



## LATE RAMESH WARPUDKAR ACS COLLEGE, SONPETH DIST.PARBHANI

### PROGRAMME OUTCOMES AND COURSE OUTCOMES

The college has clearly stated following learning outcomes stated in vision and mission statement and objectives of the college.

**Vision:** Reaching to the Unreached

**Mission:** To offer opportunities of the empowerment to the rural learners by imparting quality higher education within the capacities.

**Objectives:**

- To strive for imparting higher education to rural masses in general and girls in particular.
- To seek socio-cultural transformation of rural youths.
- To inculcate the values like national integration, patriotism, liberty, equality, fraternity, humanity and tolerance among youths.
- To nurture the quality of social and civil responsibilities among the students.
- To create youths capable to be employed.

The students and staff are made aware of these through the prospectus and meetings. Various curricular, co-curricular, cultural and extension activities are organized to these effects. Fresher's are aware about these objectives in the induction programme. The discipline wise program outcomes are as following:

#### **Program Outcomes: B A. (Bachelor of Arts)**

Our college is affiliated to Swami Ramanand Teerth Marathwada University, Nanded. This college offers B A in English, Marathi, Hindi, History, Political Science, Public Administration and Economics. The university has not designed the program outcomes in its curriculum. However the college has designed, based on the subjects offered, the following program outcomes of the B A program.

1. The study of language, literature and social sciences will develop liberal approach among the students.
2. The students will be able to know the history of mankind, its evolution, progress and making of our nation.
3. Students will get aware of the functioning of the society in its various forms through social institutions like religion, politics, bureaucracy, family, marriage and caste.
4. Students will be able to understand the principals and approaches to the study of arts and literature.
5. The students will be sensitive to the socio-political, economical issues around them.
6. The students will get sensitized to the social, political, economical and gender issues.
7. New socio-political leadership will be developed.
8. The B.A. graduate students can pursue B.Ed. course and opt teaching career in the schools.
9. Students can do Post Graduate Studies in their respective subjects studied in 'Under Graduate' level.



10. They are eligible to appear for any competitive exams conducted by Union Public Service Commission (UPSC), Maharashtra Public Service Commission (MPSC), Indian Railway Board, etc for entering into the government services.

**Program Specific Outcomes: B A (English)**

1. English language is considered as the window of Knowledge.
2. Most useful for competitive exams at various levels.
3. Useful for electronic and social media
4. Students will get job opportunities in various fields.
5. Student will enable to communicate in English Language in domestic as well as at international platforms.
6. Students will attempt creative writing in different forms.
7. Students will be able to write book review.
8. Students will be able to frame messages, notices, formal letters, personal diary and reports.
9. Students will be able to express their feelings and emotions with correct grammatical structure.
10. Important Function of English literature is to teach a way of living, order of living and pattern of living.

Students will get accustomed with the following forms of literary genre:

**A. Poetry/Epic/ Songs**

Students will be able to study the very old form of literature i.e. Poetry. They will be able to understand and to express feelings and emotions in lyrical form. They will get acquainted with rhymes and lyrics. There is opportunity for students to try their hands at creative writings.

**B. Drama:**

Since drama is to be enacted on stage, students will get opportunities to perform it on the various occasions and improve their quality of expression. Students will be able to study the drama through the history and will get opportunity to read great dramatists and their popular works.

**C. Fiction:**

Students will get acquainted with the short and long narratives. Fiction has been the most popular form of literature that enhances the taste of reading. It helps students in widening the sensibilities of the students.

**D. Literary Criticism:**

Students will be able to develop critical approach to the various literary forms and understand its characters. They will be able to say that how a particular work of art is to be enjoyed. Students will be able to write and analyze literature. Students will understand how practical criticism is performed at various levels.

**BAFY: English Major: NEP 2020 (With effect from Academic Year 2024-25)**

**Semester I**

**DSC (Major) HENGCT1101: Understanding Literature -I**

**Course Outcomes:**

At the end of the course, the students will be able to

1. get introduced to literature



2. study various genres of literature
3. read various pieces of prose essays, short stories, and novellas
4. get motivated to concentrate on various aspects of literature

### **DSC (Major) HENGCT1102: Understanding Prose -II (Essay)**

#### **Course Outcomes:**

- Learners will be able to comprehend Non-fiction Prose, particularly essays.
- Learners will develop an interest in understanding and appreciating the essays of well-known writers.
- They will be acquainted with the literary genre i.e. essays.
- Learners will be enriched in prose for diverse thematic expressions.
- Learners will attain a certain degree of proficiency in critically analyzing and interpreting essays.

### **Generic Elective / Open Elective in English HENGGE1101:**

#### **English for Competitive Exams–I**

Course Outcomes: After the completion of the course, the learners will be able to:

- Use appropriate tense forms
- Use vocabulary for acquiring proficiency in English
- Design and transform grammatically correct sentences
- Attain the skill of essay writing

### **Skill Enhancement Course (SEC) in English HENGSC1101: Soft Skills**

Course Outcomes: After the completion of the course, the learners will be able to:

1. Built soft skills, discover their self and plan for their career
2. Adopt habits and values for building personality
3. Develop leadership qualities

## **Semester II**

### **Developing Written Communication (Compulsory English)**

Course Outcomes: After the completion of the course, the learners will be able to:

1. Write Effectively
2. Master writing skills required for professional success
3. Adopt written communication skills for career development

### **BAFY: English Major: NEP 2020**

#### **HENGCT1151: Understanding Short Story Paper III**

##### **Course Outcomes:**

1. This course will acquaint the students with the basics and the elements of the genre of short stories.
2. The students will have an introduction to various cultures through the selected short stories.
3. This course will enable the students to understand and critically appreciate 'Short Story' as a genre of fictional prose.
4. The human values and ethics entailed in the stories will be inculcated in the students' minds.

#### **HENGCT1152: Understanding Novella Paper IV**

##### **Course Outcomes:**



- 1) The learners will be able to comprehend popular novellas.
- 2) The learners will be acquainted with socio-cultural positions in the prescribed novellas.
- 3) The students will learn popular novellas at the national and international levels.
- 4) The students will acquire an interpretation mechanism.
- 5) The students will understand the narrative techniques.

**Generic Elective (GE) / Open Elective (OE) HENGGE1151:  
English For Competitive Exams - II**

**Course Outcomes:** After the completion of the course, the learners will be able to:

- Write a précis of the given text
- identify and use various clause types in English
- develop the ability to comprehend an unknown passage
- identify the common errors and overcome it

**Skill Enhancement Course (SEC) HENGSC1151: Body Language**

**Course Outcomes:** After the completion of the course, the learners will be able to:

1. Understand and articulate non-verbal communication skills
2. Master the theoretical aspects of body language
3. Adopt non-verbal communication skills for career development

**Course Outcomes:**

**Compulsory English - Second Year Semester III  
(Ability Enhancement Compulsory Course) (AEC)(4)**

**Course Outcomes:**

1. Students will get acquainted with short stories, essays on a variety of important topics,
2. Students will understand and appreciate prose writings of well-known writers,
3. To acquaint them with 'prose', its meaning and importance,
4. Students will be able to explain grammar items such as, Idioms, Phrases, and reported speech etc.
5. Students will be able to write grammatically accurate sentences, by identifying correct reported speech in writing English.

**Semester IV**

**Compulsory English - Second Year  
(Ability Enhancement Compulsory Course)(AEC)(4)**

**Course Outcomes**

1. Students will be able to understand and appreciate short lyrical poems.
2. Student will be able to comprehend the inherent rhythmic beauty of lyrical poetry,
3. They will get opportunity to read and understand famous world poets such as Wordsworth, Blake, Keats, Byran, Browning, Lanston Hughes, Tagore etc,
4. Students will comprehend the language skills of listening, speaking, reading and writing.
5. Students will get acquainted with the importance of non-verbal communication, i.e. body language so as to make communicative situations more meaningful, positive and effective.



**Optional English - Second Year  
Semester III**

**Paper No. V**

**Title: Study of Poetry- Sonnets & Elegy**

**Course Outcomes:**

1. Students will get acquainted with the literary genre of 'poetry,' particularly sonnet & Elegy,
  2. Students will be able to know the meaning, types, features and functions of "sonnet Elegy."
  3. Students will be able to read, understand, and appreciate sonnet, elegy.
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**Optional English - Second Year Semester III**

**Paper No. VI**

**Title: Study of Prose- Essays**

**Course Outcomes:**

1. Students will get acquainted with the literary genre of 'prose,' particularly Essays.
  2. They will understand the meaning, types, features and functions of "Prose -Essays".
  3. Students will get encouraged to read, understand, and appreciate Essays.
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**Optional English - Second Year Semester IV**

**Paper No. VII**

**Title: Study of Poetry- Odes and Ballads**

**Course Outcomes:**

1. Students will get acquainted with the literary genre of 'poetry,' particularly Odes and Ballads.
  2. They will understand the meaning, types, features and functions of "Odes and Ballads"
  3. Students will get encouraged to read, understand, and appreciate Odes and Ballads.
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**Optional English - Second Year: Semester IV**

**Paper No. VIII**

**Title: Study of Prose- Autobiography**

**Course Outcomes:**

- 1 Students will get acquainted with the literary genre of 'prose,' particularly Autobiography.
- 2 They will understand the meaning, types, features and functions of "Autobiography."
3. Students will get encouraged to read, understand, and appreciate Autobiography.

**Skill Enhancement Course (SEC) - Second Year**

**Skills for Employability-I**

**Semester III**

**Course Outcomes:**

1. Students will get the enough confidence to meet the requirements of the 21st century learners.
2. Students will be equipped with rich Vocabulary comprising Spelling and Pronunciation in English.



3. Students will develop dialogues for Conversation Skills.
4. Students will develop for written communication.
5. Students will develop strategies for professional skills and Soft Skills.

**BA Third Year**  
**(Semester + CBCS Pattern Structure)**  
**Optional English**  
**DSE I - Semester V**

**Course Outcomes:**

**Title of the course: Literary Theory and Criticism (A) Introduction to Literary Criticism**

**Course/Paper code: DSE-ENG- I**

**Course Outcomes:**

- 1) The learners would develop a critical ability to judge literary texts
- 2) Critical insight into the past theorists would be developed

**GE I –Semester V**

**Title of the course: Modern English Structure (A) Introduction to English Speech Sounds**

**1. Course/Paper code: GE-ENG- I**

**Course Outcomes:**

- 1) The learners would be able to understand the system of speech with English sounds
- 2) The ability to understand and reproduce standard patterns of speech is facilitated

**DSE II Semester VI**

**2. DSE-ENG- II-Title of the course: Literary Theory and Criticism (B) Introduction to Literary Theory**

**Course/Paper code: DSE-ENG- II**

**Course Outcomes:**

- 1) Students will get the knowledge about contemporary theories of criticism.
- 2) Critical ability to carry out practical criticism will get enhanced.
- 3) The learners would develop ability to analyze literary texts according to the rules of prosody.
- 4) Critical insight into the contemporary theories would be developed.
- 6 Student will get acquainted with the global critical schools

**Semester VI**

**GE II –Title of the course: Modern English Structure (A) Introduction to English Grammar**

**Course/Paper code: GE-ENG- II**

**Course Outcomes:**

- 1) Learners are enabled to understand the logics and practices in the field of English grammar
- 2) The foundational structure of English grammar is explained
- 3) Learners would be able to use the language with grammatical correctness
- 4) Student will get acquainted with the English Word Classes.
- 5) Student will get acquainted with the word structures and affixes.
- 6 Student will get acquainted with the basic clauses and phrases in English

- 7) They will understand the sentence structure and forms and meaning
  - 8) Students will identify the common errors and ambiguities in English sentences.
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### **B A. T. Y. Skill Enhancement Course**

3. Title of the Course: Life Skills-I Sem. V &
4. Title of the Course: Life Skills-II Sem. VI

### **Paper Code: SEC-ENG III**

#### Course Outcomes:

1. Learners will get developed with the personal and social skills.
2. Gender awareness will be created among students.
3. Skills for individual and group activities will be developed among students.

### **MARATHI**

#### **BA FY SEM- I - MAR- I**

##### **Outcomes -**

- 1) कथा वाङ्मयाच्या विविध प्रकारांची ओळख.
- 2) विद्यार्थ्यांची कथात्मदृष्टी विकसित करणे.
- 3) साहित्याभिरुचीच्या आकलनकक्षा रुंदावणे.
- 4) भाषिक आणि वाङ्मयीन सौंदर्यदृष्टीचा विकास.
- 5) मराठीच्या विविध बोलींचा परिचय.

#### **BA FY SEM- I - MAR- II**

##### **Outcomes -**

१. काव्यप्रवाहातील विचारधारांची ओळख.
२. कवितेमधून प्रकट झालेल्या मानवी मूल्यांचे आकलन.
३. भाषिक आणि वाङ्मयीन सौंदर्यदृष्टीचे विकसन.
४. कवितेच्या विविध रचनाप्रकारांचा परिचय.
५. प्राचीन आणि आधुनिक काव्यप्रकारांची ओळख.

#### **BA FY SEM- II - MAR- III**

१. महामानवाच्या व्यक्तिमत्वामधून प्रेरणा.
२. मानवी मूल्यांची रुजवणूक करणे.
३. आत्मकथनपर, चरित्रपर, प्रवासवर्णनपर व इतर कथात्म साहित्यनिर्मितीस प्रेरक वतावरणनिर्मिती.
४. वाचन आणि लेखन अभिरुची वृद्धिंगत करणे.

**BA FY SEM- II - MAR- IV**

१. आधुनिक मराठी कवितेचा परिचय .
२. काव्यप्रवाहातील प्रकटलेल्या मानवी मूल्यांचे आकलन .
३. कवितेचे रचनाप्रकार, भाषा आणि प्रतिमासृष्टीचा अभ्यास .
४. मराठी काव्य प्रवाहातील वैचारिक अधिष्ठानांचा शोध.

**BA SY SEM- III - MAR- V**

१. गद्य संकल्पनेचा परिचय.
२. मानवी मूल्यांची रुजवण .
३. आत्मकथनपर, चरित्रपर, प्रवासवर्णनपर व इतर गद्यसाहित्य निर्मितीस प्रेरक .
४. वाचन आणि लेखन यांची अभिरुची वृद्धिंगत करणे.
५. मराठी साहित्याकडे वाचकांना आकर्षित करणे.

**BA SY SEM- III - MAR- VI**

१. आधुनिक मराठी नाटकाचा परिचय .
२. नाट्यप्रवाहातून प्रकटलेल्या मानवी मूल्यांचे आकलन .
३. मराठी वाङ्मय प्रवाहाच्या स्वरूप आणि व्याप्तीचा मागोवा.
४. नाट्यरचना, प्रकार, भाषा आणि प्रतिमासृष्टीचा अभ्यास .
५. मराठी नाट्यप्रवाहातील वैचारिक अधिष्ठानाचा शोध.

**BA SY SEM- IV - MAR- VII**



- 1) कादंबरी वाङ्मयाच्या विविध प्रकाराची ओळख होते.
- 2) विद्यार्थ्यांची कथात्मदृष्टी विकसित होते.
- 3) कादंबरी अध्ययनामुळे जीवन आकलनकक्षा रूदावतात.
- 4) भाषिक आणि वाङ्मयीन सौन्दर्यदृष्टीचा विकास.
- 5) मराठीच्या विविध बोलींचा परिचय .

**BA SY SEM- IV - MAR- VIII**

१. विचारधारांची ओळख.
२. मानवी मूल्यांचं आकलन.
३. भाषिक आणि वाङ्मयीन सौन्दर्य दृष्टीचे विकसन.
४. विविध तत्त्वज्ञानाचा परिचय.
५. सामाजिक प्रश्नांची ओळख.

**BASY Semester- IV -  
Marathi- Paper VIII**

**मराठी लोकवाङ्मय**

**उपयोगिता**

१. लोकधारांची ओळख.
२. मानवी मूल्यांचं आकलन.
३. भाषिक आणि वाङ्मयीन सौन्दर्य दृष्टीचे विकसन.
४. विविध लोकपरंपरांचा परिचय.
५. सांस्कृतिक प्रश्नांची ओळख.

**BA SY SEM- III - MAR- SEC -I**

१. संभाषण कौशल्य विकासाला सहाय्य.
२. मराठी भाषा क्षमतेच्या वाढीस मदत.
३. संभाषण क्षेत्राची दारे खुली
४. विविध व्यवसाय क्षेत्रात संधी

**BA SY SEM- IV - Marathi- SEC -II**

१. लेखन कौशल्य विकासाला सहाय्य.
२. मराठी भाषा क्षमतेच्या वाढीस मदत.
३. लेखन क्षेत्राची दारे खुली
४. विविध व्यवसाय क्षेत्रात संधी

**BATY- SEM- V DSE MAR-I**

- १) मध्ययुगीन कालखंडातील महत्त्वपूर्ण भक्तिसंप्रदायांची ओळख .
- २) मध्ययुगीन कालखंडातील वाङ्मयातून प्रकट झालेल्या मानवी मूल्यांचे आकलन
- ३) मध्ययुगीन मराठी वाङ्मयीन चळवळी व प्रेरणांचे आकलन.
- ४) मध्ययुगीन वाङ्मयाच्या निर्मितीवर आणि वाङ्मयाच्या स्वरूपाचे ज्ञान.
- ५) मध्ययुगीन कालखंडातील वाङ्मयीन रचना प्रकारांचा परिचय.

- १) वाङ्मयीन दृष्टिकोनाचे विकसन.
- २) भारतीय साहित्यशास्त्राची ओळख.
- ३) पाश्चिमात्य साहित्यविचारांचा परिचय.
- ४) रसविचारांचे पायाभूत ज्ञान.
- ५) शब्दांच्या विविध अर्थांचे ज्ञान.

#### BATY- SEC- III

- १) मराठी भाषिक क्षमतांच्या वाढीस मदत.
- २) मराठी भाषिक कौशल्ये विकसाला वाव.
- ३) विविध क्षेत्रातील व्यावसायिक संधी.
- ४) मराठी भाषेतील ग्रंथ प्रकाशनाचे स्वरूप समजून घेण्यास मदत.

#### BATY- SEM- V DSE MAR-II

- १) मध्ययुगीन कालखंडातील महत्त्वपूर्ण भक्तिसंप्रदायांची ओळख .
- २) मध्ययुगीन कालखंडातील वाङ्मयातून प्रकट झालेल्या मानवी मूल्यांचे आकलन
- ३) मध्ययुगीन मराठी वाङ्मयीन चळवळी व प्रेरणांचे आकलन.
- ४) मध्ययुगीन वाङ्मयाच्या निर्मितीचे आणि वाङ्मयाच्या स्वरूपाचे ज्ञान.
- ५) मध्ययुगीन कालखंडातील वाङ्मयीन रचनाप्रकारांचा परिचय.

#### BATY- SEM- V GE MAR-II

- १) भाषिक ज्ञानाची वृद्धी.
- २) मराठी भाषेच्या इतिहासाची ओळख.
- ३) लेखनविषयक सजगता.
- ४) मराठी व्याकरणिक घटकांचे ज्ञान.

**BATY- SEC- III**

- १) मराठी भाषिक क्षमतांच्या वाढीस मदत.
- २) मराठी भाषिक कौशल्ये विकसाला वाव.
- ३) विविध क्षेत्रातील व्यावसायिक संधी.
- ४) मराठी भाषेतील ग्रंथ प्रकाशनाचे स्वरूप समजून घेण्यास मदत.
- १) विविध प्रकारच्या कार्यक्रमांचे आयोजन.
- २) विविध क्षेत्रांतील व्यवसायांच्या संधी.
- ३) देहबोलीच्या वापरातून प्रभावी संभाषण.
- ४) मुद्रितशोधनासाठीचे कौशल्ये विकसन.
- ५) प्रमाण मराठीच्या नियमांचा लेखनामध्ये उपयोजन.

**Major in DSC Economics****B.A. (First Year) Subject : Economics****As Per NEP 2020 (With effect from the Year 2024-25)****Semester I****Paper Code : HECOCT1101 Paper Title : Indian Economy-I****Course Outcomes :**

1. Acquaint the students with structure of the Indian Economy and changes taking place therein.
2. Know the progress of Indian planning and policy frame work of Indian Economy.
3. Understand the problems of the Indian Economy i.e. , Unemployment, Poverty.
4. Get aware of challenges before Indian Economy and remedies for it.
5. Know about sector wise contribution in Indian Economy.
6. Able to formulate the strategy for the economic development in India.

**Paper Code : HECOCT1102, Title : Environmental Economics-I****Course Outcomes:**

1. Students will have full knowledge of the interrelationship between economy and environment and students will love the environment.
2. By educating the students about the environmental issue, they become aware of what to do for environmental conservation.
3. Students understand the importance of natural resources in human life and economy.



4. Students realize the importance of environmental education and social awareness for environmental conservation.

#### **Generic Elective**

**Paper Code : HECOGE1101 Title : Economic Planning**

#### **Course Outcomes:**

1. Describe and explain the process of Economic Planning.
2. Describe and examine the changing structure and planning process in India.
3. Describe and explain the relation between Economic Planning and Development.

#### **(Vocational & Skill Enhancement Course)**

**Paper Code: HECOSC1101 Title: Computer Applications in Economics**

#### **Course Outcomes:**

After study of this course, students will be able to:

Perform basic operations and data manipulation in MS Excel, including formulas, functions, sorting, and filtering. Apply measures of central tendencies and basic statistical techniques in MS Excel for economic analysis. Create visualizations and charts in MS Excel to represent economic data effectively. Utilize conditional formatting in MS Excel to highlight and analyze data patterns. Develop professional presentations in PowerPoint to communicate economic information. Demonstrate proficiency in writing, formatting, and organizing documents using MS Word.

#### **Indian Knowledge System**

**Semester-I Paper Code : IKSECO1101 Title : Pioneers of Indian Economic Thought**

#### **Course Outcomes:**

By the end of the course, students will be able to: Develop a foundational understanding of Kautilya's "Arthashastra."

- Page 36 of 53 Appreciate Mahatma Basaveshwara's influence in human capital development.
- Master key economic principles from Kautilya's teachings.
- Acquire in-depth knowledge of Mahatma Basaveshwara's economic philosophy.
- Evaluate Chatrapati Shivaji Maharaj's 17th-century economic strategies.
- Recognize the transformative impact of Mahatma Phule's contributions.
- Understand socio-economic initiatives by Chatrapati Shahu Maharaj.
- Gain familiarity with Mahatma Gandhi's economic ideas.
- Analyze Dr. Babasaheb Ambedkar's economic theories and principles.
- Appreciate Dr. Anna Bhau Sathé's perspectives on poverty, economic equity, and other issues. Understand the contributions of Amartya Sen and Abhijit Banerjee to economics.
- Grasp Amartya Sen's capability approach and Abhijit Banerjee's work on antipoverty programs.

#### **Semester - II**

**Paper Code : HECOCT1151 Paper Title : Indian Economy-II**

#### **Course Outcomes :**

At the end of the course the students should be able to :

- 1) Acquaint the students with structure of the Indian Economy and changes taking place therein.



- 2) Know the progress of Indian planning and policy frame work of Indian Economy.
- 3) Understand the problems of the Indian Economy i.e. Population, Unemployment, Poverty.
- 4) Get aware of challenges before Indian Economy and remedies for it.
- 5) Know about sector wise contribution in Indian Economy.
- 6) Able to formulate the strategy for the economic development in India. 7) Able to evaluate impact of LPG policies on economic growth in India.

**Paper Code : HECOCT1152, Title : Environmental Economics-II**

**Course Outcomes :**

1. It will be realized that the development done by degrading the environ dangerous.
2. Biodiversity ecosystem, ecological genera and bio chain will create self-awareness among the students and will inspire them to protect the environment.

**Course Code: HECOGE1151 Title of the Course : Economy of Marathwada**

**Course outcomes:**

1. Students will have gained a clear understanding of the actual causes behind the backwardness of the Marathwada Region.
2. Students will understand the reasons behind the low agricultural development Marathwada Region.
3. Students will understand the reasons behind the stagnation / low growth of industrial and service sectors in Marathwada Region
4. Students will debate and practice potential solutions for the development of Marathwada Region.

**Vocational Skill Enhancement Course**

**Paper Code : HECOSC1151 Title : Economics of Tourism**

**Corse Outcomes:**

By the end of the course, students will be able to: Understand and explain the economic aspects of tourism, including its meaning, scope, and various types.

- Recognize the contribution of tourism to the national economy, specifically its imp GDP and its importance in India and Maharashtra.
- Analyze tourism demand, identify different types of tourism demand, and comprthe determinants influencing tourism demand.
- Define and discuss tourism supply, comprehend its market structure, and understatrends shaping the supply in the tourism industry.
- Gain knowledge about e-marketing in tourism, including its introduction, meaninits role in promoting tourism products and services.
- Identify and evaluate customer satisfaction strategies employed by airlines, hresorts, homestays, travel agencies, and online reservation systems.
- Understand the challenges faced in e-marketing within the tourism industry and destrategies to overcome them.
- Comprehend the importance of tourism policy and planning, including invesopportunities and government policies related to the economics of tourism.
- Familiarize themselves with the National Tourism Policy of 1982 and 2002, recogits significance in shaping the tourism industry.



- Acquire knowledge about travel documentation requirements, including passports, health certificates, and travel insurance for tourists.

### **BASY SEM- III**

#### **ECO V Macro Economics - I (Compulsory)**

This course aims to develop the broad conceptual frameworks, which will enable students to understand and comment upon real economic issues like inflation, money supply, GDP and their inter linkages

#### **ECO VI Quantitative Techniques –I ( Opt.)**

The course is helpful to study other branches of economics and research. The course will be useful for the students to understand data analysis, estimation and inference since the course is best on the techniques of statistics.

#### **Economics of Development ( Opt.)**

1. Course will be useful in understanding the concept of development from many dimensions.
2. Learners will be aware of the different approaches towards development.
3. Course will be useful in understanding different government scheme in the process of economic development .
4. Course enables learners with the current scenario of development among different countries.

#### **SEC-I Cashless Transactions**

- Discuss Banking systems inexistence and how they are structured
- Explain the relative importance of new modes of payments (cashless) in transactions.
- Discuss the main types of cashless instruments and the main techniques employed by banks.

### **BASY Semester III**

#### **ECONOMICS**

#### **VII Macro Economics - II (Compulsory)**

This course aims to develop the broad conceptual frameworks, which will enable students to understand and comment upon real economic issues like employment and multiplier, acceleration, banking system, open economy, and their inter linkages. It will also allow the students to evaluate various macroeconomic policies in terms of a coherent logical structure.

#### **ECO VIII Quantitative Techniques -II ( Opt.)**

1. Students will get knowledge about how the value of money is decided.
2. Students will study price differentiation between base year and current year.
3. Students will study the change in economic factors in course of times.
4. Students will study the economic & social trend with the help of moving average method.

#### **Economics of Development and Environment. ( Opt.)**

1. Students would understand the Environmental Concept.
2. Students will know the role of environment in the process of development.
3. Students will have an idea about sustainable development & natural resource management.
4. Learners will be familiar with the concept and theories of welfare.

#### **SEC - II Data Collection**

On completion of the course, the student shall be able to



- Demonstrate his/her understanding of sampling methods and the ability to use collection of data
- Identify the appropriate sample techniques for different kinds of research questions
- Identify the appropriate source of data in relation to the collection of research data.
- Able to classify and present the collected data in the form of graph, bar diagram, chart etc.

#### **BASY SEM- IV**

##### **DSE-ECO IX History of Economic Thoughts – I (Optional )**

1. Pupils will understand the basic economic concepts by studying the course.
2. Students will be able to solve the economic problems by studying this course.
3. Students will acquire the judgment power by studying the comparative approach.

##### **Mathematical Economics – I ( Optional )**

1. Students will understand basic economic concept with the help of this course.
2. This course is important to prepare the background for the post graduate course in Economics.
3. Student who study this course will be eligible for MBA course in the future.
4. This course will be useful for preparation of competitive exam.
5. With the help of this course, the basic economic concept of the student will become clearer.

##### **Industrial Economics ( Optional )**

1. The students will know why the entrepreneurs choose specific locations to establish the Industries.
2. The students will aware about the importance of MNCs in Indian Industrial Economy
3. The students will get knowledge of some large industries, agro based and small scale Industries.
4. The students will learn about the changes in Industrial Policy of India

##### **GE-ECO X Indian Economy (Compulsory)**

1. Student will acquire the knowledge of Indian Economy.
2. Student will understand various challenges of Indian Economy.
3. Student will be able to suggest various measures to policy makers for solution of economic problem.

##### **SEC III Financial Inclusion and Financial Literacy**

- Completed the essential reading and activities students Should able to :
- Student will be able to create their own financial plan.
- Student will be able to create their own budget. Student will propose a personal saving and Investment plan.
- Student will be examining how their choice of carrier and lifestyles will affect their financial plan.
- Student will be aware about financial inclusion and financial literacy.
- Student face a challenging economical future.

##### **DSE-ECO XI History of Economic Thoughts – II (Optional)**



1. Agricultural Entrepreneurship will be adopted by pupils.
2. Students will get knowledge of the exploitation of Indian Economy in the British rule.
3. Students will know how much the political Leadership is successful in solving the economic problems of the society.
4. The students will know the importance of Eastern Economic Ideas on the world level.

#### **Mathematical Economics – II (Optional)**

1. Students will understand basic economic concept with the help of this course.
2. This course is important to prepare the background for the post graduate course in Economics.
3. Student who study this course will be eligible for MBA course in the future.
4. This course will be useful for preparation of competitive exam.
5. With the help of this course, the basic economic concept of the student will become clearer.

#### **International Economics (Optional)**

International Economics is an exciting and dynamic subject that equips students with the tools which to tackle important real world issues in this age of globalization and financial integration.

#### **GE-ECO XII Public Finance (Compulsory)**

1. Student will able to analyze different concept of public finance.
2. The student will understand the imbalance between public revenue and public expenditure.
3. The students will suggest various measures to decrease deficit.
4. The student will be able to evaluate working of recent finance commission.

#### **SEC IV Entrepreneurship Development**

On completion of the course, the student shall be able to :

- Understand the concept of entrepreneurship and its functions. The student will also be able to describe the process of entrepreneurship.
- Explain the competencies of an entrepreneur.
- Understand the meaning and ways of generating ideas and able to prepare a business plan.
- Understand the reasons for success and failure of a business plan. Identify the various support structure available for promoting entrepreneurship

### **Major in DSC HISTORY**

#### **B.A. (First Year) Subject : History**

**As Per NEP 2020 (With effect from the Year 2024-25)**

#### **Semester-I & II Paper Title: History of Ancient India**

##### **Course outcomes**

1. Students will acquire a comprehensive knowledge and understanding of the major ancient Indian civilizations, including the Indus Valley Civilization, Vedic age, Mauryan Empire, Gupta Empire. They will learn about the social, political, economic, and cultural aspects of these civilizations.
2. Students will become familiar with key historical events and developments that shaped ancient Indian history. They will gain an understanding of significant battles, political





transitions, religious and philosophical movements, and other transformative events in ancient Indian society.

3. Students will develop an appreciation for the cultural and religious diversity that existed in Ancient India. They will gain insights into the beliefs, practices, and artistic expressions of ancient Indian societies, including their religious rituals, literature, architecture, and visual arts.

4. Students will gain a contextual understanding of ancient Indian history by exploring the social, political, economic, and geographic factors that influenced the development of ancient Indian civilizations

### **Paper Title: History of Maratha Power (1630-1673 AD)**

#### **Course outcomes**

1. Students will acquire a comprehensive knowledge and understanding of the life, achievements, and reign of Shivaji Maharaj. They will develop a detailed understanding of his early years, military campaigns, administrative reforms, and his role in establishing the Maratha Empire.

2. Students will gain a deeper understanding of the socio-political context in which Shivaji Maharaj operated. They will learn about the political landscape of medieval India, including the Mughal Empire, the Deccan Sultanates, and other regional powers, and how Shivaji Maharaj navigated these dynamics.

3. Students will explore the administrative reforms introduced by Shivaji Maharaj. They will analyze the decentralized administrative system, revenue administration, justice administration, and policies promoting religious tolerance.

4. Students will engage in comparative studies by analyzing Shivaji Maharaj's reign in relation to other contemporary and preceding rulers and empires. They will understand the different historiographical perspectives on Shivaji Maharaj and his legacy, and evaluate the influence of political, social, and cultural factors on historical interpretations.

### **Paper Title: Social Reformers in Maharashtra (Generic Elective) (GE)**

#### **Course Outcomes**

1. Students will gain a thorough understanding of the lives, contributions, and ideologies of prominent social reformers of Maharashtra. They will be able to identify key reformers and their significant role in shaping the social, cultural, and political landscape of Maharashtra.

2. Students will develop a deeper appreciation for the historical and cultural context in which social reforms took place in Maharashtra. They will gain insights into the social challenges prevalent during different periods and understand how social reformers responded to these challenges.

3. Students will gain a comprehensive understanding of various social issues prevalent in Maharashtra, such as caste discrimination, women's rights, education, and social inequalities. They will explore the transformative reforms initiated by social reformers in these areas and evaluate their outcomes.

4. The paper aims to inspire students to develop a sense of social responsibility and engagement. By learning about the struggles, achievements, and perseverance of social



reformers, students will be motivated to actively participate in social causes and contribute to positive change in their communities.

**Paper Code- HHISSC1101 Paper Title: Tourism (SEC)**

**Course outcomes**

1. Students will understand about conservation of tourist places.
2. Students will be able for their vocational career through Tourism.
3. Students have jobs in MTDC and ITDC. 4. Students will help to conserve tourist places nearby

**BASY Semester III and IV**

**CCHISI V and VII-Chhatrapati Shivaji and His Times (1630A.D. to 1707 A.D.)**

**Course Outcomes:**

- 1) It will help the students to understand the most important and inspiring history of Medieval Maharashtra.
- 2) It will help the students to understand the political and administration of this period.
- 3) It will aware the students about various policies regarding Agriculture, Water management, Environment and Scientific approach of Chhatrapati Shivaji Maharaj.
- 4) The students will study the process of Mughal kings and British Governors.

**CCHISII VI and VIII- History of India (1526A.D. to 1707 A.D.)**

**Course Outcomes:**

- 1) This paper will help students to know the expansion of Mughal Empire.
- 2) The Students will know about the great kings in this period.
- 3) The Students will study the governor Generals policy.
- 4) The students will study the process of Mughal kings and British Governors

**SEC I and II Tourism**

- 1) To enhance the views regarding the Indian Tourism.
- 2) To enrich the understanding of the students with reference to creative sites for Tourist.
- 3) To enable the students for their vocational careers.
- 4) To get jobs in Tourism Department and Tourism Industries.
- 5) To conserve the historical Monuments and places in their local areas.

**BATY Semester V and VI**

**DSE HIS-I and II P IX and XI History of Modern India (1857A.D. to 1947 A.D.)**

**Course Outcomes:**

1. To enhance the national interest among the students.
2. To support the spirit of competency.
3. To inculcate the National and International virtues in the minds of students.
4. To enlighten the spirit of fellow feeling.
5. To elaborate the Modern Indian History in various contexts.

**OR Landmarks of World History****Course Outcomes:**

1. The students will perceive the great revolutions like American Revolution, French Revolution, & Russian revolution.
2. Students will study the social and economical changes in the world history.
3. Student will understand the relations between the nations in the world.
4. Students will streamline the role of League of Nations and U.N.O.
5. Students understand the consequences of the First and the Second World War regarding the present global crises.

**DGE HIS-II and IV P X and XII****Social Reformers in Maharashtra & Awakening Movements****Course Outcomes:**

1. The students will perceive the great revolutions like American Revolution, French Revolution, & Russian revolution.
2. Students will study the social and economical changes in the world history.
3. Student will understand the relations between the nations in the world.
4. Students will streamline the role of League of Nations and U.N.O.
5. Students understand the consequences of the First and the Second World War regarding the present global crises.

**SEC III Appreciation of Indian Art****Course Outcomes:**

1. To enhance the views regarding the Indian Art.
2. To enrich the historical understanding of the students with reference to creative arts.
3. To enable the students for their vocational careers.
4. To get jobs in Archaeology Department and Tourism Industries.
5. To conserve the historical Monuments and places in their local areas.

**Major in DSC Political Science****B.A. (First Year) Subject : POLITICAL SCIENCE****As Per NEP 2020 (With effect from the Year 2024-25)****B.A. First Year****NEP 2020 Revised Syllabus (Effect from Academic Year 2024-25)****Semester-I****Paper Code: HPOLCT3101, Title Understanding Political Theory I****Course out comes:**

1. The nature and relevance of Political Theory
2. The different concepts like State, Government & Sovereignty.
3. To reflect upon some of the important debates in Political Theory

**Paper Code: HPOLCT3102 Title-Govt. & Politics of Maharashtra II****Course Outcomes:**

1. The formation process of Maharashtra State
2. Students get various political ideas concern with State Government and other Political Issues
3. Students will understand political system of Maharashtra



**Generic Elective Course (GE) Paper Code: HPOLGE3101, Title- Legislative Procedures and Practices**

**Course Outcomes:**

- 1.To help students in understanding the practical approaches to legislative practices and procedures,
- 2.To make students understand the procedures and processes related to drafting a Bill and the passage of the Bill,
3. To enable students to have an understanding of the importance of legislative Committees,
4. To make students learn about the basic functioning of legislative.
5. Aim at understanding the procedural aspects of legislative system of governments.
6. Learn about the privileges of representatives and match it with their performance.
7. Understand the working of committees, budgetary aspects and deliberative mechanism within the Parliament.

**SEC Paper Code: HPOLSC3101 Title-Political Leadership**

**Course Outcomes:**

1. After studying this course, students will be able to have a professional/ career oriented insight by facilitating their journey as Political Leader, Media managers, policy makers, political analysts, Journalists, Public relations officers in government agencies, political parties and higher education.

**Semester-II**

**Paper Code: HPOLCT3151 Title Understanding Political Theory**

**Course Outcomes:**

1. The nature and relevance of Democracy & Citizenship.
2. The different concepts like Liberty, Justice and Equality.
3. To reflect upon some of the important debates in Political Theory.

**Paper Code: HPOLCT3152 Title Govt. & Politics of Maharashtra**

**Course Outcomes:**

1. The nature and relevance of local Political system in Maharashtra.
2. Students will help to understand the Urbanization & its Problems.
3. Students increase his knowledge about Political Party & its activity.

**Generic Elective Course (GE)**

**Paper Code: HPOLGE3151 Title-Electoral Politics & Voting Behavior**

**Course Outcomes:**

1. Students will be able to understand how the Election Commission works, what rules and regulations are in Place during an election, and some important elections that have taken place.
2. Students will understand and analyze the role of the media in the election process in India, critically analyze and debate on the process of Political Advertising, and understand how Psychology works during elections and what career options it can offer.

**SEC Paper Code: HPOLSC3151 Title-Political Reporting**

**Course Outcomes:**

1. Students who undertake this course and participate fully can expect to gain a thorough knowledge of the



2. Students will be able to understand the nature of news and the process of news transmission to the readers.
3. Students will be able to write news stories and comprehend the role of the press in a democratic society.
4. Understand the need, scope and concepts in Political Reporting.
5. Identify various sources for Political Reporting

### **BASY SEM- III**

#### **Political Science:**

##### **V Indian Government And Politics**

The outcome of course lies in building ideal citizens competition ready skilled, man power mass awareness about the political structure and functionary among the youth. It will also go a long way in building Democracy and mass awareness among with about Indian Constitutions with their Fundamental Rights and Duties.

##### **POL. SCI. VI International Relations**

The Utility of the course Lies in the course Constitution in raising the students awareness about the global International Politics with Key concepts approaches and Political Institutions like UNO. It will also helps students to prepare themselves for competitive exams like UPSC, MPSC etc. moreover it will career like Political analyst Media, Professionals and Ideal Politicians.

##### **SEC I Basic Information and Preparation Skills for Competitive Examination – I**

It will help students to eradicate fear of competitive examinations. 2. Pupils will develop skills to pass the competitive examination. 3. Students will know that acquisition of knowledge is a matter of vast study and voracious reading. 4. Students will understand the difference and co-ordination between legislature and bureaucracy.

### **BASY SEM- IV**

##### **POL. SCI. VII Indian Government And Politics**

The outcome of course lies in building ideal citizens competition ready skilled, man power mass awareness about the political structure and functionary among the youth. It will also go a long way in building Democracy and mass awareness among with about Indian Constitutions with their Fundamental Rights and Duties.

##### **POL. SCI. VIII International Relations**

The Utility of the course Lies in the course Constitution in raising the students awareness about the global International Politics with Key concepts approaches and Political Institutions like UNO. It will also helps students to prepare themselves for competitive exams like UPSC, MPSC etc. moreover it will career like Political analyst Media, Professionals and Ideal Politicians.



## **SEC II Basic Information and Preparation Skills for Competitive Examination – II**

1. It will help students to eradicate fear of competitive examinations.
2. Pupils will develop skills to pass the competitive examination.
3. Students will know that acquisition of knowledge is a matter of vast study and voracious reading.
4. Students will understand the difference and co-ordination between legislature and bureaucracy.

## **BATY Semester V**

### **SEM-V DSE- POL SCI IX Indian Political Thought OR India's Foreign Policy**

#### **Course Outcomes:**

This course will encourage students to understand and decipher the diverse and often contesting ways in which the ideas of nationalism, democracy and social transformation were discussed in Pre and Post-independence India.

### **GE-POL SCI X Western Political Thinker**

#### **Course Outcomes:**

The course will narrate students the legacy of the thinkers and orient them about continuity and change within the western political tradition. It helps them to study historical aspects western state and society.

### **SEC III Indian Parliamentary Procedure**

#### **Course Outcomes:**

The main purpose of this course is to encourage learner for absorbing the skill to solve issues, problems in their day to day life as parliament do for the sake of save and strength then democracy.

## **BATY Semester VI**

### **SEM-VI DSE- POL SCI XI Political Ideology**

#### **Course Outcomes:**

This paper will acknowledge students with various classical political ideologies and its contemporary relevance.

**Or**

### **Political Sociology**

#### **Course Outcomes:**

This course will helpful learners to understand dynamics within political action, power and process in India and across the country.

### **GE-POL SCI XII Modern Political Analysis**

#### **Course Outcomes:**

This paper content will helpful for student to draw new meaning as per recent time they can understand new concept of political science in the reference of modern age.



## **SEC IV Indian Democracy & Good Governance**

### **Course Outcomes:**

This Course will helpful and encourage students to Acknowledge Democratic Process in India.

## **Major in DSC PUBLIC ADMINISTRATION**

### **Public Administration (As per NEP-2020)**

### **B.A. First Year (Effective from Academic year 2023 – 2024)**

#### **Semester-I**

#### **Paper Code: HPUBCT1101 Title: Introduction to public Administration**

#### **Course outcomes:**

1. Students will understand the Evolution and importance of Public Administration.
2. Students will understand the basic knowledge of discipline.
3. Students will understand new concept and roles of Public Administration.

#### **Paper Code: HPUBCT1102 Title: Indian Constitution & Administration-II**

#### **Course Outcomes:**

1. It will be Possible to understand the importance of Constitution of Indian as a fundamental law.
2. Exercise his fundamental rights in proper sense at the same time identifies his responsibilities in national building.
3. Students will become responsible Citizens of India.

#### **Paper Code: HPUBGE1101**

#### **Title: E-Administration-I Generic Elective course (GE)**

#### **Course outcomes:**

1. To learn students about the basic elements of E-Administration.
2. It will provide knowledge of E-devices in Public Administration.
3. Students will Aware of the basic knowledge of E- administrative system as well as various issues in E-Administration.

#### **Skill Enhancement Course (SEC) In Public Administration**

#### **Paper Code: HPUBSC1101 Title: Personality Development & Communication Skills-I**

#### **Course outcomes**

1. Students will acquire theoretical knowledge of concepts such as personality, skills, values, communication, motivation and leadership
2. Students will develop self-understanding based on theoretical understanding of personality, skills, values, communication, motivation and leadership.
3. It will help to acquire attitude, manners and communication skills necessary for rational decision making.



## Semester-II

**Paper Code: HPUBCT1151 Title: Principles of Administrative organization-III**

### Course outcomes:

1. The importance of organization in human life will be realized.
2. Theories, approaches, concepts and principles of public administration will be studied.
3. Understand the role of the Chief Executive in public administration.
4. Understanding the functions of line and staff agencies 5. The department and its basic components can be studied.

**Paper Code: HPUBCT1152 Title: Indian Administrative system-IV**

### Course outcomes:

1. Understand the form and substance of Indian Administration
2. Learn the significance of Indian Parliament.
3. Acquaint with the functioning of the Indian administration, at central levels and the responses of these systems in addressing the concerns of the people
4. Analyze the executive role of Constitutional Bodies

### Generic Elective course (GE)

**Paper Code: HPUBGE1151 Title: Administration of Non-Government Organizations-II**

### Course outcomes:

1. Understand the concept of NGO, its types and registration procedure.
2. Ability to critically analyze challenges faced by NGOs.
3. Develop Knowledge & skills with regards to fund raise strategies.
4. Analyze the various schemes provided by the government.
5. Understand the process of projects and its management.

### Skill Enhancement Course (SEC) In Public Administration

**Paper Code: HPUBSC1151 Title: Leadership Styles and Conflict Management-II**

### Course Outcomes:

1. Understand the different styles of leadership given by administrative thinkers.
2. They will also understand the causes and level of conflicts in an organization.
3. Students will also be able to understand the handling of inter-personal conflict
4. Describe a leader's role in managing conflict in the Organization
5. Understand how to turn conflict into an opportunity for redemption and reconciliation.

### BAFY- SEM-I CBCS Pattern (Till Academic Year 2023-24)

#### CCPA- Basic Principles of Public Administration

- 1) Students will get knowledge of Public Administration.
- 2) They will get knowledge of the new trends in public administration
- 3) Student will understand relations of public administration with other humanities

#### CCPA- District Administration

1. Student will understand District Administration.
2. Student will understand Structure and function of various Administrative offices of District Administration.
3. They will get knowledge of the Revenue Administration, Police administration and Judiciary system at district and taluka level.





### **BASY SEM-III**

#### **CCPA-I V Personnel Administration**

##### **Course Outcomes:**

1. It will provide knowledge of Personnel Administration.
2. Explain the importance of human resources and their effective work in Administration
3. Outline the principles of recruitment and the advantages and disadvantages of Direct & Indirect Recruitment
4. Analyze the key issues related to Promotion , Merit & Seniority principle etc.

#### **CCPA-II VI Rural Local Government**

##### **Course Outcomes:**

1. Develop a rural local leadership.
2. Awareness of the basic governing system as well as development measures.
3. It will provide knowledge of Three tier system of Panchayati Raj in Maharashtra state.
4. Understand the role of Panchyat Raj Institutes as the main instrument of State to achieve its Rural developmental goals.

#### **SECPA-I I E-Administration**

##### **Course Outcomes:**

1. The course will help to the students learn about the basic elements of E-Administration.
2. It will provide knowledge of E-devices in Public Administration.
3. Awareness of the basic E- administrative system as well as various issues in E-administration

#### **CCPA-III VII Financial Administration**

##### **Course Outcomes:**

1. Awareness of the basic financial system as well as development measures.
2. Explain the importance of Budget and Financial Administration.
3. Analyze the various issues related to Indian Budget.
4. Understand the role of Finance Administration as the main source of development.

#### **CCPA-IV VII I Urban Local Government**

##### **Course Outcomes:**

1. It help the students Conceptualize about the developmental process as nations develop cities grow, and how planning is done & implemented in a bottom – to- top approach.
2. Awareness of the basic governing system ( Urban) as well as development measures.
3. Exhibit the efforts for urban development in Maharashtra state.

#### **SECPA-II II Administrative Skill**

##### **Course Outcomes:**

- 1) The course will aid the students to develop their personality..
- 2) It will introduce them about the functioning of the Administrator in Public Administration.
- 3) It will make the students aware of the various issues in Public Administration .

### **BASY Semester IV**

#### **DSEPAI IX Indian Administrative Thinkers**

##### **Course Outcomes:**

1. Students will get knowledge useful for competitive exams like UPSC, MPSC and other Exams



2. Students will study basic concepts and political institutions like Parliament, Supreme Court, Political Parties Constitution and Democracy etc.
3. Students will come to know the administrative and Political setup and Mechanism with roll and functions.
4. It will be helpful to develop sensitive citizenship among the students

### **DGEPA -I X Indian Administration**

#### **Course Outcomes:**

1. . Students will get knowledge useful for competitive exams like UPSC, MPSC and other Exams
2. Students will study Key Political concepts like, power diplomacy, propaganda, International Law, UNO National Interest, National Power, Disarmament etc
3. Students will come to know the basic of International Relations.
4. Students will be ready for different carriers like Political analyst, Politicians, Media, Professionals and Sensitive Citizens.

### **B.A. Third Year Semester – V**

#### **DSEPA-I Indian Administrative Thinkers-IX**

#### **Course Outcomes:**

- 1) Students will acquire basic Knowledge of various Indian Administrative Thoughts.
- 2) Students will approaches to study of Rural Development.
- 3) Students will understand the Administrative system of period of Chhatrapati Shivaji Maharaj.

### **DGEPA-I**

#### **Indian Administration-X**

#### **Course Outcomes:**

- 1) Students will understand the Administrative system of India
- 2) Students will be able to identify various silent features of Indian Administration.
- 3) Students will be able introduce the Historical background of Indian Administration.

**Or**

### **DGEPA-I**

#### **Office Administration-X**

#### **Course Outcomes:**

1. Students will understand the meaning of Office Administration.
2. Students will be able to acquire knowledge of the Office Procedure and Method.
3. Students will be able to identify various problems in Office Administration.

### **SECPA -III SEC III Disaster Management**

- 1) Students will get acquainted to the knowledge of Disaster Management
- 2) Students will understand the role of various factors in Disaster Management.

### **B.A. Third Year**

**(Semester :-VI )**

### **Subject :- Public Administration**

#### **Paper No:- DSEPA:-II (OR) Western Administrative Thinkers-XI**

#### **Course Outcomes:**

- 1) Students will be provided with basic Knowledge of administrative theories.



- 2) Students will understand the western Administrative theory.
- 3) Students will be familiarized with basic Knowledge of modern administrative thoughts.

**Paper No: - DGEPA: - II Indian Constitution & Administration-XII**

**Course Outcomes:**

- 1) Students will understand the formation of Indian Constitution.
- 2) Students will identify the Role of various Constitutional & Other National Bodies.
- 3) Students will know the fundamental Rights and Duties of Citizen.

**(Or)**

**Paper No:- DSEPA:-II Recent Trends in Public Administration-XI(Or)**

**Course Outcomes:**

- 1) Students will understand the emerging and recent trends in public administration.
- 2) Students will know the Importance of Information Technology in Public Administration.
- 3) Students will get introduced and provide acquired knowledge of Right to Information Act.

**Paper No :- SECPA :- IV Administration of Non-Government Organizations**

**Course Outcomes:**

- 1) Students will Provide Knowledge of Non Government Organization and their Administration.
- 2) Students will understand the work of N.G.Os in Nation building.
- 3) Students will be able to understand the Non Government organization and its works.

**Major in DSC Sociology (As per NEP-2020)**

**B.A. First Year (Effective from Academic year 2023 – 2024)**

**Semester-I**

**Paper Code: HSOCCT3101 Title: INTRODUCTION TO SOCIOLOGY (Major/Minor)**

**Course Outcomes:**

1. Student will be able to demonstrate on understanding of how social call affects individual life.
2. To understand society in context of the sociology theory: knowledge concepts.
3. To acquire domain interdisciplinary knowledge through discipline of Sociology.

**Paper Code : HSOCCT3102 Title-New Changes in Social Institution-II(Major/Minor)**

**Course Outcomes:**

1. Students will obtain a sociological understanding of diverse: social groups: organization and social institutions.
2. Social institutions are usually conceived of as the basic focuses of social organization: common to all societies.
3. To acquire domain interdisciplinary knowledge through discipline of Sociology.

**Generic Elective Course (GE) Paper Code: HSOCGE3101 Title: Indian Rural Sociology**

**Course Outcomes:**

1. Importance of rural sociology in agricultural extension and interrelationship & with processes.
2. This course explores social life along the rural community and also provides a broad introduction to be issues and perspectives in rural sociology.
3. To acquire domain interdisciplinary knowledge through discipline of Sociology



**SEC Paper Code: HSOCSC3101 Title: Personality Development**

**Course Outcomes:**

1. Personality Development course will polish students about presentation and communication skill and prepare to successful career.
2. Student will Apply the understanding of communication skill into everyday practice and under- standing the importance of human life.
3. To acquire domain interdisciplinary knowledge through discipline of Sociology

**Semester-II**

**Paper Code: HSOCCT3151 Title: Basic Concept in Sociology**

**Course Outcomes:**

1. To understand the basic concepts in sociology and their fundamental theoretical interrelationship: 2. students will be able define: gives examples: show interrelationships and demonstrate the relevance.
3. Students will be able to know the basic knowledge of sociology.
4. To acquire domain interdisciplinary knowledge through discipline of Sociology.

**Paper Code: HSOCCT3152 Title: Contemporary Social Institutions**

**Course Outcomes:**

1. Institutions can refer to mechanism of social order: which govern the behavior of set of individuals within a given community.
2. Moreover: institutions are identified with social purpose: transcending individuals and intention by mediating the rules that govern living behavior. Debates about the social impact of sociology have been historically centered.
3. To acquire domain interdisciplinary knowledge through discipline of Sociology.

**Generic Elective Course (GE) Paper Code: HSOCGE3151 Title: Health and Society**

**Course Outcomes:**

1. The individuals health conditions, reactions to sickness and ill health, as well as the effects of care and treatment.
2. Measure that help people experience a sense of hope and safety , as well as physical, mental , and social wellbeing.
3. Students Understand Concept of Illness, Sick Role, Disease, and Epidemiology. Discusses about Community Health, Meaning of Community Health.
4. To acquire domain interdisciplinary knowledge through discipline of Sociology

**Paper Code: HSOCSC3151 Title: NGO Management and Social Development**

**Course Outcomes:**

1. Students should enrich their knowledge about NGO Management.
2. Students enrich their knowledge about project management dimensions, planning and it's implementation.
3. To enrich skills and techniques of project evaluation.
4. To acquire domain interdisciplinary knowledge through discipline of Sociology.



**B.A. Second Year  
(Semester - III)**

**(CBCS Pattern Syllabus) V - Indian Society: Structure and Change**

**Course Outcomes:**

Sociologists are typically motivated by the desire to better understand the principles of social life and by the conviction that understanding these principles may aid in the formulation of enlightened and effective social policy. India is a land of diverse religions. Social Structure of India underwent some changes. The Indian society in the recent past, particularly since the Independence. There are two main forms of social stratification caste and class both are the agencies of social mobility and selection. They decided largely the position that man occupies in society. Democracy is very much linked with modernization. Secularism and National integration are soul of India. This course gives insights about social change in India

**VI - Human Rights and Social Justice**

**Course Outcomes:**

Principles of human rights are fundamental rights. Justice is the concept of fairness. Social Justice and human rights have a shared goal human dignity, equally for all. The issues that make social justice difficult to achieve, such as poverty, exclusion and discrimination are in direct contradiction with human rights, which apply to all individuals indiscriminately. Human rights can help to fight indignity. In addition to promoting equality generally human rights protect against direct and indirect discrimination based on certain characteristics. Human rights provide legal framework that allows individuals to hold government to account and requires the state to create conditions necessary for the achievement for social justice.

**(SEC-I) Personality Development**

Personality Development course will polish students presentation and communication skill and proper to successful career. Apply the understanding of communication skill into everyday practice and understanding the importance of human life.

**(Semester - IV)**

**(CBCS Pattern Syllabus) VII - Issues and Problems in Indian Society**

**Course Outcomes:**

Thomas Pen addresses the individual's duty to "allow the same right to other as we allow ourselves." A social issue is a problem that influences many citizens within a society and one that many people strive to solve. It is often the consequence of factors extending beyond an individual's. After studying this course students should be able to illustrate what is a social issue about social science. Demonstrate how certain social contradictions become dominant. Distinguish how labelling something can create expectation about behaviour and action.

**B .Com. (Bachelor of Commerce)**

**Program outcomes:**

Our college is affiliated to Swami Ramanand Teerth marathwada University, Nanded. This college offers B Com under graduate level. The university has not designed the programme outcomes in its curriculum. However the college has designed, based on the subjects offered, the following programme outcomes of the B Com programme.



1. B.Com. graduates can pursue Post Graduate Studies like M.Com., MBA, MCA, ICWA, ISCI, etc.
2. B. Com students can choose Career Options like , Chartered Accountancy, Banking Services, Insurance Sectors, Marketing, Company Secretaryship, Stock Exchange Services, Tax Consultancy, Management & Planning, Entrepreneurship, Law etc.
3. They are eligible to appear for any competitive exams conducted by Union Public Service Commission (UPSC), Maharashtra Public Service Commission (MPSC), Indian Railway Board, etc for entering into the government services.
4. The B.Com. graduate students can pursue B.Ed. course and opt teaching career in the schools.
5. After completing three years for Bachelors in Commerce (B.Com) program, students would gain a thorough grounding in the fundamentals of Commerce and Finance.
6. The commerce and finance focused curriculum offers a number of specializations and practical exposures which would equip the student to face the modern-day challenges in commerce and business.
7. The all-inclusive outlook of the course offer a number of value based and job oriented courses ensures that students are trained into up-to-date.

**B. Com. I Year: Semester I (Level 4.5)**

**Effective from Academic Year 2024 – 2025 (As per NEP-2020)**

**B.Com. I Year: Semester I (Level 4.5)**

**Subject: Commerce Under Faculty of Commerce and Management**

**Course Title: Financial Accounting-I Discipline Specific Core (DSC) Major**

Course Code: CCOMCT1101

**Course Outcomes**

1. Students will be able to understand the accounting standards and process from journal to trial balance.
2. Students will be able to identify the various types of errors and rectify them.
3. Students will be able to prepare final accounts of sole trading concern.
4. Students will be able to understand consignment business and its accounting.

**Course Title: Business Economics-I Discipline Specific Minor 1 (DSM)**

**Course Code: CCOMMT1101**

**Course Outcomes:**

1. Students will be acquainted with the principles and theories of economics as are applicable in business.
2. Students will be able to utilize the concept of utility, indifference analysis and consumer surplus etc.
3. Students will be able to apply various economic principles and theories as are applicable in business production
4. Students will be able to apply economic reasoning to solve business problems.
5. Students will be able to apply costing theory to solve business problems.

**B.Com. Second Year Syllabus**

**Semester III (CBCS Patterns)**

**Paper No. BC.3.1 Corporate Accounting**

**Course Outcomes:**

1. The course is beneficial to understand the provision of company act 1956 regarding the preparation of accounts.
2. It is beneficial for students to move in to advance areas i.e. C.A, I.C.W.A, CS etc
3. It could help graduates to work as financial analyst, HRM officers.
4. It provides the knowledge of differentiating the profit Prior and post Incorporation.
5. It provides the basic concept of knowledge of buyback, forfeiture of shares.

**Semester III (CBCS Patterns)****Paper No. BC.3.2 Cost Accounting****Course Outcomes:**

On completion of this course students will be capable for

1. The selection of the appropriate cost accounting and their impact on the business policy.
2. The determination of cost as per element per unit of production.
3. The Identification and control of cost of production.
4. Becoming a superior Cost accountant and cost analyst.

**Semester III (CBCS Patterns)****Paper No. BC.3.3 Principles of Business Management****Course Outcomes:**

1. Successfully completion of this course, students will be able to understand the Managerial functions.
2. To understand the way of implementation of the planning process within the organization.
3. It would help the students to clarify the basic and fundamental concepts of the management systems.
4. To illustrate the ability to directly leading and communicating effectively.
5. It would be useful for analysing, evaluating and synthesizing the information of management

**Paper No. BC.3.4 Mercantile Law****Course outcomes:**

Students will be able to apply and follow the rules and regulations as per the various business and mercantile laws.

**Paper No. BC.3.5 Fundamentals of Income Tax****Course Outcomes:**

1. After Completion of course students will be capable to describe the provisions in the corporate taxlaw which can be used for tax planning.
2. Students can well define the residential status of the assets.
3. Student of the course will be able to explain different type of income of their tax liabilities, expenses and their deduction ability.
4. Students who complete their course will be able to learn various direct and indirect taxes and their implications
5. Students of the course will be able to state the use of various deduction to reduce the taxable income.
6. Student will be capable of choosing a career to become a Tax consultant.

**Skill Enhancement Course -I**

**Paper No. SEC.1.1 Management Skills**

**Outcomes:** After acquired the skills of management students be capable

- 1 Improve the technical skill and ability
- 2 students can develop his analytical ability & competent use of tool, work resolved the solve the problems
- 3 It help to coordinate and resolved the conflict within organizations
- 4 It can develop the team work
- 5 It help to develop integrity, self-awareness dedication, external conduct amongst the people

**Paper No. SEC.1.2 Banking Service Skills****Course Outcomes**

- 1 It is helpful to acquaint the knowledge of banking procedure
- 2 It is helpful to understand the detail knowledge of banking and financial situations
- 3 It is helpful to enable Banking, Economics, and management experience

**Skill Enhancement Course -I****Paper No. SEC.1.3 Basic Accounting skills****Course Outcomes:**

The students will be able to handle basic accounting practices skillfully.

**B. Com. Third Year  
Semester V (CBCS Pattern)**

**BC.5.1 Advanced Accounting – I****Course Outcomes**

Student can acquire knowledge of advance level of accounting for professional

**BC.5.2 Management Accounting – I****Course Outcomes:**

Students can take managerial decisions regarding finance of the business.

**BC.5.3 Auditing-I****Course Outcomes**

Regarding minute study to find out the fraud and errors in accounting

**BC.5.4A- Income Tax Law & Practices****Course Outcomes:**

To get oneself acquaint with the direct taxes and individual income.

**BC.5.4B- Human Resource Management****Course Outcomes:**

Regarding the major living aspect of business i.e. human resources, helps to know the recruitment and other basic needs.

**B.Sc. (Bachelor of Science)**

**Program Outcomes: B. Sc (Bachelor of Science)**

Our college is affiliated to Swami Ramanand Teerth Marathwada University, Nanded. We offer Chemistry, Botany and Zoology under this discipline. The college has applied to state government to rejuvenate the subjects like physics, mathematics and microbiology. The university has not designed the program outcomes in its curriculum. However, the college has designed, based on the subjects offered, the following program outcomes of the B SC program.



1. The program will develop the scientific temperate among the students.
2. It will develop interest for science among the students.
3. The students will be able to understand the basic concepts of the subject offered.
4. The students will be sensitive to the environmental issues.
5. New avenues of research and employment will be open to the students.
6. Students can do Post Graduate Studies in their respective subjects studied in 'Under Graduate' level.
7. The B.Sc. graduate students can pursue B.Ed. course and opt teaching career in the schools.

### **Major Chemistry NEP 2020 (With effect from 2024-25)**

#### **B. Sc. First Year (Semester-I)**

##### **Program Outcomes:**

The students graduating with degree having chemistry as a major or Minor should be able to acquire/have:

1. Core competency in subject chemistry and in allied subject areas.
2. Students are expected to have coherent understanding of fundamental principles, current trends as well as future opportunities in subject area.
3. Knowledge of basic principles in instrumental techniques used laboratory.
4. Capability to characterize, identify and separate components of unknown compounds using modern instrumental methods.
5. Competency in critical thinking after identifying assumption that frames our thinking and action, checking out their degree of accuracy, validity and finally our response from different Perspective.
6. Skill to apply role of chemistry in safe handling of chemicals, environmental issues and other societal concerns.
7. Awareness of different value systems including our own, understand moral dimensions of our decision and accept responsibility for them.
8. The ability to engage in lifelong learning in broadest context of socio-technological change
9. Ability to elicit views of others, mediate disagreements and come up with healthy conclusion in group discussion.

#### **UG Chemistry (Semester-I)**

##### **Paper- (SCHECT 1101):**

#### **Organic Chemistry & Inorganic Chemistry**

##### **Course Outcomes:**

1. The basic things for chemical reactions i.e. Substrate and Reagents Types of reagents Electrophilic and Nucleophilic Homolytic and heterolytic fission. Electronic displacement effect.
2. Aromatic, antiaromatic and nonaromatic for organic compounds.
3. The different intermediates in chemical reactions and their uses in synthesis



4. Appreciate the concept of grouping elements in accordance to their properties led to the development of Periodic Table.
5. compare the reactivity of elements and correlate it with their occurrence in nature;
6. Understand the ideas related to periodic properties of elements such as atomic radii, ionization enthalpy, electron gain enthalpy, electronegativity.

### **Organic Chemistry & Inorganic Chemistry (Practical)**

#### **Course Outcomes:**

After successfully performing practicals, students will be able to:

1. Identify type of titration and estimation of ions.
2. Prepare required standard solution.
3. Determine hardness of any water sample.
4. Handle protocol for the synthesis of organic compound.
5. Select suitable purification method for synthesized organic compound.
6. Determine physical constant of solid/liquid.

### **Generic Elective (GE) Paper First (SCHEGE 1101)**

#### **Course Outcomes:**

After studying this students will be able

- to understand the chemistry behind the product which we use in our day to day life.
- enlightened about the pros and cons of using processed food.
- to create curiosity among the readers about chemicals.

### **UG Year I: Semester I (SCHES1101)**

#### **Skill Enhancement Course**

#### **Fundamentals of Chemistry Laboratory**

##### **Course Outcomes:**

1. Safety and Laboratory Management: Students will understand and implement essential safety protocols and procedures for working in a chemistry laboratory, including proper lab design, storage, ventilation, and safety provisions, ensuring a safe and efficient working environment.
2. Familiarity with Laboratory Apparatus: Students will identify, handle, and maintain various laboratory apparatus, including glassware, volumetric tools, and miscellaneous equipment, gaining proficiency in their proper use and storage.
3. Solution Preparation Skills: Students will accurately prepare chemical solutions, understanding the concepts of solubility, concentration measurements (percentage, molarity, normality, molality), and the calculation of masses and volumes for preparing solutions, essential for conducting precise and reliable experiments.

**OR**

### **UG I st Year Semester I (SCHES1101)**

#### **Skill Enhancement Course**

#### **Water Pollution**

##### **SKILLS/ COMPETENCIES / LEARNING OUTCOMES**

Upon completion of this course, students should be able to:

1. List the main water pollutants and their effects on human health and the environment.



2. Discuss several types of water pollution problems and their chemical aspects affecting them.
3. Interpret the results of laboratory analysis for water characterization.
4. Develop a broad overview understanding of the strategies, regulations and policies to manage water pollution.
5. Describe unit operations used for wastewater treatment.
6. Select methods to control and prevent water pollution to meet effluent requirements within realistic constraints, such as economic, environmental and social aspects, health and safety.
7. Design and optimize various unit operations and unit processes used in water treatment and configure processes in a treatment plant. This includes obtaining and applying appropriate design values and making appropriate assumptions when needed

**(Semester-II)**

**Paper- Physical Chemistry & Inorganic Chemistry (SCHECT1151)  
(Theory)**

**Course Outcomes:**

After studying mentioned topics students will able to know:

1. Intermolecular forces of interactions.
2. Distinguish between true solution, colloidal solution and suspension solution.
3. Applications of adsorption and colloids.
4. Define the acidic and basic radicals.
5. Uses of noble gases in diversified fields.
6. Explain the role of common ion effect, solubility product and complex formation during the separation metal ions.
7. Define the terms oxidation, reduction, oxidising agent and reducing agent.
8. Use the concept of oxidation number to identify oxidant and reductant in a reaction.
9. Balance chemical equations using (i) ion electron method (ii) oxidation number method.

**Paper- Physical Chemistry & Inorganic Chemistry (SCHECP1151)  
(Practical)**

**Course Outcomes:**

After Performing experiments students will able to know:

1. Properties of water i.e. surface tension, viscosity, density etc.
2. To prepare solutions of desired concentrations.
3. Nature of aqueous solution of substance i.e. acidic, basic or natural.
4. The quantity of solute in solution using different titrimetric techniques.
5. The ideas to identify acidic or basic radicals qualitatively.

**Generic Elective (GE) Paper Second (SCHEGE 1151)**

**Soil and Fertilizer Chemistry**

**Course Outcome:**

After completion of syllabus students will be able to understand following outcomes.

- To define the concept of soil and fertilizer.
- To aware about the soil and effect of excessive fertilizers.
- To understand the importance of agriculture on global economy.



- To explain the seriousness of agro problems.

## Semester II

### Skill Enhancement Course

#### Common Laboratory Techniques

##### Course Outcomes:

1. Proficiency in Essential Laboratory Techniques: Students will demonstrate proficiency in refluxing, filtration, recrystallization, distillation, and boiling point determination, including the use of appropriate apparatus and adherence to safety precautions.
2. Enhanced Laboratory Safety Practices: Students will identify and mitigate fire, chemical, and gas hazards in the laboratory by applying safety protocols, proper handling and storage of hazardous materials, and appropriate emergency response measures.
3. Effective Use of Computer Technology in Laboratories: Students will effectively use computer hardware and software for laboratory applications, including data input, processing, and output, and utilize MS Office and Internet resources to support laboratory activities and data management.
4. Hands-On Laboratory Experience: Students will gain practical experience in preparing hydrogen sulfide gas, performing acid-base titrations, preparing distilled/deionized water, purifying organic compounds, preparing inorganic double salts, and conducting chromatography experiments, enhancing their laboratory skills and techniques.

OR

#### Skill Enhancement Course (SCHES 1151)

##### Soil Pollution

##### Course Outcomes

1. Apply knowledge of soil structure and soil formation to address soil environment issues.
2. Apply physical and chemical parameters of soil environment in the process of soil degradation and pollution assessment.
3. Evaluate the soil degradation, advantages and disadvantages of preventing and improving methods for soil pollution.
4. Assess the causes and sources of pollution to treat soil contamination.
5. Read English documents for describing soil degradation and pollution phenomena.
6. Practise the role and responsibility of an environmental engineer in soil environment toward the society.
7. Conceive ideas of soil environment improvement in soil degradation and pollution.

#### B. Sc. Second Year CBCS Pattern

**Course No. :-**CCC III (Section A)

**Name of the Course:-** Theory Paper-VI Organic + Inorganic Chemistry (P-VI)

##### Course Outcomes:

- Learn the mechanism of name reactions.
- Know the Synthesis, and Reactions of Aromatic Carboxylic and Sulphonic acids.
- Know the Synthesis, and Reactions of Organometallic compounds.
- Learn the synthesis, mechanism, applications of active methylene compounds.
- Gathering basic knowledge of Oils, Fats, Soaps and Detergents.
- Understand the basic principle and application of Qualitative Analysis.



Know the Classification, Properties of Non- aqueous solvents.

**Course No. :-CCC III (Section A)**

**Name of the Course** :- Theory Paper-VII Physical + Inorganic Chemistry (P-VII)

**Course Outcomes:**

After completion of these courses students should be able to,

Write an expression of Davisson-Germer experiment.

Derive Schrodinger wave equation.

Understand De-Broglie's hypothesis and uncertainty principle.

Solve the numerical problems based on De-Broglie.

Understand concept of entropy.

Understand statements of first, second and third law of thermodynamics.

Know the meaning of phase, component and degree of freedom.

Know the nuclear structure & different energy of nuclear.

Understand the different steps & procedure in the gravimetric separation method.

**Course No. :-CCC III (Section A)**

**Name of the Course** :- Theory Paper-VIII Organic + Inorganic Chemistry (P-VIII)

**Course Outcomes:**

Learn the stereoisomerism of Chiral compounds.

Know the Classification, and Reactions of carbohydrates.

Know the Synthesis, and Reactions of Nitrogen Compounds.

Gathering applications of Reagents in Organic Synthesis.

Understand the Characteristics of d-Block Elements.

Know the Characteristics of d-Block Elements.

**Course No. :-CCC III (Section A)**

**Name of the Course** :- Theory Paper-IX Physical + Inorganic Chemistry (P-IX)

**Course Outcomes:**

After completion of these courses students should be able to,

Know the rate constant and factors affecting rate of reactions.

Write an expression for rate constant (K) for first order, second order reaction.

Know the terms cell constant, specific conductivity, equivalent conductivity and molar conductivity.

Know the applications of Kohlrausch's law.

Compare between thermal and photochemical reactions.

Discuss different types of photochemical process.

Know the preparation, properties, structure & application of different compounds.

Discuss different inter halogen compounds by preparation, properties, structure and uses.

**B. Sc. Third Year: Semester-V**

**Course No. :-(DSEC-V, Section A)**

**Name of the Course** :- Theory Paper-XII Organic + Inorganic Chemistry (P-XII)

**Course Outcome(s)**

1. Learn the mechanism of electrophilic Substitution reaction of Heterocyclic Compounds.
2. Know the characteristics, Classification and synthesis of Drugs and Dyes.



3. Explaining theories of Colour and chemical constitution of Dyes.
4. Gathering basic knowledge of Alkaloids, Vitamins and Pesticides
5. Understand the basic principle and application of coordination complexes
6. Know the application of elements in Medicine

**Course No. :-(DSEC-V, Section B)**

**Name of the Course** :- Theory Paper-XIII Physical + Inorganic Chemistry (P-XIII)

**Course Outcome(s)**

1. Understand the concepts of molecular Spectroscopy and its applications
2. Analyze Rotational, Vibrational and Raman, Spectra
3. Interpret the theoretical and experimental methods of chemical kinetics
4. Know the theory and application of Distribution law
5. Explain the Nomenclature, classification and application of Organometallic Compounds
6. Illustrate the classification and application of Metal Carbonyls

**Course No. :-(SEC III, DSECP-III) DSEC Vth & VIth (Section-A)**

**Name of the Course :- Skill Enhancement Course- Computer Application in Chemistry  
or**

**Applied analytical chemistry**

**B. Sc. Third Year: Semester-VI**

**Course No. :-(DSEC-VI, Section A) (A1)**

**Name of the Course** :- Theory Paper-XIV Organic + Inorganic Chemistry (P-XIV)

**Course Outcome(s)**

1. To learn the basic principle and terms used in UV, IR & NMR Spectroscopy
2. Acquire the fundamental knowledge of classification and Synthesis of Amino Acid and Peptides
3. Describe the types of Rearrangement
4. Postulates and limitations of VBT and CFT
5. Calculation of CFSE for Tetrahedral and Octahedral Complexes
6. Explain the types of electronic transition and selection rule
7. Apply spectroscopic techniques in analyzing the structure of simple organic Molecules

**B. Sc. Third Year: Semester-VI**

**Course No. :-(DSEC-VI, Section B)**

**Name of the Course** :- Theory Paper-XV Physical + Inorganic Chemistry (P-XV)

**Course Outcome(s)**

1. Basic concepts of electrochemistry and its applications
2. Understanding the Nernst heat theorem and the Thermodynamics open system
3. Know the Vant-Hoff's Reaction Osochore and numerical on it
4. Explain the types of magnetic substances and effect of temperature on it
5. Biological role of alkali and alkaline earth metal ions
6. Describe the structures and functions of Metal Cluster

**Course No. :-(SEC IV, DSECP-IV) DSEC Vth & VIth (Section-B)**



**Name of the Course :- Skill Enhancement Course- Spectroscopic Techniques and Cosmetic Preparation**

**OR**

**Basic analytical chemistry**

**Course Outcome(s)**

1. Be able to determine the structure by using Spectra
2. To train the students for the preparation of various cosmetics



## **B.Sc. Botany**

### **Learning Objectives :**

The Objective of this program are :

1. To provide an updated education to the students at large in order to know the importance and scope of the discipline and to provide mobility to students from one university or state to other.
2. To update curriculum by introducing recent advances in the subject and enable the students to face NET, SET, UPSC and other competitive examinations successfully.
3. To impart knowledge of plant science as the basic objective of Education.
4. To develop a scientific attitude to make students open minded, critical and curious.
5. To develop an ability to work on their own and to make them fit for the society.
6. To expose themselves to the diversity amongst life forms.
7. To develop skill in practical work, experiments, equipments and laboratory use along with collection and interpretation of plant materials and data.
8. To make aware of natural resources and environment and the importance of conserving the same.
9. To develop ability for the application of the acquired knowledge in the fields of life so as to make our country self reliant and self sufficient.

### **B.Sc. S.Y. Botany**

#### **Major in BOTANY and Minor in DSM (Subject)**

#### **Under the Faculty of Science & Technology**

**(Revised as per the Govt. of Maharashtra circular Dt. 13th March 2024)**

### **Program Outcomes:**

#### **The Outcomes of this program are:**

**PO1:** This program will train and orient the students in the field of diversity of different life forms, Plant Anatomy, Plant Embryology, Plant Physiology, Plant Metabolism and Biochemistry.

**PO2:** This program will help the students for their career development.

**PO3:** This program will provide updated curriculum with recent advances in the subject and enable the students to face NET, SET, UPSC and other competitive examination successfully.

**PO4:** This program shall train and orient the students for laboratory skills and serve as human resource for the educational institutes, industries and other organizations.

**PO5:** The program also has a strong interdisciplinary component. Emphasis is given on the experimental learning through hands-on laboratory exercises, field trips and assignments.

**PO6:** Students will be able to understand and explain different specializations of Botany such as anatomy, Embryology, developmental biology, physiology, biochemistry etc. Students will be able to demonstrate the experimental techniques and methods in plant sciences and have innovative research ideas.





**PO7:** The program will enlighten the current thrust areas of the subject and provide substantial exposure and skills in plant biology.

**PO8:** Skill Enhancement Courses being offered during this program will provide job opportunities and additional specific skills to the students for self-employability through the development of their own enterprises.

**Major in BOTANY and Minor in DSM (Subject)**

**Under the Faculty of Science & Technology**

**(Revised as per the Govt. of Maharashtra circular Dt. 13th March 2024)**

**PROGRAM SPECIFIC OUTCOMES (PSO) OF B.Sc. BOTANY:**

By the end of the program the students will be able to:

**PO1:** Skill development for the proper description using botanical terms, identification, naming and classification of life forms especially plants and microbes.

**PO2:** Acquisition of knowledge on structure, life cycle and life processes that exist among plant and microbial diversity through certain model organism studies.

**PO3:** Understanding of various interactions that exist among plants and microbes; to develop the curiosity on the dynamicity of nature.

**PO4:** Understanding of the major elements of variation that exist in the living world through comparative morphological and anatomical study.

**PO5:** Ability to explain the diversity and evolution based on the empirical evidences in morphology, anatomy, embryology, physiology, biochemistry, molecular biology and life history.

**PO6:** Skill development for the collection, preservation and recording of information after observation and analysis- from simple illustration to molecular database development.

**PO7:** Making aware of the scientific and technological advancements- Information and Communication, Biotechnology and Molecular Biology for further learning and research in all branches of Botany..

**PO8:** Internalization of the concept of conservation and evolution through the channel of spirit of inquiry.

**PO9:** To enable the graduates to prepare for national as well as international level competitive examinations like UGC-CSIR, UPSC etc.

**PO10:** To enable the students for practicing the best teaching pedagogy as a biology teacher including the latest digital modules.

**PO11:** The graduates should be knowledgeable and competent enough to appropriately deliver on aspects of global importance like climate change, SDGs, green technologies etc at the right opportunity. **PO12:** The graduate should be able to demonstrate sufficient proficiency in the hands-on experimental techniques for their area of specialization within biology during research and in the professional career. **PO13:** The program enables the students to face NET, SET, MPSC, UPSC and other competitive examinations successfully.

**B. Sc. Botany, First Year Semester – I As Per National Education Policy- 2020**

To be Implemented from Academic Year 2024-2025

**(Semester - I)****Major Core Theory Course****Course Code – SBOTCT 1101 Title of the Course: VIRUSES, BACTERIA AND ALGAE****Course outcomes:**

1. The students understand the morphology, structure, and evolution of various organisms like Viruses, Bacteria and Algae.
2. The students are able to differentiate between various groups of Viruses, Bacteria and Algae.
3. The students learn the importance of Viruses, Bacteria and Algae for human beings

**Major Practical Course****Course Code – SBOTCP 1101 Title of the Course: Practical based on SBOTCT 1101****Course outcomes:**

1. Students develop skill and technique for handling microscope and different instruments in the Botany lab.
2. The students understand the morphology, structure, and interdependence of various organisms like Viruses, Bacteria and Algae.
3. The students learn the importance of Viruses, Bacteria and Algae for human beings.

**Generic Elective Course****Course Code – SBOTGE 1101 Title of the Course: MEDICINAL PLANTS AND THEIR USES-I****Course outcomes:**

1. Understand history, Scope and Importance of Medicinal Plants & indigenous Medicinal Sciences
2. Describe the common medicinal plants in the neighborhood for therapeutical use.
3. Conserve endangered and endemic medicinal plants. 4. Efficient in modern tool use to get additional knowledge from the internet.

**Skill Enhancement Course****Course Code – SBOTSC1101 Title of the Course: TRICHODERMA CULTIVATION TECHNIQUE****Course outcomes:**

1. Understanding the role of organic farming.
2. Understanding the potential of Trichoderma as an alternative to chemical fertilizers
3. Role of Trichoderma in protecting the environment and managing the waste.

**Semester – II****Course Code – SBOTCT 1151 Title of the Course: FUNGI, LICHENS AND MYCORRHIZA****Course outcomes:**



1. The students understand the morphology, structure, and interdependence of various organisms like Fungi, Lichens and Mycorrhiza.
2. The students are able to differentiate between various groups of Fungi, Lichens and Mycoplasma.
3. The students learn the importance of Fungi, Lichens and Mycoplasma for human beings

#### **Major Practical Course**

**Course Code – SBOTCP 1151 Title of the Course: Practical based on SBOTCT 1151**

#### **Course outcomes:**

1. Students develop skill and technique for handling microscope and different instruments in the Botany lab.
2. The students understand the morphology, structure, and interdependence of various organisms like Viruses, Bacteria, Algae, Fungi, Lichens and Mycoplasma.
3. The students learn the importance of Fungi, Lichens and Mycoplasma for human beings.

#### **Generic Elective Course**

**Course Code – SBOTGE 1151 Title of the Course: MEDICINAL PLANTS AND THEIR USES-II**

#### **Course outcomes:**

1. Understand history, Scope and Importance of Medicinal Plants & indigenous Medicinal Sciences
2. Describe the common medicinal plants in the neighborhood for therapeutical use.
3. Conserve endangered and endemic medicinal plants. 4. Efficient in modern tool use to get additional knowledge from the internet.

#### **Skill Enhancement Course**

**Course Code – SBOTSC 1151 Title of the Course: MUSHROOM CULTIVATION TECHNIQUE**

#### **Course outcomes:**

1. Students understand mushroom cultivation technique
2. Students understand the potential of mushroom cultivation as a source of food.
3. Students understand the potential of mushroom cultivation as a source of self-employment.

#### **B.Sc. S.Y. Semester –III**

#### **CCB-III (A)**

#### **Theory Paper –VI : Plant Anatomy(Compulsory )**

#### **Course Outcomes:**

1. The students will be able to understand the meristem (RAM & SAM) different simple and complex tissues and secondary growth in root and stem.
2. Students will acquire knowledge of anatomy of root, stem and leaf in dicot and monocot plants.



### **Semester –IIICCB-III (B)**

#### **Theory Paper –VII : Plant Physiology & Biochemistry(Compulsory )**

##### **Course outcomes:**

1. Students understand mushroom cultivation technique
2. Students understand the potential of mushroom cultivation as a source of food.
3. Students understand the potential of mushroom cultivation as a source of self-employment.

### **B.Sc. S.Y. Semester –IV**

#### **CCB-IV (A)Theory Paper –VIII : Plant Embryology(Compulsory )**

##### **Course Outcomes:**

1. This course will be able to demonstrate foundational knowledge in embryology of plants.
2. Students will be able to understand the development of pollen, Ovule, and fertilization and palynological information.

### **B.Sc. S.Y. Semester –IV**

#### **CCB-IV (B)Theory Paper –VIII : Plant Metabolism & Biotechnology(Compulsory )**

##### **Learning Outcomes:**

1. Students will be able to understand the various metabolic processes such as photosynthesis, respiration, Nitrogen metabolism etc. which are important for life.
2. Students shall be become familiar with the gene cloning and its transfer in plants
3. Students shall learn different databases and their applications

##### **PROGRAM OUTCOMES (POs):**

**PO1:** This program will train and orient the students in the field of Cell Biology, Molecular Biology, Plant Breeding, Plant Pathology, Systematic Botany, Herbal Technology and Other fields of Botany.

**PO2:** This will provide updated curriculum with recent advances in the subject and enable the students to face NET, SET, UPSC and other competitive examinations successfully.

**PO3:** Students shall be able to identify different plant species, plant diseases and shall be able to do their management.

**PO4:** This program shall train and orient the students so as to develop human resource for the educational institutes, industries and other organizations.

**PO5:** This will also develop specific skills amongst students for self employability through the development of their own enterprises.

**PO6:** This shall develop ability in the students for the application of the acquired knowledge in the fields of life so as to make our country self-reliant and self-sufficient.



**B.Sc. T.Y. Botany  
Semester – VDSEB-I**

**Theory Paper –XII :Cell & Molecular Biology (Compulsory )**

**Learning Outcomes:**

1. The students will be able to understand ultra structure of a cell, cell wall, cell membrane, cell organelles and chromosomes, cell cycle and cell division.
2. The students will be able to understand in detail the structure of DNA and RNA, protein synthesis, gene structure, gene mutation and related diseases.
3. Students will acquire knowledge of cell and molecular biology

**B.Sc. T.Y. Botany Semester – VDSEB-I**

**Theory Paper –XIII :Plant Pathology(Compulsory )**

**Learning Outcomes:**

1. The students will be able to understand fundamentals of plant pathology.
2. The students will be able to understand in detail the process of plant disease development.
3. Students will acquire knowledge of different plant diseases in different plants.

**B.Sc. T.Y. Botany Semester – VIDSEB-I**

**Theory Paper –XIII :Genetics & Plant Breeding(Compulsory )**

**Learning Outcomes:** Students shall

1. Understand Mendelian genetics, gene interaction.
2. Learn the sex determination, linkage, sex linked inheritance and genetic variations.
3. Understand various crop improvement methods in plant breeding.

**B.Sc. T.Y. Botany Semester – VIDSEB-I**

**Theory Paper –XV :Plant Pathology-II(Compulsory )**

**Learning Outcomes:**

1. The students will be able to understand fundamentals of aerobiology and seed pathology.
2. The students will be able to understand in detail the process of plant Defense mechanism and management.
3. Students will acquire knowledge of different plant diseases in different plants.

**DSEZ-I; Section-A:**

**PAPER-XII- ECOLOGY AND ZOOGEOGRAPHY:**

- \_ To understand and appreciate the interactions of organisms with their environments and the consequences of these interactions for population, community, and ecosystem dynamics.
- \_ To be aware of the current environmental issues with an understanding of the basic ecological concepts involved.
- \_ To study the local and geographical distribution and abundance of organisms (habitat niche, community, bio-geography).
- \_ To understand the inter-relationship between individuals in population and communities



(population ecology).

- \_ To study the structural adaptations and functional adjustment of organisms to their physical environment.
- \_ To study the conservation and management of natural resources and pollution (applied ecology).

#### **DSEZ-I; Section-B: PAPER-XIII (C)- ENTOMOLOGY- I**

- \_ To define general entomology and classifying insects according to their economic importance.
- \_ To acquaint students with the morphology and anatomy of selected insect species.
- \_ To introduce students to insect biology.
- \_ To impart knowledge of insect ecology covering factors like effect of light, temperature, humidity.

#### **DSEZ-II; Section-A: PAPER-XIV- ETHOLOGY, BIOMETRY AND BIOINFORMATICS**

- \_ To study the behavior of organism under natural conditions (Ethology).
- \_ To understand the concepts of Biometry.
- \_ To get acquainted with and apply the fundamentals of applied statistical methodology.
- \_ To give students an introduction to the basic practical techniques of bioinformatics.
- \_ To emphasize the application of bioinformatics and biological databases for problem solving in real-life & research.
- \_ To familiarize student with the use of a wide variety of internet applications, biological database and to enable them to apply these methods under various situations.

#### **DSEZ-II; Section-B: PAPER-XV(C)- ENTOMOLOGY- II:**

- \_ To introduce students to the ecology and biology of insects of medical and agricultural importance.
- \_ To provide students with opportunities to understand insect pest management techniques such as cultural, physical, Biological, chemical, IPM etc.
- \_ To provide students an adequate knowledge of various types of insecticides and problems associated with their use.
- \_ To equip students knowledge of practical applications of insecticides and maintenance of pesticide equipment.



**ZOOLOGY**  
**Major in DSC and Minor in DSM (Subject)**  
**With effect from June 2024**  
**Academic Year 2024 – 2025 (As per NEP-2020)**

**Program Outcomes:**

- To provide students with a strong foundation in the basic science, scientific and fundamentals necessary to formulate, solve and analyze problems and to prepare them for undergraduate studies.
- To prepare students to demonstrate an ability to identify, formulate and solve basic science problems.
- To prepare students to demonstrate ability to design systems and conduct experiments, analyze and interpret data.
- To prepare students to demonstrate for successful career in industry to meet needs Four Year UG Credit Framework of Sci. & Tech. Faculty of S.R.T.M.U. Nanded Page 5 of 48 of Indian and multi-national companies. To develop the ability among students to synthesize data and technical concepts.
- To provide opportunity for students to work as part of teams on multidisciplinary projects.
- To promote awareness among students for the life-long learning and to introduce them to professional ethics and codes of professional practice.

**Course Outcomes of the Program**

**B. Sc. First Year**  
**Zoology (W.e.f. June -2024)**  
**Semester-I**

**SZOOCT1101 : Biodiversity of Non-chordates**

**Course outcomes:**

1. The student will be able to identify a given non-chordates up to class level.
2. Ability to understand the contribution of non-chordates in the biodiversity index of any given habitat.
3. Ability to understand and appreciate the ecological and economic importance of non-chordates.
4. Ability to identify and describe external morphology and internal anatomical features of representative non-chordates species.

**SZOOCP1101 : Biodiversity of Non-Chordates (Based on Paper No. SZOOCT1101)**

**Course Outcomes:**

1. Ability to understand the anatomical organization of organs and systems in representative species.
2. Ability to identify and describe structure and functions of different body parts of non-chordates.



3. Students would be able to prepare temporary and permanent mountings of biological material.
4. Students would make observations of organisms in their natural environment and document them.

### **Generic Elective (GE/OE)**

#### **SZOOG1101: Animal Diversity - I**

**Course Outcomes :** Upon completion of the course, students will be able to:

1. Distinguish between major phyla of animals through a demonstrated understanding of their taxonomic classification and diversity.
2. Describe the distinguishing characteristics of all major phyla.
3. Understand the fundamental differences among animal body plans and relate them to function, taxonomic classification, and evolutionary relationships among phyla.
4. Illustrate lifecycles, structure, function and reasons for importance of few representative organisms from different groups of animals.
5. Identify anatomical structures from prepared tissues.
6. Observe living animals in the environment and relate observations to theory from the course.
7. Recognize major animal phyla and animals on the basis of their external characteristics.

#### **Skill Enhancement Course in Zoology**

##### **SZOOSC1101: (A) Parasites of Public Health Importance**

**Course Outcomes:**

1. Due to this, the study of these parasites is of paramount significance, to which this skill set attempts to address.
2. Knowledge and understanding of biology of parasites of public health importance.
3. Recognize and appreciate the medical importance of common arthropods and diseases caused by them.
4. Flawlessly perform collection, processing, identification and reporting of parasites of public health importance.

#### **Skill Enhancement Course in Zoology**

##### **SZOOSC1101: (B) Vermiculture & Vermicomposting**

Course Outcomes:

1. Knowledge of morphology and biology of earthworms used in vermiculture.
2. Ability and skill of rearing earthworms and using them in vermicomposting.
3. Proper operating of implements and equipment used in vermicomposting.

### **Semester-II**

#### **SZOOCT1151 : Biodiversity of Chordates**

**Course outcomes:**

1. The student will be able to identify and understand the Biodiversity of Chordates.
2. Ability to understand anatomical relation between different vertebrate classes.
3. The learner will be able to understand the economic importance of Chordates.





### **SZOOC1151 : Biodiversity of Chordates (Based on Paper No. SZOOC1151)**

#### **Course Outcomes:**

1. Ability to understand the anatomical organization of organs and systems in representative species.
2. Ability to identify and describe structure and functions of different body parts of vertebrates.
3. Students would be able to prepare temporary and permanent mountings of biological material.
4. Students would be able to relate different bones and be able to articulate them to form an skeleton.
- 5 Students would make observations of organisms in their natural environment and document them.

#### **Generic Elective (GE/OE)**

### **SZOOG1151: Animal Diversity - II**

#### **Course Outcomes**

Upon completion of the course, students will be able to:

1. Distinguish between major phyla of animals through a demonstrated understanding of their taxonomic classification and diversity.
2. Describe the distinguishing characteristics of all major phyla.
3. Understand the fundamental differences among animal body plans and relate them to function, taxonomic classification, and evolutionary relationships among phyla.
4. Illustrate lifecycles, structure, function and reasons for importance of few representative organisms from different groups of animals.
5. Identify anatomical structures from prepared tissues.
6. Observe living animals in the environment and relate observations to theory from the course.
7. Recognize major animal phyla and animals on the basis of their external characteristics

#### **Skill Enhancement Course in Zoology**

### **SZOOSC1151: (C) Aquarium Keeping**

#### **Course Outcomes:**

1. Describe different types of aquariums and raw material used to fabricate them.
2. Ability to properly handle material and accessories for aquarium fabrication and installation.
3. Identify water parameters and adjust them to normal conditions.

#### **Skill Enhancement Course in Zoology**

### **SZOOSC1151: (D) Animal Museology**

#### **Course Outcomes:**

1. After completion of the course the students self-sufficient in the preservation techniques of biological specimens, which would be an asset for safeguarding artifacts derived from animal and plants act as to provide great opportunity for self-employment.
2. Learners are expected to be able to handle museum objects, identify the factors and causes of deterioration and be able to take proper preservative measures. 3. Job opportunity as a curator.

**B.Sc. Second Year (Semester III & Semester IV) Syllabus w.e.f. June, 2020****Choice Based Credit System (CBCS) Course Structure****Semester Pattern Syllabus****Semester- III****Paper: CCZ- III: Physiology and Biochemistry****Section- A Title of Paper: Paper- VI: Physiology****Outcome of the Course:**

On successful completion of the course, the students will be able to

1. Monitor their blood pressure and identify blood groups.
2. Understand function and types of heart & circulatory system.
3. Appreciate the basic function of kidney, main function of nerves.
4. Acquire knowledge on the nature and functions of hormones and learn the mechanism of hormone action.
5. Learn the structure and functions of Endocrine glands.
6. Understand the structure, development and function of reproductive organs in human.

**Paper: CCZP- II Section- A & B****Title of Paper: Practical Paper X: Physiology and Biochemistry  
(Practical based on P-VI & VII)****Course Outcomes:**

1. Students able to improve the skills in microscopy, slide preparation, observations, drawings and laboratory techniques.
2. To acquaint the students with operations of the different laboratory equipment.
3. Ability to understand the detection of blood groups of humans.
4. Ability to Understand the estimation of blood cell counts, Haemoglobin content in humans.
5. To acquaint the students with operation of clinical procedures for blood & urine analysis.

**Semester- IV****Paper: CCZ-IV: Cell Biology, Genetics, Evolutionary Biology and Genetic Engineering****Section- A Title of Paper: Paper- VIII: Cell Biology and Genetics****Outcome of the Course:**

On successful completion of the course, the students will be able to

1. Understand the structure and function of the cell as the fundamentals for understanding the functioning of all living organisms.
2. Understand structures and various cellular functions associated with the macromolecules found in cells.
3. Acquire knowledge of Mendelian Genetics and its Extension.
4. Graduates will be able to explain and interpret various processes, phenomena, states and evolutionary tendencies at a biological system level.

**Paper: CCZ- IV: Cell Biology, Genetics, Evolutionary Biology and Genetic Engineering****Section- B Title of Paper: Paper- IX: Evolutionary Biology and Genetic Engineering****Outcome of the Course:**

On successful completion of the course, the students will be able to

1. Understand the theories and concepts of evolution.
2. Learn the process of evolution in animals.
3. Understand the patterns of evolutionary changes in animals.
4. Understand the organization and functions of genetic material in the living world.
5. Understand the Recombinant DNA Technology.

**Paper: CCZP- III Section –A & B****Title of Paper: Practical Paper XI: Cell Biology, Genetics, Evolutionary Biology and Genetic Engineering (Practical based on P-VIII & IX)****Course Outcomes:**

1. Students would be able to prepare temporary squash preparations of onion root tips for mitosis.
2. Demonstrate the genetic traits in Man.
3. Ability to culture Drosophila flies in the laboratory.
4. Ability for mounting of salivary glands of Drosophila larvae.
5. Students are able to understand the outline of Genetic Engineering.
6. Ability to Learn the role of Genetic Engineering in biology.

**Skill Enhancement Course (SEC)****SECZ –I (A): HAEMATOLOGY****Course Outcomes**

1. Ability to explain composition and functions of blood.
2. Knowledge about compounds used in processing and storage of blood.
3. Skill to be able to use different techniques used in study of blood cells.
4. Ability to collect, preserve and analyze blood samples.
5. Knowledge of changes in blood composition in disease.

**SECZ –I (B): URINOLOGY****Course Outcomes**

1. Ability to describe function of human urinary system.
2. Skill to collect, preserve, process and store urine samples.
3. Skill to perform physical, chemical and microscopic examination of urine samples.
4. Ability to document findings of urine examination/analysis.

**SECZ –II (C): HISTO-TECHNOLOGY****Course Outcomes**

1. Ability to identify different types of tissues and distinguish between different components of cells.



2. Skill related to fixation of tissue samples and microtechnic processing of tissues.
3. Ability to identify, handle and catalogue slides of different tissues.
4. Students' skill in operating and maintaining different types of microtomes.

### **SECZ- II (D): APICULTURE**

#### **Course Outcomes**

1. Ability to understand and describe the life stages and social organization of honey bee species.
2. Ability to correctly explain and perform bee rearing, farming and harvesting practices.
3. Appreciate the economic importance of derivative benefits and byproducts of apiculture.
4. To identify and take remedial measures against the different bee diseases and predators.

### **B.Sc. Third Year**

#### **Zoology**

#### **Choice Based Credit System (CBCS-R2021) Course Structure**

**Effective from June, 2021**

**B.Sc. Third Year Syllabus w.e.f. June, 2021**

#### **Semester -V**

**Paper: DSEZ-I; Section –A Title of Paper: Paper-XII -Ecology & Zoo-geography**

#### **Course Outcomes:**

1. Demonstrate knowledge of biotic and abiotic interactions.
2. Express understanding of environmental issues, and inter-relation between different components of an ecosystems.
3. Ability to elaborate about distribution and abundance of organisms.
4. Apply different experimental techniques to study any ecosystem or its components.
5. Describe the relation between structure and function species in environment.
6. Display knowledge of natural resources and pollution management techniques.

**Paper: DSEZ-I; Section –B Title of Paper: Paper-XIIIA -Pisciculture**

#### **Course Outcomes:**

1. Ability and skill to design and construct a fish farm.
2. Skill to describe and undertake different methods of fish breeding.
3. Describe different food fish species and their capture methods used in India.
4. Elaborate about different fishing craft and gear used in Indian capture fishery.
5. Knowledge of fish diseases and skill to treat sick fish with appropriate techniques.

**Paper: DSEZ-I; Section –B Title of Paper: Paper-XIIIB -Applied Parasitology-I (Parasitic Protozoa and Platyhelminthes)**

#### **Course Outcomes:**

1. Demonstrate understanding of basics Applied parasitology; host-parasite relationships and life cycle of parasites.



2. An understanding of epidemiology, disease transmission and control & treatment of parasitic diseases caused by protozoans and platyhelminthes.
3. An ability to identify and describe common protozoan and helminth parasites.
4. Knowledge of locally occurring human parasites and national parasitic diseases.
5. An understanding of economic cost of animal and human parasitic diseases.

**Paper: DSEZ-I; Section -B Title of Paper: Paper- XIII (C)-  
Entomology-I (General Entomology)**

**Course Outcomes:**

1. Knowledge of the structure and function of earth's ecosystem.
2. An understanding of different types of ecosystems and biodiversity
3. An ability to classify biodiversity and identify threats to biodiversity.
4. An understanding of human influence on biodiversity.
5. Knowledge of modern tools and technique for study and conservation of ecosystem and wildlife.

**Semester -VI**

**Paper: DSEZ-II; Section -A Title of Paper:  
Paper- XIV-Ethology, Biometry and Bioinformatics**

**Course Outcomes:**

1. An appreciation of animal behavior and complexities of ethology.
2. Knowledge of basic concepts and techniques of biometry.
3. Knowledge and skill to apply the techniques statistical methods in biology.
4. Knowledge and understanding of practical use of computers in bioinformatics.
5. An understanding of the use of biological databases in research.

**Paper: DSEZ-II; Section -B Title of Paper: Paper- XV(A)-Aquaculture**

**Course Outcomes:**

1. Knowledge and understanding of aquaculture methods, mariculture, and fish processing.
2. An understanding of the different man-made hazards to aquaculture.
3. Knowledge and skill to use different species of locally available larvivorous fish in vector control.
4. Knowledge and understanding of the role of Government agencies in development of aquaculture.

**Paper: DSEZ-II; Section -B**

**Title of Paper: Paper- XV (B) Applied Parasitology-II  
(Parasitic Nematodes and Arthropods)**

**Course Outcomes:**

1. An understanding of Parasitology of Nematodes and Arthropods.
2. Knowledge of morphology, biology, taxonomy & pathogenicity of nematodes in plants and animals.



3. Knowledge and skill to implement control measures against nematode parasites.
4. Understanding and knowledge of arthropods of public health importance.
5. Knowledge of vector-host-pathogen relationships in arthropod transmitted diseases.
6. An understanding of the different surveillance techniques and diagnosis methods used in control of and management of vector-borne diseases.

**Paper: DSEZ-II; Section -B Title of Paper:**

**Paper- XV (C)-Entomology-II (Applied Entomology)**

**Course Outcomes:**

1. An understanding and knowledge of ecology & biology of medically and agriculturally important insects.
2. Knowledge of the different beneficial and harmful insects.
3. An understanding of insect control methods- cultural, physical, biological, chemical & IPM.
4. Knowledge of types of insecticides and problems associated with their use.
5. Knowledge and skill of application of insecticides & maintaining pest control equipment.

**Paper: DSEZ-II; Section -B Title of Paper: Paper- XV (D)-Environmental Biology -II**

**Course Outcomes:**

1. Ability to assimilate causes of pollution, and its effects on environment.
2. Awareness about environmental issues and problems at local, national and international level.
3. An understanding of the laws and agencies pertaining to protection of environment.
4. Knowledge about environment, pollution and related problems.

### **Practical**

**Paper: DSEZP-I (Based on DSEZ-I; Section-A& DSEZ-II; Section-A)**

**Title of Paper: Paper- XVI**

**-Ecology, Zoo-geography, Ethology, Biometry and Bioinformatics**

**Course Outcomes:**

1. Skill of handling, testing and analysis of water samples.
2. Recognition and description of animal adaptations under different ecological and zoo-geographic conditions.
3. Describe animal responses to different environmental signals.
4. Apply different techniques to gather analyze analyze data using a computer.
5. Browse, search and download information from online biological databases.

**Paper: DSEZP-II (Based on DSEZ-I; Section-B& DSEZ-II; Section-B)**

**Title of Paper: Pisciculture and Aquaculture {XVII (A)}**

**Course Outcomes:**

1. Perform fish farm practices, farm management, fish breeding & rearing.
2. Adopt appropriate fish preservation and processing techniques for fish by-products.



3. Ability to identify and describe fish of capture and culture food fish.

**Paper: DSEZP-II (Based on DSEZ-I; Section-B& DSEZ-II; Section-B)**

**Title of Paper: Applied Parasitology {XVII (B)}**

**Course Outcomes:**

1. Demonstrate knowledge and skill of identifying, classifying and describing different protozoan, helminth, nematode and arthropod parasites.
2. Perform preservation and mounting of protozoan, helminth, nematode and arthropod parasites.
3. Carry out collection and processing of soil and plant parasitic nematodes.

**Paper: DSEZP-II (Based on DSEZ-I; Section-B& DSEZ-II; Section-B)**

**Title of Paper: Entomology {XVII (C)}**

**Course Outcomes:**

1. Demonstrate awareness of, and skill to identify, classify and describe anatomical parts, organ systems and morphology of insects.
2. Explain the different methods of collection, preservation and curating of insects specimens.
3. Ability to handle equipment and other tools used in chemical and biological control of insect pests.

**Paper: DSEZP-II (Based on DSEZ-I; Section-B& DSEZ-II; Section-B)**

**Title of the Paper: Environmental Biology {XVII (D)}**

**Course Outcomes:**

1. Ability to measure different environmental parameters of water, air and soil.
2. Skill of identification of plant and animal biodiversity of an ecosystem.
3. Perform quantification of pollutants in abiotic and biotic components of an ecosystem.

**Major Mathematics (DSC)**

**Under the Faculty of Science and Technology**

**Effective from Academic year 2024 – 2025 (As per NEP-2020)**

**B.Sc. (Mathematics)**

**Program Outcomes (POs):**

**PO1** Disciplinary Knowledge: B.A/ B.Sc in Mathematics is the zenith of in-depth knowledge of Algebra, Analysis, Geometry, Calculus and several other branches of mathematics. This also leads to study interdisciplinary areas such as computer science and other allied subjects.

**PO2** Communication Skills: Ability to communicate various mathematical concepts effectively using examples and their geometrical visualization. Skill and Knowledge attained during program will increase the ability to solve real world problems.

**PO3** Digital Proficiency: The completion of this program will enable the learner to use appropriate software's to solve mathematical problems

**PO4** Ability to work Independently: The Learner completing this program will grow the capacity to do work independently.



**PO5** Critical Thinking and Logical Reasoning: Student will acquire ability of critical thinking and logical reasoning.

**PO6** Mathematical Principles: students will understand mathematical principles and their applications.

**PO7** Confidence of Learning: The B.Sc. Program will develop learners mathematical knowledge and oral, written, and practical skills in a way which will encourage confidence, satisfaction and learning enjoyment.

**PO8** Ability to peruse advanced studies and research: Students will be motivated high for doing higher education and research in Academically strong institution

**PO9** Skill/Vocational Courses: Students will have to study skill/Vocational courses related to pure and applied Mathematics.

**PO10** Generic /Open Elective : As an interdisciplinary approach student will study GE/OE course in Mathematics

### **Mathematics Curriculum**

#### **B.A. / B.Sc. I**

#### **SEMESTER-I**

#### **DSC-1 Topics in Algebra**

##### **Course Outcomes:**

CO1: Students can Sort one-one, onto functions and can compute equivalence relation.

CO2: Students Can apply Law of Induction and Euclidean Algorithms

CO3: Student can compute REF, RREF and rank of any ordered matrix

CO4: Student can solve Linear System of Equation and apply Caley Hamilton Theorem

#### **DSC-2: Lab Course -I (Calculus Using SAGE)**

##### **Course Outcomes:**

After successful completion of the course student will be able to

CO1: Do basic programming in Sage

CO2: Do practical's on Calculus

CO3: Know Programming and Data Structures

CO4: Plot 2D, 3D Curve and display solution of differential equation.

#### **GE/OE: Foundation of Mathematics**

##### **Course Outcomes:**

After Successful completion of this course students can able to

CO1: Compute distance formula, midpoint formula, equation of lines ,parallel lines and perpendicular lines

CO2: Find symmetry of graphs

CO3: Discuss limit and continuity of given function'

CO4: Apply derivatives to compute maxima and minima





### **Skill Enhancement Course**

#### **SEC- Basics of MATLAB/Scilab**

##### **Course Outcomes:**

After successful completion of the course student will be able to

CO1: Perform basic MATLAB/Scilab commands and will apply MATLAB/Scilab for elementary number theory problem.

CO2: Do Arithmetic Operations of Arrays

CO3: Solve elementary linear Algebra examples using MATLAB/Scilab

CO4: Compute Row Reduced Echelon Form

#### **(SEMESTER-II)**

#### **DSC-4: Analytical Geometry**

##### **Course Outcomes:**

CO1: After successful completion of this course students can able to Study and analyse Geometry of two dimensions.

CO2: Learners can compute angle between two planes and lines

CO3: Learners can compute tangent to given Sphere

CO4: Student can study various forms of Sphere

#### **DSC-5: Lab Course-II(Integral Calculus)**

##### **Course Outcomes:**

After Successful completion of this course students can

CO1: Discuss integral as limit of sum and apply fundamental theorems of Integral Calculus.

CO2: Study Beta and Gamma Functions.

CO3: Do multiple integrations.

CO4: Study application of Multiple integral.

#### **GE/OE : Basic Algebra**

##### **Course Outcomes:**

After Successful completion of this course students can

CO1: Understand matrices and determinants.

CO2: Solve system of linear equations.

CO3: Calculate rate of interest .

CO4: Solve LPP and apply it in real life problems.

#### **SEC-**

#### **Programming Using MATLAB/Scilab**

##### **Course Outcomes:**

After successful completion of this course students are able to:

CO1: Do programming using MATLAB

CO2: Define function and function files

CO3: Plot two dimensional graphs



CO4: Plot three dimensional plots.

**B.A./B.Sc. (Mathematics)**

**CHOICE BASED CREDIT SYSTEM (CBCS) SEMESTER PATTERN**

**Semester III**

**CCM-3, Section-A Paper VI: Real Analysis-I**

**Course Outcomes:** After successful completion of the course student will be able to

1. Understanding the basic concept of sets and their properties.
2. Understanding the concept of a neighborhood of a point, interior points of a set, open set.
3. Understanding concept of limit points of a set, closed set, closure of a set, dense set.
4. Understanding the basic concept of sequences, subsequences, bounds of sequences, limit point of sequences, general principle of convergence, different types of sequences.
5. Understanding the concept of infinite series, different types of series, the general principle of convergence
6. Use the results to solve some problems.
7. Understanding the difference between different types of sequences, series, and comparison tests.

**CCM-3, Section B Paper VII: Group Theory**

**Course Outcomes:** After successful completion of the course student will be able to

1. Understand the concepts on an equivalence relation.
2. Find the examples of equivalence relation.
3. Check whether the given set, is a group for the given operation or not.
4. Understand the general properties of groups.
5. Solve problems on groups.
6. Understand the concepts of the cyclic group.
7. Use Lagrange's theorem to solve the problems in number theory.
8. Form a quotient group.
9. Find the kernel of a group homomorphism.

**CCM-3, Section-C Paper VIII: Ordinary Differential Equations**

**Course Outcomes:** After successful completion of the course student will be able to

1. Understanding concept of solution of differential equations, order and degree.
2. Transform the equations into variable separable form.
3. Transform first-order non-homogeneous equation in  $x$  and  $y$  to homogeneous equation in  $x$  and  $y$  and solve it.
4. Find the equations that can be resolved into components equation and solve it.
5. Solve Clairaut's equation.
6. Find the solutions when the auxiliary equations are equal, different, repeated, and imaginary roots.
7. Find the solution of the exact differential equation, rules of finding the integrating factor.



8. Transform non-linear equation to linear equation and solve it.
9. Find integral corresponding to a term of the form  $e^{ax}$ ,  $x^m$ ,  $\sin ax$  or  $\cos ax$ ,  $e^{ax}V$ ,  $x^mV$ ,  $x^2V$  in the second member.
10. Find the solution of linear equation with variable coefficients.
11. Transform the equations to the homogeneous linear form.
12. Transform the homogeneous linear equation with constant coefficient by changing the independent variable  $x$  to  $z$  by putting  $x = e^z$  or  $Z = \log x$

#### Semester-IV

##### CCM-4 Section-A Paper IX: Real Analysis-II

**Course Outcomes:** After successful completion of the course student will be able to

1. Understand the meaning of interval, subinterval, partitions, and their refinement.
2. Understanding the basic concept of upper integral and lower integral and Riemann integral.
3. Understanding difference between upper sum, lower sum and Riemann sum
4. Acquire the idea about Riemann Integrability and Riemann Integration
5. Understand various theorems associated with Riemann Integration
6. Develop a knowledge about Riemann Integration and applies to problems
7. Understand the meaning of improper integral.
8. Determine convergence of improper integrals with discontinuities in their domain or infinite limits of integration.
9. Develop skill in checking the convergence of improper integral using various tests of convergence
10. Understanding distinguishes between convergence and absolute convergence of improper integral.
11. Use comparison test with a corresponding improper integral with other improper integral to decide whether improper integral converge or diverge
12. Use the results to solve some problems.

##### CCM-4, Section-B Paper X: Ring Theory

**Course Outcomes:** After successful completion of the course student will be able to

1. Understand given algebraic structure is a Ring or not.
2. Construct the examples of ring with known examples of ring.
3. Differentiate between zero-divisors and non-zero-divisors in a given ring.
4. Check whether given two rings are isomorphic or not.
5. Check whether the given ideal of a ring is a principal ideal or not.
6. Understand the concepts on principal ideal ring
7. Understand concepts on Euclidean rings.

##### CCM-4, Section-C Paper XI: Partial Differential Equations

**Course Outcomes:** After successful completion of the course student will be able to

1. Classification of PDE.



2. Solve linear as well as non-linear PDE of first and second order.
3. Apply PDE techniques to predict the behavior of certain phenomena.
4. Solve real problems by identifying them approximately from the perspective of PDE.
5. Mathematical formation of real problem precisely.
6. Solve problem using boundary conditions.

**B.A./B.Sc. (Third Year) (Mathematics)**

**CHOICE BASED CREDIT SYSTEM (CBCS) SEMESTER PATTERN**

**Semester-V**

**DSEM-5, Section-A Paper XII: Metric Spaces**

**Course Outcomes:** After successful completion of the course student will be able to

1. Demonstrate an understanding of metric spaces and subspaces by proving unseen results.
2. Produce examples and counterexamples illustrating the mathematical concepts.
3. Understand the concepts of open and closed sets.
4. Understand the concepts and develop skill to check the positions of a point in the space.
5. Understand the concepts of convergences and completeness.
6. Understand the concepts of fixed point and Banach principle.
7. Understand the concepts of continuity and uniform continuity.
8. Understand the concepts of compact and non-compact sets with various properties.
9. Understand the concepts of Lebesgue Number for Covers and connectedness of sets.
10. After completion of this course student can aware with basic concepts of functional analysis.

**DSEM-5, Section-B Paper XIII: Linear Algebra**

**Course Outcomes:** After successful completion of the course student will be able to

1. Understand and prove algebraic statements about vector spaces, subspaces, basis, Inner product spaces.
2. Determine a basis and the dimension of finite dimensional space.
3. Understand and prove statements about linear transformations.
4. Find the kernel, range, rank and nullity of linear transformation.
5. Determine Eigen values and Eigen vectors.
6. Interpret a matrix as a representation of linear transformation.

**DSEM-5, Section-C Paper XIV (A): Operation Research**

**Course Outcomes:** After successful completion of the course student will be able to

1. Formulate a given simplified description of a suitable real-world problem as a linear programming.
2. Sketch a graphical representation of a two-dimensional linear programming problem.
3. Solve a two-dimensional linear programming problem graphically
4. Use the simplex method to solve simple linear programming models by hand.
5. Understanding transportation problem and solve simple assignment problems.

**DSEM-5, Section-C Paper XIV (B): Mechanics-I (Statics)**



**Course Outcomes:** After successful completion of the course student will be able to

1. Understand concepts of motion, force and its importance in Physical Sciences.
2. After learned this course , Student will be interested in Applied Mathematics.
3. Develop research oriented skills in Applied Mathematics
4. Know the principles of equilibrium of two forces.
5. To realize the forces acting on a particle , forces acting on a rigid body and its derivations.
6. Analyze the equilibrium state of a particle and rigid body.
7. Obtain the equivalent force - couple system of a given system.

#### **DSEM-5, Section-C Paper XIV(C): Numerical Analysis**

**Course Outcomes:** After successful completion of the course student will be able to

1. Estimate the value of a function under certain assumptions.
2. Find the missing terms in the given data using numerical techniques.
3. Apply numerical derivation and numerical integration methods.
4. Investigate numerical solutions of differential equations.
5. Find the integration of a functions using numerical methods.
6. Find the solutions of ordinary differential equations.

#### **Semester-VI**

#### **DSEM-6, Section-A Paper-XV: Complex Analysis**

**Course Outcomes:** After successful completion of the course student will be able to

1. Operate basic mathematical operations with complex numbers in Cartesian and polar forms.
2. Demonstrate the ability of limit, continuity, analyticity of a function.
3. Find the derivative and integral of a complex variable function.
4. Work with exponential and logarithmic functions.
5. Use Cauchy integral theorem and Liouville's theorem.
6. Use Taylor and Laurent's series.

#### **DSEM-6, Section-B Paper XVI: Integral Transforms**

**Course Outcomes:** After successful completion of the course student will be able to

1. Understand the concept of Integral Transforms
2. Identify integral transforms by their integration limits and kernels
3. Obtain integral transforms of functions
4. Know the formulae for integral transforms of standard functions
5. Understand various properties of integral transforms
6. Apply the integral transforms for evaluating integrals
7. Apply the integral transforms along with their inversion formulae for solving differential equations with initial conditions



8. Apply the integral transforms along with their inversion formulae for solving systems of simultaneous differential equations with initial conditions

**DSEM-6, Section-C Paper XVII(A): Topology**

**Course Outcomes:** After successful completion of the course student will be able to

1. Understand Concept of Topological spaces.
2. Understand Topological Properties of Sets.
3. Understand the concept of order Topology and product topology.
4. Understand concept of Subspace topology.
5. Understand Concept of Closed and Open sets, limit points.
6. Understand of continuity, Concept of Homeomorphisms, Imbedding's.
7. Understand the separation properties like Hausdroff Spaces and T1 Axioms.
8. Understand basic Concept of Connected Spaces and compact Spaces.
9. Understand Utility of Connected and compactness.

**DSEM-6, Section-C Paper XVII (B): Mechanics-II (Dynamics)**

**Course Outcomes:** After successful completion of the course student will be able to

1. Understand Newton's Laws of Motion and its importance in Physical Sciences.
2. Develop research oriented skills in Applied Mathematics.
3. Understand the expressions for Velocity and Acceleration, Components of Velocity and Acceleration and principles of equilibrium of two forces.
4. To realize the forces acting on a particle , forces acting on a rigid body and its derivations.
5. Analyze the Impulsive Force and its Impulse, Conservation of Linear Momentum and , Impact of two bodies.
6. Find the Motion of Projectile and Derivation of Equation of its trajectory, Cartesian Equation of the path of Projectile, equivalent force - couple system of a given system.

**DSEM-6, Section-C Paper XVII(C):Elementary Number Theory**

**Course Outcomes:** After successful completion of the course student will be able to

1. Apply different methods of proofs including induction, contradiction, counter examples to verify mathematical assertions.
2. Explain basic concepts like divisibility, greatest common divisor, congruences, linear congruences.
3. Solve systems of Diophantine equations using the Euclidean algorithm and Chinese remainder theorem
4. Demonstrate knowledge and understanding of prime numbers.
5. Use Fermat's theorem and Wilson's theorem.

**SPHYCT1101: Fundamentals of Physics I****Course Outcomes:**

- Students will be able to understand the fundamental nature of Physics.
- Students will be enabled to handle different types of problems and other advanced courses in Physics and Chemistry.

**SPHYCP1101: Practical- I (based on Fundamentals of Physics I)****Course outcomes:**

- ✓ Students will be able to understand different concepts and principles of Physical instrumentations.
- ✓ Student will learn about validity of concepts by doing the experiment.

**SPHYSC1101 (Skill): Computational Physics****Course outcomes:**

- ✓ This course being pre requisite for many advance courses hence students will be able to learn hand on experiments, program designing.
- ✓ Students will be made aware with computer systems and its functioning.

**SPHYGE1101 (Generic Elective): Renewable Energy****Course outcome:**

- ✓ After completing this course the students will gain knowledge of various non-conventional energy sources.
- ✓ Students will be able to understand use of renewable energy sources in day to life.
- ✓ Hand on experiments will provide them an expertise to resolve the basic issues of functioning of renewable energy source.
- ✓ Students will be trained to harvest non-conventional energy sources and design their own gadgets to convert and use them for their house hold purposes.

**Semester II****SPHYCT1151: Fundamentals of Physics II****Course Outcomes:**

- Students will be able to understand the fundamental nature of Physics.
- Students will be enabled to handle different types of problems and other advanced courses in Physics.

**SPHYCP1151: Practical-II (based on Fundamentals of Physics II)****Course outcomes:**

- ✓ Students will be able to understand different concepts and principles of Physical instrumentations.
- ✓ Student will learn about validity of concepts by doing the experiment.

**SPHYSC1151 (Skill): Electrical Measurements****Course outcome:**

- After completing this course the students will gain knowledge of various electrical



gadget installations at domestic levels. .

- Students will be able to understand wiring systems and electrical connections of different phases at house hold appliances.
- Hand on experiments will provide them an expertise for electrical installations, maintenance and wiring repairs.

### **SPHYGE1151 (Elective): Wonders in the Sky**

#### **Course outcome:**

- ✓ Identify the objects visible to the unaided eye in the night sky
- ✓ Explain the phenomenon like seasons on earth, solar and lunar eclipse
- ✓ Explain the dynamics of planet in solar system, use the orbital properties to estimate mass of the sun
- ✓ Compare and contrast the terrestrial planets and the Jovian planets
- ✓ Derive the scientific understanding and explain the observed properties of stars and estimate their temperature, mass, size etc
- ✓ Describe the scale of universe and relative sizes of the different objects within the Universe
- ✓ Describe the Earth's place in the solar system, Galaxy and Universe

#### **Major in Microbiology and Minor in DSM (Subject)**

### **UNDERGRADUATE PROGRAMME OF SCIENCE & TECHNOLOGY**

**(As per NEP-2020)**

**(Revised as per the Govt. Of Maharashtra circular Dt. 13th March 2024)**

**Effective from the Academic year 2024-2025**

#### **PROGRAMME OBJECTIVES:**

- To enrich students with knowledge and understanding of the different disciplines of Microbiology such as medical Microbiology, immunology, biochemistry, fermentation technology, environmental Microbiology, genetics, agricultural and food Microbiology, Waste management.
- To make students learn advanced fields of microbiology such as Nanobiotechnology and Marine microbiology.
- To introduce the concepts of application and research in Microbiology and inculcate sense of scientific responsibilities.
- To help student's build-up a progressive and successful career in Microbiology.
- To take a step ahead for the holistic development of students through activities like lectures from eminent personalities, Visits, and various competitions.
- It makes the students competent enough to use Microbiology knowledge and skills to analyze problems involving microbes and undertake remedial measures.
- In addition, students are to be trained to use this knowledge in day-to-day applications and get a glimpse of research.





- The students graduating in B.Sc. Microbiology degree must have thorough understanding the fundamentals of Microbiology as applicable to wide ranging contexts.
- They should have the appropriate skills of Microbiology so as to perform their duties as microbiologists.
- They must be able to analyze the problems related to Microbiology and come up with most suitable solutions.
- As Microbiology is an interdisciplinary subject the students might have to take inputs from other areas of expertise. So, the students must develop the spirit of team work.

#### **PROGRAM SPECIFIC OBJECTIVES [PSOB]: Programme Specific**

##### **Objectives for B.Sc. Microbiology are as follows:**

- **PSOB-1.** The broad goal of the teaching to under graduate students in Microbiology is to provide knowledge and skills in Microbiology to develop practical skills through the laboratory work, their presentation and articulation skills, exposure to industry and interaction with industry experts, write short research - based projects.
- **PSOB-2.** To learn basic concepts of amazing world of Microorganisms, Techniques in Microbiology, basics of Bacteriology, Cultivation, and growth of Micro-organisms.
- **PSOB-3.** To understand concepts of Medical Microbiology, Epidemiology, Immunology, Bacterial Physiology, Fermentation Technology, Bacterial Genetics, Air, Water and Soil Microbiology.
- **PSOB-4.** To strengthen the fundamentals of various fields of Microbiology.
- **PSOB-5.** To develop scientific aptitude and motivate students to take up higher studies like B. Sc. (Hons. / Hons. with Research) microbiology and Research.
- **PSOB-6.** To realize and appreciate the applicability of knowledge and Interdisciplinary approach in everyday life.
- **PSOB-7.** The graduate students of microbiology should have basic skills such as culturing microbes, maintaining microbes, safety issues related to handling of microbes, Good Microbiological practices etc.

##### **PROGRAMME SPECIFIC OUTCOMES [PSOC]: Programme specific outcomes for B.Sc. Microbiology are as follows:**

- > **PSOC-1.** The student will be able to explain various fields of Applied Science including Medicine, Pharmacy, Cell biology, Biotechnology, Industrial Production, Biochemistry, Nanotechnology, Environmental Management, Food, Dairy, Immunology, Agriculture and Bioinformatics
- > **PSOC-2.** The students will be able to design and execute experiments related to Basic Microbiology, Immunology, Molecular Biology, Recombinant DNA Technology, and Microbial Genetics, etc.
- > **PSOC-3.** The students will be able to execute a short research project incorporating techniques of Basic and Advanced Microbiology under supervision.



- **PSOC-4.** The students will be able to acquire sound knowledge of classification, taxonomy, structure, types of microorganisms and various fields of microbiology.
- **PSOC-5.** The students will be able to do experiment in microbiology laboratory to identify the microorganisms in various samples including clinical, environmental, water and food samples.
- **PSOC-6.** The students will be able to acquire knowledge about various diseases thereby can create awareness to the public.
- **PSOC-7.** The students will be able to provide knowledge on food processing, and fermented food products.
- **PSOC-8.** The students will be able to utilize various agricultural waste, marine sources as raw material for production of various fermented products to reduce accumulation of waste in the environment.
- **PSOC-9.** The students will be able to check the quality of water, dairy and food products by various learnt microbiological techniques
- **PSOC-10.** The students will be able to provide knowledge about history of Microbiology and contribution of various scientists. branches of Microbiology, basic structure of organism in details, microbial nutrition requirement for organism and microbial growth, microbiological techniques and control, different type of staining techniques used to distinguish between different type of bacteria and its organelles.
- **PSOC-11.** The students will be able to acquire knowledge about the different types of bacteria and viruses, microbial interaction, prevention of food from spoilage, preservation of food from food borne disease and food standards. also study the testing and preservation of milk and milk product in dairy industries.
- **PSOC-12.** The students will be able to acquire knowledge about the basic structure like Nucleic acid, carbohydrates metabolism, amino acids, enzymology in details and various vitamins. also study the fermentation at industrial level and upstream and downstream processing of fermentation
- **PSOC-13.** The students will be able to acquire knowledge about different types of metabolic pathways and its regulation related to carbohydrates amino acid. also study about different type of waste water treatment methods and water testing methods. this also cover air and agriculture microbiology with bioremediation and biomagnification.
- **PSOC -14.** The students will be able to acquire knowledge about the epidemiology and host parasites, disease transmitted and their various sources, control and prevention & spreading of infection, learn about normal flora present in body, study of pathogenic and non-pathogenic organism, morphology, cultural and biochemicals characteristic, pathogenesis, serology test and lab diagnosis, gene mutation and regulation of gene.
- **PSOC-15.** The students will be able to acquire knowledge about Immunity, various defense mechanism, organs of immune system, adaptive immunity, and cell mediated immune response.



tools and techniques of genetic engineering. also come to know about health care, agriculture, and industrial biotechnology.

➤ **PSOC-16** The students will be able to Explain why microorganisms are ubiquitous in nature; inhabiting a multitude of habitats and occupying a wide range of ecological habitats, their role in these ecological niches, influence of microbiome on our health, environmental cleanup, variety of industrial product development, and their significance in human wellbeing.

➤ **PSOC-17.** The students will be competent enough to use microbiology knowledge and skills to analyze problems involving microbes, learning use of microbes as a model organisms to understand facts about living systems, analyze the genetic makeup of different types understand of microbes, articulate these with peers/ team members/ other stake holders through effective communication, and undertake remedial measures/ studies etc.

➤ **PSOC-18.** The students will take up a suitable position in academia or industry and to pursue a career in research.

➤ **PSOC-19.** The students will be able to develop their skills to start small scale business in various microbiological laboratories and in the field of research and health.

#### (Semester – I)

#### **Core Theory Course: Microbiology Course Name: Basic Microbiology**

**Course Code :SMICCT1101**

#### **Course outcomes:**

- Students have the acquaintance of concept of microbiology and its scope in different fields.
- Students comprehend the historical developments in microbiology field.
- Students get acquainted with microscopes used in Microbiology Laboratory.
- Students have the expertise in the staining techniques,
- Students get acquainted with ultrastructure of bacteria.

#### **Course Name: Practicals based on Course SMICCT1101**

**Course Code :SMICCP1101**

#### **Course outcomes:**

- Students have acquainted the skill and technique for handling microscope.
- Students developed the skill and technique for staining the bacteria and their structural components.

#### **Generic Elective Course: Microbiology Course Name: Fundamentals of Hygiene**

**Course Code :SMICGE1101**

#### **Course outcomes:**

Students should be able to,

- Practice own personal, community and public hygiene
- Evaluate food safety and incorporate in daily life.
- Implement Public Hygiene standards with the help of digital media.
- Implement good hygiene practices regularly in society.

**Skill Enhancement Course: Microbiology****Course Name: Fundamental Microbiology Laboratory Techniques****Course Code :SMICSC1101****Course outcomes:**

- Students have the skill to handle different instruments used in microbiology laboratory.
- Students comprehend the skill for preparation of different types of culture media used for cultivation of bacteria.
- Students get acquainted with skill for isolation of bacteria by using different techniques.

**Core Theory Course: Microbiology Course Name: Microbial Physiology****Course Code :SMICCT1151****Course outcomes:**

- Students have the acquaintance about the sterilization techniques.
- Students have the expertise in the microbial cultivation techniques,
- Students get acquainted with microbial growth, reproduction, and sporulation.

**Core Practical Course: Microbiology****Course Name: Practicals based on Course SMICCT1151****Course Code :SMICCP1151****Course outcomes:**

- Students have acquainted the skill and technique for handling different instruments in Microbiology Laboratory.
- Students developed skill and technique for preparation of media and isolation of bacteria by different methods from different sources.
- Students developed the skill and technique for studying the effect of environmental factors on the growth of bacteria.

**(Semester – II)****Generic Elective Course: Microbiology****Course Name: Microorganisms for Human Welfare****Course Code :SMICGE1151****Course outcomes:**

- Students get acquainted with fermented food prepared from Wheat.
- Students get acquainted with fermented food prepared Milk and Vegetables.
- Students get acquainted with fermented food prepared from Legumes and Oil Seeds.
- Students get acquainted with fermented food prepared from Grape.

**Skill Enhancement Course: Microbiology****Course Name: Physiological and Biochemical Laboratory Techniques****Course Code :SMICSC1151****Course outcomes:**

- Students have the skill of determining the motility of the bacteria.



- Students comprehend the skill for testing the effect of environmental factor on environmental factor on bacterial pigment formation.
- Students get acquainted with skill and technique for biochemical analysis of Bacteria.
- Students get acquainted with skill for the microscopic measurement of Cyanobacteria, Bacteria, and yeast.

**B. Sc. Second Year**  
**Faculty of Science and Technology**  
**Subject: Microbiology**  
**Semester Pattern effective from June – 2020**  
**Semester – III**

**Paper Name: Applied Microbiology (P-VI) CCMB III (Section A)**

**Paper Number: VI**

**Course Outcome:**

Applied microbiology trains students for gaining expertise in the microbial world and the way it interacts with humans. It looks at how we can harness and utilize the powers of the microbes in areas ranging from air, water and sewage microbiology to Milk Microbiology and extends to industrial applications. A wide range of microbial by-product production, quality assessment and health hazard monitoring is possible by students who get well versed in this course.

**Paper Name: Immunology (P-VII) CCMB III (Section B)**

**Paper Number: VII**

**Course Outcome:**

Understand the basic components of the immune system and how this system serves to protect the host against disease-causing microbes. Understand Concept related to cells and organs related to immune system, Immunity, Immune response and immune mechanism of both Immunity & Hypersensitivity.

**(Semester – IV)**

**Paper Name: Food, Soil Microbiology and Microbial Ecology (P-VIII) CCMB IV (Section A) Paper Number: VIII**

**Course Outcome:**

To apply the knowledge of microorganisms causing food spoilage, pathogens that may cause disease post cooked or storage, those used to produce fermented foods such as cheese, yogurt, bread, beer, and wine, meat and meat products, fruits vegetables and those with other useful roles such as producing probiotics. Understand of principles of soil science, microbiology, and the chemistry and physics of natural elemental cycles, which maintain the balance of our ecosystem. Describe significance of soil fertility, appreciate role of soil microorganisms which play essential roles in the nutrient cycles that are fundamental to life on the planet. Illustrate and explain how microbes are responsible for cycling nutrients through the environment, creating important



symbiotic relationships, providing energy in the absence of sunlight, and digesting the food we eat.

**Paper Name: Medical microbiology (PIX) CCMB IV (Section B)**

**Paper Number: IX**

**Course Outcome:**

Impart Knowledge of the diverse places where microbiology is involved. Understanding of diverse Microbiological processes. Basic skills such as culturing microbes, maintaining microbes, safety issues related to handling of microbes, Good Microbiological practices etc. Moderately advanced skills in working with microbes such as Pathogens.

**Paper Name: Annual Practical's based CCMBP II [CCMB III & IV (Section A)]**

**Paper Number: Practical's based on P-VI & P-VIII (P-X)**

**Course Outcome:**

Acquire skills of handling microorganisms in the laboratory and study their characteristics. Has developed laboratory skills in isolating and detecting microbes from soil and water. Laboratory skills of testing microbial load in Food and milk. Has developed skills for growing microorganisms in the laboratory to produce different enzymes

1. Bacteriological examination of air by Solid Impingement Techniques.
2. Bacteriological examination of water: Quantitative analysis: MPN method
3. Bacteriological examination of water: Qualitative analysis: Presumptive, Confirmatory, Completed test,
4. Differentiation between fecal and non-fecal coliforms by IMViC test
5. Elevated temperature test (Ejeckman test).
6. Determination of R: S ratio.
7. Demonstration of Ammonification
8. Demonstration of Nitrification
9. Demonstration of Phosphate solubilization
10. Isolation and study of Rhizobium species from root nodules of leguminous plants.
11. Isolation and study of Azotobacter sp. from soil
12. Bacteriological analysis of milk: MBRT
13. Bacteriological examination of food by SPC method
14. Bacteriological examination of food by DMC method
15. Alkaline phosphatase test to check pasteurization of milk

**Paper Name: Annual Practical's based CCMBP III [CCMB III & IV (Section B)]**

**Paper Number: Practical's based on P-VII & P-IX (P-XI)**

**Course Outcome:**

Acquire skills of handling microorganisms in the laboratory and study their characteristics. Has developed laboratory skills in detecting enzymes antigen and antibodies using diagnostic kits Laboratory skills of staining blood and enumerate RBCs and WBCs in whole blood. Has



developed skills for growing Pathogenic microorganisms in the laboratory and identifying them on basis of various biochemical tests and perform antibiotic sensitivity tests.

1. Blood staining by Leishman's / Giemasa's method
2. Metachromatic granule staining (Albert's Method)
3. Acid fast staining
4. RBC counting
5. WBC counting
6. Blood grouping
7. Widal test: Qualitative and Quantitative by slide method
8. RPR test
9. Gel diffusion test (Demonstration)
10. Isolation and Study of Morphology, Cultural and Biochemical characteristics of the Salmonella sp.
11. Isolation and Study of Morphology, Cultural and Biochemical characteristics of the Vibrio cholerae
12. Isolation and Study of Morphology, Cultural and Biochemical characteristics of the Staphylococci
13. Study of bacterial flora of skin by swab methods
14. Antibiotic sensitivity tests for above pathogens by disc diffusion method
15. Coagulase test

**Paper Name: Public Health Microbiology SECMB - I (Section A)**

**Paper Number: SECMB - I**

**Course Outcome:**

Have developed a very good understanding of practical aspects diagnosis of common human waterborne infections, preventive measures for human waterborne infections by the use of antibiotics and vaccines, Gain skills food and milk quality testing.

**Paper Name: Microbial Biofertilizers SECMB - I (Section B)**

**Paper Number: SECMB - I**

**Course Outcome:**

Have developed a very good understanding of practical aspects production of biofertilizers.

**Paper Name: Diagnostic Microbiology SECMB - II (Section A)**

**Paper Number: SECMB - II**

**Course Outcome:**

Have developed a very good understanding of practical aspects of collection of different clinical samples, their transport, culture and examination by staining, and molecular and immunological diagnostic methods for diagnosis of microbial diseases.

**Paper Name: Medical Laboratory Techniques SECMB - II (Section B)**

**Paper Number: SECMB - II**

**Course Outcome:**

Have developed a very good understanding of practical aspects of collection of different clinical samples, their transport, culture and examination by staining, and molecular and immunological diagnostic methods for diagnosis of microbial diseases.

**B. Sc. Third Year****Subject: Microbiology****CBCS Semester Pattern effective from June -2021****Semester- V****Specific Program Outcome:**

The aim of the undergraduate degree in Microbiology is to make students knowledgeable about the various basic concepts in wide-ranging contexts, which involve the use of knowledge and skills of Microbiology and acquire knowledge and understanding of the microbiology concepts as applicable to diverse areas such as medical, industrial, environment, genetics, agriculture, food and others. Their understanding, knowledge and skills in Microbiology needs to be developed through a thorough teaching learning processes in the class, practical skills through the laboratory work, their presentation and articulation skills, exposure to industry and interaction with industry experts, write short research-based projects where they are guided and mentored by the academic and other experts of the subject. The student should have developed competency to demonstrate key practical skills in working with microbes for study and use in laboratory as well as outside, including the use of good microbiological practices and also developed broad perspective of the discipline of Microbiology to enable him to identify challenging society problems and plan his professional carrier to develop innovative solutions for such problems.

**Specific Course Outcome:**

Microbial Genetics course makes students to understand the evidence given to prove DNA and RNA as genetic material, properties of DNA as genetic material, and structure of prokaryotic chromosome. They also comprehend knowledge of the DNA replication process in prokaryotes, genetic recombination, and genetic material transfer among the microorganisms through transformation, conjugation and transduction.

**Paper Name: Microbial Metabolism DSEMBI (Section B I)****Paper Number: XIII A****Course Outcome:**

Microbial Metabolism course makes students to get the knowledge of enzymes, physicochemical properties of enzymes, nomenclature and classification of enzymes, mechanism of action of enzyme and factors affecting the enzyme activity. Students become capable of differentiating the catabolic and anabolic process and also defining the role of different pathways in generating the ATP, different fermentation products such as ethanol, lactic acid etc.

**Paper Name: Nitrogen Metabolism DSEMBI (Section B II)**



**Paper Number: XIII B****Course Outcome:**

Nitrogen Metabolism course makes students understand

- The role of nitrogen fixers in environmental Nitrogen Cycle,
- Microbiology and biochemistry of oxidation of Ammonia, Nitrite and Denitrification.
- Biosynthesis of purine, pyrimidine, and catabolism of nucleotides
- Different pathway to synthesis the amino acids

**Semester: VI****Paper Name: Molecular Biology DSEMBII (Section A )****Paper Number: XIV****Course Outcome:**

Molecular Biology course makes students understand

- Characteristics of genetic code, structure of RNAP and ribosome, and gene expression in term of transcription and translation process
- The concept of mutation, types of mutation and repair of DNA
- Gene regulation at transcriptional and translational level, the Lac Operon and Trp Operon of E. coli
- Tools and the methods for genetic engineering

**Paper Name: Industrial Microbiology DSEMBII (Section B I)****Paper Number: XV A****Course Outcome:**

By Industrial Microbiology course the students

- Are capable of describing a large number of substrates that are used for the industrial fermentation processes
- Have developed an understanding of different types of reactors or fermenters which are used for laboratory, pilot and industrial scale fermentations and their processes parameters.
- Has acquired a fairly good knowledge of how microbes are used in the fermentative production of organic acids, alcohols, enzymes, antibiotics and various foods in the industry
- Has acquired knowledge of various physical parameters which affect production of industrial products by the microorganisms and the safety aspects of the production and use of these products.

**Paper Name: Pharmaceutical Microbiology DSEMBII (Section B II)****Paper Number: XV B****Course Outcome:**

By Pharmaceutical Microbiology course the students

- Acquired detailed knowledge of antimicrobial agents, their chemical nature, and mechanism of action and basis of resistance of microbes to these antimicrobials, formulations involving different antimicrobials, stabilization of formulations



- Developed understanding of different types of disinfectants/antiseptics and their specific uses, and evaluation of their bactericidal and bacteriostatic actions, basic knowledge of cell cultures.
- Developed practical skills for testing pharmaceutical products for sterility testing and pyrogenicity testing using different methods

**Paper Name: Practicals Based on P – XII & P – XIV  
(DSEMBP I [DSEMB I & II Section A])**

**Paper Number: XVI**

**Course Outcome:**

By this annual practical course, the students

- Acquired the practical skill for extraction, purification, and study of DNA Profile.
- Developed understanding and skill for studying the effect of different mutagens on growth of E. coli
- Acquired the practical skill for extraction and purification of RNA from S. cerevisiae
- Developed understanding and skill for studying genetic material transfer by conjugation and transduction
- Developed practical skills for determination of MIC and LD50 of Streptomycin

**Paper Name: Practicals Based on P – XIII A & B & P – XVA & B  
(DSEMBP II [DSEMB I & II Section B I & II])**

**Paper Number: XVII**

**Course Outcome:**

By the end of this annual practical course, the students

- Have acquired the skill for primary screening of antibiotic producer, amylase producer and organic acid producer.
  - Have acquired a detailed knowledge and skill of number of products which are produced by industrial fermentation processes, like citric acid, penicillin, wine etc.
  - Have acquired the knowledge to study the enzymes, production of enzymes
1. Estimation of reducing sugar by Sumner's method.
  2. Estimation of Amino acids by Rosen's method
  3. Study of enzymes (Lecithinase, Gelatinase, Urease, Caseinase, Catalase)
  4. Fermentative production of Production of amylase
  5. Effect of various physicochemical parameters on amylase activity (pH, Temp)
  6. Primary screening of antibiotic producers, amylase producers, organic acid producers
  7. Production of Penicillin (Surface / submerged)
  8. Fermentative production of Wine & and its estimation by Titrable acidity
  9. Production of Citric acid (Surface / submerged) & its estimation by Titrable acidity
  10. Production of Biofertilizer (Azotobacter)
  11. Bioassay of Penicillin
  12. Bioassay of therapeutic enzyme glucose oxidase



13. Determination of antimicrobial activity of chemical compound (Phenol)
14. Sterility testing by using *Bacillus stearothermophilus* / *Bacillus subtilis*

**Semester: V**

**Paper Name: Enzyme Technology (SECMBIII A)**

**Paper Number: Skill - III**

**Course Outcome:**

By the end of this skill course, the students

- Have developed a particularly good understanding of sources of enzymes and their applications in various fields.
- Have developed skill for isolation, Purification, and Immobilization of enzymes.
- To understand the importance of enzymes in day today life.

**Paper Name: Molecular Biology Techniques (SECMB III B)**

**Paper Number: Skill - III**

**Course Outcome:**

By the end of this skill course, the students

- Have acquired good understanding of enzymes involved in genetic engineering, hybridization techniques, cloning vector, cloning methodologies.
- Have acquired the skill required for handling procedures of genetic engineering.

**Semester: VI**

**Paper Name: Bioprocess Technology (SECMB IV A)**

**Paper Number: Skill - IV**

**Course Outcome:**

By the end of this skill course, the students

- Have acquired good understanding of bioprocesses involved in manufacture of agro based products
- Have acquired skill for production of food and dairy products.
- Have acquired good knowledge of industrial waste treatment.

**Paper Name: Good Manufacturing Practices (GMP) (SECMB IVB)**

**Paper Number: Skill - IV**

**Course Outcome:** By the end of this skill course, the students

- Have acquired good understanding of GMP and GLP.
- Have acquired practical skill to carry sterilization of Pharmaceutical Products.

**ENVIRONMENTAL STUDIES (R-2023)**

**UNDER NATIONAL EDUCATION POLICY (NEP 2020)**

**COMMON FOR ALL FACULTIES ALL GRADUATE PROGRAMS**

**VECES 151: Environmental Studies**

**Course Outcomes:**



1. Develop the ability to communicate environmental information and ideas logically and concisely in a variety of forms.
2. Provide an understanding of interactions between people and the environment.
3. Increase an awareness of the importance of living in harmony with the environment.
4. Recognize and evaluate the socio-economic, political and ethical issues in Environmental Science.
5. Foster positive attitudes, values and commitment in identifying, solving and preventing environmental problems.
6. Develop an understanding of how natural resources and the environment affect quality of life and the quest for sustainable development.

**Course Code: IKS -I INTRODUCTION TO INDIAN KNOWLEDGE SYSTEM**  
**Effective from Academic year 2024 – 2025 (As per NEP-2020)**  
**Semester I**

**Course Outcomes:**

1. Explain fundamental principles and concepts of Indian knowledge systems.
2. Analyze contributions to humanities, recognizing cultural and artistic significance.
3. Assess impact of Indian achievements in STEM fields on global knowledge systems

**BACHELOR OF ALL**

**Value Education Course on Constitution of India**

**Under the Faculty of ALL Effective from Academic Year 2024-2025**  
**(As per NEP -2020)**

**Program Objectives of Constitution of India:**

- ✓ To develop the understanding of constitutional fundamental rights and duties, sovereignty and socialism.
- ✓ To aware the students about values of justice, equality, liberty, brotherhood and endeavor to promote fraternity among them.
- ✓ To realize the significance of constitution of India to students from all walks of life and help them to understand the basic concepts of Indian constitution.
- ✓ To understand the functioning of Union, State and Local Governments in Indian federal system.
- ✓ To understand the framework defining fundamental political principles, establishing the structure, procedures, powers and duties of government institutions and sets out fundamental rights, directive principles and the duties of citizens.

**Program Learning Outcomes of Constitution of India:**

At the end of the successful completion of the course, the students will be able to

- ✓ Understand the key aspects and concept of the Indian Constitution.
- ✓ Comprehend the structure and philosophy of the Constitution.



- ✓ Realize the significance of the constitution and appreciate the role of constitution and citizen oriented measures in a democracy.
- ✓ Understand the Fundamental Rights and Duties of the Indian Citizen to instill morality, social values, honesty, dignity of life and their Social Responsibilities.
- ✓ Apply the knowledge on directive principle of state policy.
- ✓ Analyze the History, features, and principles of Indian constitution.

In addition to above more program educational objectives of their own may be added by affiliated Institute. In addition to Program Educational Objectives, for each course of undergraduate program, objectives and expected outcomes from learner's point of view are also included in the curriculum to support the philosophy of outcome based education. I believe strongly that small step taken in right direction will definitely help in providing quality education to the stake holders.

**Paper Code : VECCOI1151 Title- Constitution of India (VEC )**

**Course Outcomes:**

At the end of the successful completion of the course, the students will be able to

- Know the sources, features and principles of Indian Constitution
- Understand historical background of the constitution making and its importance for building a democratic India
- Understand the value of the fundamental rights and duties for becoming good citizen of India
- Understand the structure of executive, legislature and judiciary
- Understand philosophy of fundamental rights and duties of Indian Citizens.
- Understand the making process of Indian Constitution.

  
PRINCIPAL  
Late Ramesh Warpujkar (ACS)  
College, Sonpeth Dist. Parbhani