of sewage-fed fishery, Basa cat fish and Tilapia by novel ways*

Desired outcome:

- *Learner will be equipped to carry out entrepreneurial operations or gain confidence to work in freshwater prawn unit*
- *Learner will gain knowledge about how to breed and rear ornamental fishes and commercially viable fish species*

4.1 : *Macrobrachium rosenbergii* (Freshwater prawn)

- i) Breeding, life cycle, hatchery management
- ii) Monoculture of *Macrobrachium rosenbergii*
- iii) Composite culture of major carps and *Macrobrachium rosenbergii*

4.2 : Ornamental fishes – breeding and rearing:

- i) Egg layers:
 - *Danio spp.* (Danio)
 - *Pterophyllum spp.* (Angel)
 - *Symphysodon spp.* (Discus)
 - *Paracheirodon innesi* (Neon tetra)

- Flower horn (Hybrid variety)
- *Betta splendens* (Siamese fighter)

ii) Live bearers:

- *Poecilia reticulata* (Guppy)
- *Xiphophorus hellerii* (Swordtail)
- *Poecilia velifera* (Tangerine)
- *Poecilia sphenops* (Molly)
- *Xiphophorus maculatus* (Platy)

4.3 : Breeding and rearing of:

- Sewage-fed fishery of air breathing fish: *Pangasianodon hypophthalmus* (Striped catfish), *Clarius spp.*, *Heteropneustes spp.* and *Anabas spp.*
- *Pangasius bocourti* (Basa Catfish)
- All meal (Less bones) *Tilapia* – GIFT (Genetically Improved Farmed *Tilapia*)

Unit 5: Culture of shell fishes and fin-fish

Learning Objective:

- *To study breeding techniques, hatchery and management of fin-fish and shell fishes*
- *To study rearing practices of fin-fish and shell fishes*
- *To study culture of brackish water shrimp*

Desired outcome:

- *Learner shall understand breeding techniques, hatchery and management of fin- fish and shell fishes*
- *Learner shall understand the rearing techniques*

5.1 : Breeding, hatchery, nursery management and rearing (extensive, semi-intensive, intensive)

- i) Fin-fish – *Lates calcarifer* (Sea bass)
- ii) *Litopenaeus vannamei* (Brackish water prawn or Pacific white shrimp)
- iii) *Scylla serrata* (Giant mud Crab)
- iv) *Pinctada vulgaris* (Pearl)

Unit 6: Quality control and packaging

Learning Objective:

- *To comprehend various aspects of quality control and packaging involved in fish processing and marketing*

Desired outcome:

- *Learner will be oriented towards understanding the various stages of quality control*
- *Learner will gain knowledge about the postmortem changes, spoilage mechanisms and methods involved in evaluating the freshness and quality of fishes and prawns / shrimps*
- *Learner shall comprehend the value of maintaining and taking sanitary precautions during the processing and packaging operations*

6.1 : Post mortem changes and mechanism of spoilage

- i) Hyperaemia
- ii) Rigor mortis
- iii) Autolysis
- iv) Rancidity

6.2 : Brief methods for evaluating freshness and quality of fish and prawns / shrimps

- i) Organoleptic
- ii) Microbial
- iii) Chemical

6.3 : Sanitary operations

- i) Maintenance of hygiene of food contact surfaces, storage and equipment
- ii) Water quality, ice, sewage and waste water disposal and effluent treatment plant

6.4 : Various packaging materials used in freezing and canning industry

- i) Polyolefin
- ii) Wax duplex carton
- iii) Master carton
- iv) Can
- v) Lacquered can
- vi) Retort
- vii) Freezing procedures including hygienic washing, dressing

6.5 : Quality Policy and Quality Analysis: ISO 22000/HACCP/ BRC/IFS

Unit 7: Marketing and finance

Learning Objective:

- *To acquaint and instils knowledge of the fundamentals of marketing and finance required for entrepreneurship in fishery related enterprises and co-operatives*

Desired outcome:

- *Learner shall acquire knowledge about traditional marketing practices and role of co-operatives in selling fish*
- *Learner shall be exposed to the avenues and procedure for raising funds for Fishery related entrepreneurial practices*

7.1 : Traditional marketing vis-a-vis role of fishery co-operatives with reference to operations at Satpati, Sasoon dock and Karanja

7.2 : Global marketing and Export-Import procedures and role of Marine Products Exports Development Authority (MPEDA)

7.3 : i) Fund raising:

- Financial institutions
- Schemes and subsidies
- Basic accounting
- Costing and feasibility report

: ii) Role of NABARD (National Bank for Agriculture and Rural Development) for refinancing and **NFDB** (National Fishery Development Board, Hyderabad) for funding through the State Government

Unit 8: Case Study and Simulation

Case Study and Simulation is one of the eight units and hence may or may not be opted by the college. If opted, teachers in consultation with the students shall select the case studies for this unit every year, if required, and shall seek endorsement of the Head and the Principal.

Colleges/ Institutes have to select the topics as per their needs and available resources. It is pertinent to note that the case studies and simulations shall be operational and available in the syllabus only till it comes under the scope of internal assessment.

Learning Objective:

- *To inculcate entrepreneurial abilities and skills so as to make the learner confident and prepare them to raise new projects and venture in the realm of fishery biology*
- *To understand the concepts and to develop the acumen of the learner in a better way*
- *To assess varying dimensions while taking decisions in fishery biology*

Desired outcome:

- *Learner will gain technical and financial knowledge in fishery biology business ventures*
- *Learner will develop better acumen so as to take wise and necessary decisions while participating in fishery biology related projects*

(Any eight from suggested below or more, developed by teacher)

- a) Sawantwadi New Fish Market developed through NFDB funding
- b) Trilok foods, an RTE industry established as PPP through DST funding
- c) Sewage-fed fishery; Kolkata model
- d) Pancham Aquaculture
- e) Naik Oceanic
- f) Aquaponics, Hydroponics
- g) Mahseer Ranching at Dehu
- h) Integrated fish farm goatery, piggery, poultry, dairy, etc.
- i) Juchandra Village

Semester V Practical

Course code:

USCFB5P1

Skill Enhancement Course 1

- 1) Identification and functioning of oceanographic instruments:
 - Niskin water sampler
 - Peterson's Grab
 - Dredge
- 2) Identification of various stages of development of carps and study of sexual dimorphism in adults.
Indian major carps:
 - *Labeo rohita* (Rohu)
 - *Catla catla* (Catla)
 - *Cirrhinus mrigala* (Mrigal)Exotic carps:
 - *Cyprinus carpio* (Common Carp)
 - *Hypophthalmichthys molitrix* (Silver Carp)
 - *Ctenopharyngodon idella* (Grass Carp)
- 3) a) Identification of *Litopenaeus vannamei* (Pacific white shrimp) and *Macrobrachium rosenbergii* (Freshwater prawn)
b) Study of sexual dimorphism in adults
- 4) Identification of fishes:
 - *Anabas testudineus* (Climbing perch)
 - *Clarius batrachus* (Walking catfish)
 - *Boleophthalmus spp.* (Mudskipper)
 - *Pangasianodon hypophthalmus* (Iridescent shark)
 - *Pangasius bocourti* (Basa catfish)
 - *Tilapia*(GIFT)
- 5) Identification of:
 - A) Ornamental fishes:
 - *Pterophyllum spp.* (Angel)

- *Xiphophorus hellerii* (Swordtail)
- *Paracheiroduon innesi* (Neon tetra)
- *Betta splendens* (Siamese fighter)
- *Danio spp.* (Danio)
- *Symphysodon spp.* (Discus)
- Flower Horn (Hybrid variety)

B) Aquatic plants:

- Ludwigia
- Cabomba
- Corkscrew *Vallisneria*
- Aquarose
- Amazon Sword plant

C) Aquarium accessories:

- Aerator
- Under Gravel Filter
- Internal Filter
- External / Canister Filter
- Food dispensers

6) Study of models and functioning of D 81 hatchery, Shirgur's hatcheries and Chinese hatchery.

7) Organoleptic tests for fish and prawn / shrimp

8) Total Plate Count (TPC) of bacteria from fish

9) Identification of packaging materials:

- Waxed duplex carton
- Master carton
- Simple cans
- Coated [Lacquered] cans
- Polyolefin

- Retort
- 10) Estimation of toxins and moulting retardant
- H₂S (qualitative)
 - Ammonia (qualitative)
 - Ca (quantitative)
 - Mg (quantitative)
- 11) Photographic documentation of fishery biology related topics.
Submission of 5 hard and soft copies of 5 original photographs taken by the learner (exit details required)
- 12) Assignment (may be submitted in a group not exceeding three students)

Please refer the Annexure I for the suggested topics for assignment for Course code USACFBIO5P1.

***Note – The practicals may be conducted by using specimens authorized by the wild life and such other regulating authorities though it is strongly recommended that the same should be taught by using photographs/audio-visual aids/simulations/ models etc. as recommended by the UGC and as envisaged in the regulation of the relevant monitoring bodies. No new specimens, however, shall be procured for the purpose of conducting practicals mentioned here-in above.**

N.B:

- I) It is pertinent to note that we have to adhere strictly to the directions as given in the UGC Circular F14-4/2006 (CPP-II).
- II) Apart from the Institutional Animal Ethics Committee (IAEC) and any other Committee appointed by a Competent Authority / Body from time to time, every college should constitute the following Committees:
- 1) A Committee for the Purpose of Care and Supervision of Experimental Animals (CPCSEA) and
 - 2) A Dissection Monitoring Committee (DMC) to ensure that no dissections or mountings are done using animals.

Composition of DMC shall be as follows:

- i) Head of the Concerned Department (Convener / Chairperson)

- ii) Two Senior Faculty Members of the concerned Department
- iii) One Faculty of related department from the same College
- iv) One or two members of related department from neighbouring colleges.

USE OF ANIMALS FOR ANY EXPERIMENT /DISSECTION /MOUNTING IS BANNED. SIMULATIONS, AUTHORIZED PERMANENT SPECIMENS/SLIDES, CHARTS, MODELS AND OTHER INNOVATIVE METHODS ARE ENCOURAGED.

Semester VI: Theory

Course code: USCFB601

**Skill Enhancing Course 2
Marine resources,
Post-harvest and Farm
Engineering**

(Any four units to be opted)

Lectures 60

Credits 2

Unit 1: Marine Fin-fish of India

Learning Objective:

- *To study coastal and deep-sea fishes*
- *To study commercial potential and major landing centres*

Desired outcome:

- *Learner shall understand deep sea and coastal fishes.*
- *Learner shall understand commercial potential and know about the major landing centres of the fishes*

1.1 : Coastal fisheries:

- Pampus argenticus* (Silver pomfret)
- Parastromateus niger* (Black pomfret)
- Eleutheronema tetradactylum* (Threadfin)
- Protonibea diacanthus* (Two-spined Jewfish or Ghol)
- Nemipterus japonicus* (Blackmouth splitfin)
- Rastrelliger kanagurta* (Mackerel)
- Scomber guttatus* (Seerfish or Surmai)
- Sardinella longiceps* (Indian Oil Sardine)

1.2 : Deep sea fisheries (more than 45 fathoms) of Indian exclusive economic zone

- *Thunnus alalunga* (Longfin tuna)
- *Sarda orientalis* (Striped bonito)

1.3 : Commercial potential and major landing centers of the above fishes

Unit 2: Marine shell fish of India

Learning Objective:

- *To develop an in-depth understanding of crustacean and molluscan fisheries*

Desired outcome:

- *Learner shall understand crustacean and molluscan fisheries*
- *Learner shall understand the performance of landing centers of above fisheries*

2.1 : Crustacean fisheries

- Penaeus monodon* (Giant tiger prawn)
- Fenneropenaeus indicus* (Indian prawn)
- Metapenaeus affinis* (Jinga shrimp)
- Parapenaeopsis stylifera* (Kiddi shrimp)
- Acetes indicus* (Jawala paste shrimp)
- Panulirus polyphagus* (Mud spiny lobster)
- Scylla serrata* (Giant mud crab)

2.2 : Molluscan fisheries

- Crassostrea spp.* (Oyster)
- Sepia pharaonis* (Pharaoh cuttlefish)
- Loligo duvaucelii* (Indian squid)

2.3 : Commercial potential and major landing centers of the above shell fishes

Unit 3: Nutrition

Learning Objective:

- *To study, acquaint and discover the growing market for fish nutrition*

Desired outcome:

- *Learner will get acquainted with basics of nutritional requirements at various developmental stages of fish and crustaceans*

3.1 : Nutritional requirements at various stages of development of fish and crustaceans

3.2 : Culture of natural feed:

- Chaetoceros*
- Infusoria*
- Artemia*
- Brachionus*
- Daphnia / Moina spp.*

3.3 Algalogy – Identification and culture of commercially important nutritious algae and its products

3.4 Formulated / Pelleted feed – Understanding the composition and use of formulated

feed for fish and prawns / shrimps at various stages

Unit 4: Diseases

Learning Objective:

- *To acquire knowledge of the various aspects of diseases affecting fishes*

Desired outcome:

- *Learner will be oriented towards understanding causes, pathogenicity, prophylaxis and preventive measures of various fish diseases and physiological disorders*

4.1 Viral diseases, prophylaxis and preventive measures

4.2 Bacterial, fungal, protozoan infections and treatment

4.3 Crustacean infections and treatment

4.4 Physiological disorders (Dropsy) / diseases and treatment

Unit 5: Preservation and Processing

Learning Objective:

- *To derive knowledge about various fish preservation and processing methods*

Desired outcome:

- *Learners will acquire the knowledge and would put in to practice the preservation and processing techniques for commercial ventures*

5.1 Traditional methods and their modifications:

- i) Icing
- ii) Drying
- iii) Salting

5.2 i) Introduction to refrigeration: Types and properties of refrigerants

- i) Types of freezers:
 - a. Brine
 - b. Air blast
 - c. Tunnel
 - d. Contact plate
 - e. Cryo-quick
 - f. IQF: Individual Quick Freezing

ii) Freezing Procedures:

- a. PUD (Peeled and Un-deveined)
- b. DV (Deveined)**

5.3 Principle and steps involved in can reform and canning of fish and shrimp in various media.

5.4 Equipment and utensils used in seafood processing

Unit 6: By-products and Value-Added Products

Learning Objective:

- *To acquire knowledge of fish by-products, value-added products and good manufacturing practices*

Desired outcome:

- *Learner will gain sound knowledge about the fish by-products and value-added products*
- *Learner will explore good manufacturing practices while manufacturing these products*

6.1 Proximate composition of fish meat and products

6.2 Introduction to by-products

- Fish protein concentrate
- Fish maws / Isinglass
- Fish hydrolysates
- Chitin, Chitosan
- Glucosamine hydrochloride
- Gelatin
- Fish silage
- Surimi and imitation products
- Pearl essence

6.3 Different types of value-added products from fish and shell fish

- Fish / Prawn / Shrimp pickle
- Fish wafers
- Acetes indicus* (Prawn) chutney
- Fish soup powder
- Fish / Crab steaks
- RTE (Ready To Eat)
- Battered and breaded products
- Marinated tandoori prawns

ix) Prawn curry

6.4 Good manufacturing practices: Health and training of personnel, hygiene

Unit 7: Farm engineering

Learning Objective:

- *To acquire knowledge about farm engineering and novel fish culture practices*

Desired outcome:

- *Learner will understand the selection process of hatchery sites and various types of designs and construction of aquaculture farm practices*
- *Learners will comprehend the uses of equipment and accessories involved in aquaculture farms*

7.1 Site selection, designing and construction of hatchery and farms for extensive, semi-intensive and intensive freshwater / brackish-water aquaculture

7.2 i) Raft culture

ii) Rope culture

iii) Pen culture

iv) Cage culture with special reference to *Rachycentron canadum* (Cobia)

7.3 Equipment and accessories used in various aqua farms

Unit 8: Open Unit

Open unit is one of the eight units which may or may not be opted by the college. Teachers in consultation with the students shall define syllabus under this unit every year, if required, and shall seek endorsement of the Head and the Principal.

Colleges/institutes have to select the topics as per their needs and available resources.

It is pertinent to note that the open unit shall be operational and available in the syllabus only till it comes under the scope of internal assessment.

Learning Objective:

- *To teach any one of the units prescribed in the syllabus with more details and in-depth knowledge leading to specialization in the capsule of units selected.*
- *To incorporate the topics of special need of the area which are otherwise not covered in the syllabus.*
- *To give scope to creativity and wisdom of a teacher who wants to deal with the latest developments in the subject without waiting for the university to revise the Syllabus.*

Course code:

USCFB601P Skill

Enhancing Course 2

1) Identification of marine fishes.

- *Pampus argenticus* (Silver pomfret)
- *Parastromateus niger* (Black pomfret)
- *Eleutheronema tetradactylum* (Threadfin)
- *Protonibea diacanthus* (Two-spined Jewfish or Ghol)
- *Nemipterus japonicus* (Blackmouth splitfin)
- *Rastrelliger kanagurta* (Mackerel)
- *Scomber guttatus* (Seerfish or Surmai)
- *Sardinella longiceps* (Indian Oil Sardine)
- *Thunnus alalunga* (Longfin tuna)

2) Identification of Crustaceans and Molluscs.

- *Penaeus monodon* (Giant Tiger Prawn)
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- *Metapenaeus affinis* (Jinga shrimp)
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- *Scylla serrata* (Giant mud crab)
- *Crassostrea spp.* (Oyster)
- *Sepia pharaonis* (Pharaoh cuttlefish)
- *Loligo duvaucelii* (Indian squid)
-

3) Preparation of formulated feed for fish and prawn.

4) Identification of parasitic infections in aquatic organisms.

- Fungal – Dermatomycosis
- Bacterial – Fin/Tail rot and Dropsy
- Protozoan – Costiasis and White Spot
- Crustacean – Argulosis

5) Fish dressing, filleting, prawn peeling – PUD, DV and grading.

6) Fish morphometry – Length weight relationship of a suitable fish.

7) Preparation of Surimi, Fish protein concentrate.

- 8) Preparations of fish burger, fish fingers, fish/prawn pickle, fish chutney, fish curry.
- 9) Preparation of Chitin – Chitosan, Pearl essence.
- 10) Identification of various farm equipment such as:
 - Feeding cups / Trays
 - Paddle wheel aerator
 - Fountains
 - Sluice gate models
 - Elbow pipe outlets
- 11) Study of models of raft, pen, cage culture and materials used in rope culture.
- 12) Project – Feasibility / Scientific.
- 13) Field Visit Report.

Please refer the Annexure II for the suggested field visits and Annexure – III for suggested topics for projects for Course code USACFBIO6P1.

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References and Additional Reading

1. A Text Book of Marine Ecology by Nair M.B. and Thumpy D.H. – Tata MacGraw Hill Pub. – New Delhi.
2. An Introduction to Fishes by Khanna S.S. – Central Book Depot, Allahabad (1993).
3. Aquaculture, Principles and Practices by Pillay T.V.R. – Fishing News Books (1988).
4. Course Manual in Fishing Technology by Latha Shenoy, CIFE, Versova, Mumbai.
5. Crafts and Gear of India by Y. Shrikrishnan and Latha Shenoy – ICAR Pub.
6. Ecological Methods for Field and Laboratory Investigations by P. Michael. The Oceans By Svedrup H.V. – et.al. - Asian Pub. House.
7. Financial management by Prasanna Chandra- Seventh Edition.
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19. Introductory Oceanography by Harold Thurman – Printis Hall Pub. London – 8th Edition.
20. Marine Ecology by Tait R.B. – Oxford Press.
21. Marine Fish and Fisheries by Dr. D. V. Bal and K.V. Rao - Tata MacGraw Hill Pub.
22. New Delhi.

23. Marketing Management by Philip Kotler.
24. Modern Fishing Gear Technology by N. Shahul Hameed, Boopendranath – Daya Pub. House – 2000.
25. Prawn and Prawn Fisheries by Kurian and Sebastian.
26. Project Management by Prasanna Chandra.
27. Refrigeration and air conditioning By C. P. Arora published in 1981.
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30. The Book of Indian Shells by Deepak Apte – Oxford Uni. Press.
31. Wealth of India – Vol. IV – CSIR Pub.

For Additional and Latest Information on the topics, various Web Sites can be visited.