



# **CANARA COLLEGE**

Managed by Canara High School Association, Mangaluru

Reaccredited by NAAC and Affiliated to Mangalore University

**Mahatma Gandhi Road, Kodialbail, Mangaluru – 575 003, D. K. District, Karnataka**

## **BACHELOR OF SCIENCE (B.Sc.)**

**[B.Sc. (PCM / PMC / BZC)**

**[PEOs, POs, PSOs, COs & GAs]**

**CHOICE BASED CREDIT SYSTEM (CBCS)**

**(Effective from 2019-20 Batch onwards)**

## **BACHELOR OF SCIENCE (B.Sc.)**

### **[B.Sc. (PCM / PMC / BZC)]**

**Motto :**

“Motivate to tackle the great scientific challenges”

**Vision :**

“To develop scientific temper and strive to produce globally competitive and socially responsive citizen.”

**Mission :**

“To provide the practical skill in developing the simple applications, to enrich the students knowledge in the recent trends by imparting comprehensive knowledge with equal emphasis on theory and practices and to enhance the employability.”

**Programme Educational Objectives (PEOs) :**

The three year B.Sc. Degree programme intends to attain the following Programme Educational Objectives :

<b>PEO 1</b>	To find gainful employment in scientific organizations or to find employment in school systems as instructors or administrators.
<b>PEO 2</b>	Pursue masters and doctoral research degrees to work in colleges, universities as professors or as scientists in research establishments.
<b>PEO 3</b>	To enable students to recognize the need for and the ability to engage in life-long learning.
<b>PEO 4</b>	Act as administrators in public, private and government organizations or business administrator with further training and education.
<b>PEO 5</b>	To develop the ability to utilize the mathematical problem solving methods such as analysis, modeling, and programming and mathematical software applications in addressing the practical and heuristic issues.
<b>PEO 6</b>	It also promotes research and creative activities of students by providing exposure to the realm of physical science, life science and technical expertise.

**Programme Outcomes (POs) :**

Students of B.Sc. Degree Programme at the time of graduation will be able to :

<b>PO 1</b>	Acquire the knowledge with facts and figures related to various subjects in Basic Science.
<b>PO 2</b>	Understand the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life.
<b>PO 3</b>	Acquire the skills in handling scientific instruments, planning and performing in laboratory experiments.
<b>PO 4</b>	Provide knowledge about material properties and its application for developing technology to ease the problems related to the society.
<b>PO 5</b>	Understand the interdisciplinary nature of chemistry and to integrate knowledge of mathematics, physics and other disciplines to a wide variety of chemical problems.
<b>PO 6</b>	Employ critical thinking and the scientific method to design, carry out, record and analyze the results of experiments.
<b>PO 7</b>	Build and demonstrate leadership, teamwork and social skills and Communicate effectively in different contexts.

<b>PO 8</b>	Pursue masters and doctoral research degrees to work in colleges, universities as professors or as scientists in research establishments.
<b>PO 9</b>	Find gainful employment in scientific organizations or school systems as instructors or administrators or do the business of creating web sites.
<b>PO 10</b>	Developing deeper understanding of key concepts of biology at biochemical, molecular and cellular level.

#### **Programme Specific Outcomes (PSOs) :**

Upon successful completion of **B.Sc. (PCM)** Programme, the graduates will be able to :

<b>PSO 1</b>	Imbibe ethical, moral and social values in personal and social life leading to highly cultured and civilized personality.
<b>PSO 2</b>	Realize that pursuit of knowledge is a lifelong activity and in combination with untiring efforts and positive attitude and other necessary qualities leads towards a successful life.
<b>PSO 3</b>	Use appropriate tools and techniques for solving simple physical sciences' problems.
<b>PSO 4</b>	Understand good laboratory practices and safety.
<b>PSO 5</b>	Explain the underlying scientific principles that govern the chemical systems.
<b>PSO 6</b>	Development of analytical problem solving skills in the major areas of chemical science.
<b>PSO 7</b>	Pursue higher education and advance research in the field of science.
<b>PSO 8</b>	Develop research oriented skills make aware and handle the sophisticated instruments/equipments.
<b>PSO 9</b>	Find various employments available in industries, scientific organizations or school systems as instructors or administrators.

Upon successful completion of **B.Sc. (PMC)** Programme, the graduates will be able to :

<b>PSO 1</b>	Acquire and demonstrate problem solving skills.
<b>PSO 2</b>	Can be good programmer in industry.
<b>PSO 3</b>	They can be the self-employer.
<b>PSO 4</b>	They can pursue higher studies in MCA.

Upon successful completion of **B.Sc. (BZC)** Programme, the graduates will be able to :

<b>PSO 1</b>	Understand the applications of Plant science, Animal science and Chemistry.
<b>PSO 2</b>	Apply the knowledge and understanding of Science to one's own life and for their career opportunities.
<b>PSO 3</b>	Develop insight and improve analytical, communication and professional skills.
<b>PSO 4</b>	Gains knowledge about research methodology.
<b>PSO 5</b>	Focusing to prepare for higher studies and advance research in frontier areas of Science.
<b>PSO 6</b>	Demonstrate progressive learning in various functional areas of Science.
<b>PSO 7</b>	Contributes the knowledge for Nation building.

**Graduate Attributes (GAs) :**

<b>GA 1</b>	Academic Excellence
<b>GA 2</b>	Professional Efficiency
<b>GA 3</b>	Effective Communication Skills
<b>GA 4</b>	Leadership and Team work
<b>GA 5</b>	Life-Long Learning
<b>GA 6</b>	Creativity and Innovation
<b>GA 7</b>	Environmental Sensitivity and Social Engagement

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### COURSE OUTCOMES (CO)

Course	Details
Code	BSC ENL 131
Title	<b>Compulsory Foundation Course In English</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First / First
Type	Compulsory Foundation Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	5 Lessons+ 5 Poems + 4 Grammar Items
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations,
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To enable the learner to communicate in real-life situations effectively and appropriately.</li> <li>To use English effectively throughout the curriculum for study purposes.</li> <li>To develop interest in and appreciation of Literature.</li> <li>To develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking and writing.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Apply reading with comprehension which help the learners to acquire new vocabulary and content. <b>CO 2 :</b> Read with correct pronunciation, stress, intonation, pause and articulation of voice. <b>CO 3 :</b> Analyze the various elements of poetry, such as diction, tone, form, genre, imagery, figures of speech, symbolism, and theme. <b>CO 4 :</b> Critically examine the value and standard of the poem. <b>CO 5 :</b> Acquire and improve their skills in the four literacy methods: writing, talking, reading and listening. <b>CO 6 :</b> Increase their awareness of the correct use in writing and speaking of English grammar.	



Course	Details
Code	BSC ENL 181
Title	<b>Compulsory Foundation Course In English</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First/ Second
Type	Compulsory Foundation Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	5 Lessons+ 5 Poems + 4 Grammar Items
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations,
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To enable the learner to communicate in real-life situations effectively and appropriately.</li> <li>To use English effectively throughout the curriculum for study purposes.</li> <li>To develop interest in and appreciation of Literature.</li> <li>To develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking and writing.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Apply reading with comprehension which help the learners to acquire new vocabulary and content. <b>CO 2 :</b> Read with correct pronunciation, stress, intonation, pause and articulation of voice. <b>CO 3 :</b> Analyze the various elements of poetry, such as diction, tone, form, genre, imagery, figures of speech, symbolism, and theme. <b>CO 4 :</b> Critically examine the value and standard of the poem. <b>CO 5 :</b> Acquire and improve their skills in the four literacy methods: writing, talking, reading and listening. <b>CO 6 :</b> To increase their awareness of the correct use in writing and speaking of English grammar.	

Course	Details
Code	BSC ENL 231
Title	<b>Compulsory Foundation Course In English</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second/ Third
Type	Compulsory Foundation Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	4 One Act Plays
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations,
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To enable the learner to communicate in real-life situations effectively and appropriately.</li> <li>To use English effectively throughout the curriculum for study purposes.</li> <li>To develop interest in and appreciation of Literature.</li> <li>To develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking and writing.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Identify the story, characters, plot. <b>CO 2 :</b> Identify the author's / characters' viewpoint, attitude or opinion. <b>CO 3 :</b> Enhance Oral and written communication skills like Accuracy and fluency of expression. <b>CO 4 :</b> Master the Mechanics of writing; the use of correct punctuation marks and capital letters. <b>CO 5 :</b> Practice writing through assignments that ask them to plan, draft, revise and edit your essays over time. <b>CO 6 :</b> Apply persuasive techniques used in advertising, specifically, pathos or emotion, logos or logic, and ethos or credibility/character. Learners use this knowledge to analyze advertising in a variety of sources: print, television, and Web-based advertisement.	

Course	Details
Code	BSCKAL 131
Title	<b>Kannada</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First / First
Type	Group III Compulsory Foundation Language – 2
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lecture with Interactive Sessions, discussions, Debate
Evaluation Method	Viva-voce, Assignments, Two Internal Exams, One end term Semester Exam

**Learning Objectives :**

ಜನಪದ, ನಡುಗನ್ನಡ, ದಲಿತ, ವಚನ, ಪ್ರಬಂಧ, ಆಧುನಿಕ ಕವನ, ಲಿಂಗತತ್ವ ಅಲ್ಪಸಂಖ್ಯಾತರ ಬವಣೆ, ಕೃಷಿ ಕ್ಷೇತ್ರ, ಭಾಷೆ ಮತ್ತು ಅರ್ಥ, ಲೇಖನ ಚಿಹ್ನೆ- ಇವುಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ಪಠ್ಯಗಳ ಮೂಲಕ ಅರಿವನ್ನು ಹೆಚ್ಚಿಸುವುದು.

**Expected Learning Outcomes :**

ಪಠ್ಯವನ್ನು ಪೂರ್ಣಗೊಳಿಸಿದ ಬಳಿಕ ವಿದ್ಯಾರ್ಥಿಗಳು :

**CO 1 :** ಸಾಹಿತ್ಯದ ವಿವಿಧ ಪ್ರಕಾರಗಳ ಪರಿಚಯವನ್ನು ಮಾಡಿಕೊಳ್ಳುತ್ತಾರೆ..

**CO 2 :** ಲಿಂಗತತ್ವ ಅಲ್ಪಸಂಖ್ಯಾತರ ಬಗ್ಗೆ ಮಾಹಿತಿಯನ್ನು ಪಡೆಯುತ್ತಾರೆ.

**CO 3 :** ಅಣಕಟ್ಟು ನಿರ್ಮಾಣದ ಮೂಲಕ ಕೃಷಿ ಕ್ಷೇತ್ರ ನಾಶವಾಗುವುದನ್ನು ಅರಿಯುತ್ತಾರೆ.

**CO 4 :** ಭಾಷೆಯ ವಿವಿಧ ಸಾಧ್ಯತೆಗಳ ಕುರಿತು ಜ್ಞಾನವನ್ನು ವಿಸ್ತರಿಸಿಕೊಳ್ಳುತ್ತಾರೆ.

**CO 5 :** ಕನ್ನಡ ಭಾಷೆಯನ್ನು ಸರಿಯಾಗಿ ಬಳಸಲು, ಬರೆಯಲು ಸಮರ್ಥರಾಗುತ್ತಾರೆ.

Course	Details
Code	BSCKAL 181
Title	<b>Kannada</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First / Second
Type	Group III Compulsory Foundation Language – 2
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lecture with Interactive Sessions, discussions, Debate, Enacting Drama
Evaluation Method	Viva-voce, Assignments, Two Internal Exams, One end term Semester Exam

**Learning Objectives:**

ಸಾಂಗತ್ಯ, ಆಧುನಿಕ ಕವಿತೆ, ಕೀರ್ತನೆ, ಪ್ರಬಂಧ, ಪರಿಸರ ಸ್ವೇಚ್ಛೆ ಲೇಖನ, ಬಂಡಾಯ ಕವನ, ಕೊಡವ ಭಾಷಾ ಕವನ, ಆರ್ಥಿಕ ಸಮಸ್ಯೆ, ಸಾಮಾಜಿಕ ಸಮಸ್ಯೆಯ ಕುರಿತ ಲೇಖನ - ಇವುಗಳ ಮೂಲಕ ಜ್ಞಾನವನ್ನು ವಿಸ್ತರಿಸುವುದು

**Expected Learning Outcomes:**

ಪಠ್ಯವನ್ನು ಪೂರ್ಣಗೊಳಿಸಿದ ಬಳಿಕ ವಿದ್ಯಾರ್ಥಿಗಳು:

**CO 1 :** ಭಾಷೆ ಭಾಷೆಗಳ ನಡುವಣ ಅಂತರ್ ಸಂಬಂಧದ ಅರಿವನ್ನುಪಡೆಯುತ್ತಾರೆ.

**CO 2 :** ಮನೋವಿಜ್ಞಾನ, ಪರಿಸರ ಕಾಳಜಿಯ ಬಗ್ಗೆ ಜ್ಞಾನ ವಿಸ್ತರಣೆಯನ್ನುಮಾಡಿಕೊಳ್ಳುತ್ತಾರೆ.

**CO 3 :** ತೆರಿಗೆ ಪದ್ಧತಿಯ ಬಗ್ಗೆ ತಿಳಿದುಕೊಳ್ಳುತ್ತಾರೆ.

**CO 4 :** ಜೀವಿ ಮಕ್ಕಳ ಸ್ಥಿತಿಗತಿಗಳನ್ನು ನಾಟಕ ಪ್ರಕಾರದ ಮೂಲಕ ಅರ್ಥೈಸಿಕೊಳ್ಳುತ್ತಾರೆ.

**CO 5 :** ಮಾನವೀಯ ಮೌಲ್ಯಗಳ ಮಹತ್ವವನ್ನು ತಿಳಿಯುತ್ತಾರೆ.

Course	Details
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Title	<b>Kannada</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second / Third
Type	Group III Compulsory Foundation Language – 2
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lecture with Interactive Sessions, discussions, Debate
Evaluation Method	Viva-voce, Assignments, Two Internal Exams, One end term Semester Exam
<b>Learning Objectives :</b> ಜಲ ಸಂರಕ್ಷಣೆ, ಬಾಹ್ಯಾಕಾಶ ವಿಜ್ಞಾನ,ಹಿರಿಯ ಜೀವಿಗಳ ಬದುಕು,ಜನಪದ ಸಾಹಿತ್ಯ,ದಲಿತ ಸಾಹಿತ್ಯ,ಆಧುನಿಕ ತಂತ್ರಜ್ಞಾನ,ಕೊಂಕಣಿ ಭಾಷೆ ಮುಂತಾದವುಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ಪಠ್ಯಗಳ ಮೂಲಕ ಅರಿವನ್ನು ಹೆಚ್ಚಿಸುವುದು.	
<b>Expected Learning Outcomes :</b> ಪಠ್ಯವನ್ನು ಪೂರ್ಣಗೊಳಿಸಿದ ಬಳಿಕ ವಿದ್ಯಾರ್ಥಿಗಳು: <p><b>CO 1 :</b> ನೆಲ-ಜಲ ,ಸಂಸ್ಕೃತಿ, ಸ್ತ್ರೀ ಲೋಕದ ಬದುಕಿನ ಬಗ್ಗೆ ಅರಿವನ್ನು ಪಡೆಯುತ್ತಾರೆ.</p> <p><b>CO 2 :</b> ಮಾನವ ಬದುಕಿನ ನಶ್ವರತೆಯನ್ನು ಅರ್ಥೈಸುವುದನ್ನು ಕಲಿಯುತ್ತಾರೆ.</p> <p><b>CO 3 :</b> ಬಾಹ್ಯಾಕಾಶ ವಿಜ್ಞಾನದ ಬಗ್ಗೆ ತಿಳುವಳಿಕೆ ಹೊಂದುತ್ತಾರೆ.</p> <p><b>CO 4 :</b> ಹಿರಿಯ ಜೀವಿಗಳ ಸಮಸ್ಯೆಗಳನ್ನು ಅರ್ಥೈಸಿಕೊಳ್ಳುತ್ತಾರೆ.</p> <p><b>CO 5 :</b> ಕನ್ನಡ ಪದಸಂಪತ್ತಿನ ಮೂಲದ ಬಗ್ಗೆ ತಿಳಿದುಕೊಳ್ಳುತ್ತಾರೆ.</p>	

Course	Details
Code	BSCKAL 281
Title	<b>Kannada</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second / Fourth
Type	Group III Compulsory Foundation Language – 2
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lecture with Interactive Sessions, discussions, Debate
Evaluation Method	Viva-voce, Assignments, Two Internal Exams, One end term Semester Exam
<b>Learning Objectives :</b> ಹಳೆಗನ್ನಡ, ತ್ರಿಪದಿ, ಬ್ಯಾರಿ ,ಹವ್ಯಕ ಭಾಷೆ ,ಝನ್ ಬುದ್ಧಿಸಂ ,ಜೀವನ ಚರಿತ್ರೆಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಪಠ್ಯಗಳ ಓದಿನ ಮೂಲಕ ಜ್ಞಾನದ ವಿಸ್ತರಣೆಯನ್ನು ಮಾಡುವುದು.	
<b>Expected Learning Outcomes :</b> ಪಠ್ಯವನ್ನು ಪೂರ್ಣಗೊಳಿಸಿದ ಬಳಿಕ ವಿದ್ಯಾರ್ಥಿಗಳು : <b>CO 1:</b> ಭಾಷೆಯು ಕಾಲದಿಂದ ಕಾಲಕ್ಕೆ ಬೆಳೆದುಬಂದ,,ಬದಲಾವಣೆಗೊಂಡ ಬಗ್ಗೆ ತಿಳುವಳಿಕೆಯನ್ನು ಪಡೆಯುತ್ತಾರೆ. <b>CO 2 :</b> ಸಾಹಿತ್ಯದ ಕುರಿತು ಅರಿವನ್ನು ಗಳಿಸುತ್ತಾರೆ. <b>CO 3 :</b> ಜನಪದ ಹಬ್ಬ ಹರಿದಿನಗಳ ಆಚರಣೆಯ ಮಹತ್ವವನ್ನು ಅರಿಯುತ್ತಾರೆ. <b>CO 4 :</b> ಭಾಷೆಯ ವಿವಿಧ ಸಾಧ್ಯತೆಗಳ ಪರಿಚಯವನ್ನು ಮಾಡಿಕೊಳ್ಳುತ್ತಾರೆ. <b>CO 5 :</b> ತುಳು ಮಹಾಕಾವ್ಯದ ಸೊಗಸನ್ನು ಅರ್ಥೈಸಿಕೊಳ್ಳುತ್ತಾರೆ.	

Course	Details
Code	BSC HDL131
Title	<b>Hindi</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First /First
Type	Group III Compulsory Foundation Language
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total :100
Total Modules	04
Pedagogy	Lectures with explanation in detail for the given syllabus, PPT presentation, Audio visual classes' debates, enacting Drama.
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam and One End Semester Exam
<b>Learning Objectives :</b> To give detailed explanation about prescribed stories and grammar syllabus and the authors views on stories.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Acquire knowledge of Literature of forms <b>CO 2 :</b> Understand the need for moral values in social life. <b>CO 3 :</b> Follow the required Ethics. <b>CO 4 :</b> Understand the grammar required for creative writing in Hindi. <b>CO 5 :</b> Gain insights on the emerging trends in literature.	

Course	Details
Code	BSC HDL181
Title	<b>Hindi</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First / Second
Type	Group III Compulsory Foundation Language
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total :100
Total Modules	04
Pedagogy	Lectures and Audio Visual classes
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam and One End Semester Exam

**Learning Objectives :**

- To give detailed explanation on Novel Prescribed and visualizing the characters of the Novel and giving views on poets thoughts of the given poems.
- Enable the students inculcate moral values in their life.

**Expected Learning Outcomes :**

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

**CO 1 :** Get the knowledge of Ancient poets and their views of life.

**CO 2 :** Understand the views of Spiritual values.

**CO 3 :** Understand the fantasy in the existing Literature..

**CO 4 :** Understand the official language in Hindi.

**CO5 :** Understand the reality of the social life in the world.



Course	Details
Code	BSC HDL 231
Title	<b>Hindi</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second / Third
Type	Group III Paper III Compulsory Foundation Language
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total :100
Total Modules	04
Pedagogy	Lectures with interactive classes, Role plays from drama, Audio visual classes and Debates
Evaluation Method	Viva-Voce, Assignments, Two Internal Assessment Examination and One End Semester Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To make students understand the moral values given in stories prescribed and practice script and dialogue writing by specimen writing.</li> <li>Enable the students inculcate the moral values in the prescribed Novel.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Gain the knowledge of creating stories. <b>CO 2 :</b> Understand the need of moral values. <b>CO 3 :</b> Follow the required Ethics. <b>CO 4 :</b> Understand the specimen of dialogue writing in Hindi. <b>CO 5 :</b> Gain insights on the emerging trends in literature.	

Course	Details
Code	BSC HDL281
Title	<b>Hindi</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second / Fourth
Type	Group III Paper IV Compulsory Foundation Language
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total :100
Total Modules	04
Pedagogy	Lectures with interactive discussions, Audio Visual Classes, Role plays
Evaluation Method	Viva, Assignments, Internal Exam and Semester Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To explain the Drama prescribed with enactment of characters in the play.</li> <li>Practice to write Translation, as well as learn the official language - Hindi.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Acquire knowledge of reality in present social life. <b>CO 2 :</b> Understand the need of spiritual values. <b>CO 3 :</b> Understand the Fantasy in modern literature. <b>CO 4 :</b> Understand Translations of official language in Hindi. <b>CO 5 :</b> Get acquainted with emerging trends in Hindi Translations.	

Course	Details
Code	BSCSKL 131
Title	<b>Sanskrit</b>
Program	Bachelor of Science (B.Sc.)
Year / Semester	First/First
Type	Group III : Foundation Course – Language 2
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam :80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Role Plays, Quiz, Group Discussions, Debates, Seminars and Presentations
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam

#### **Learning Objectives :**

- To improve the knowledge of Sanskrit Literature and Culture
- of Sanskrit amongst the students and make them succeed in life.
- To motivate students to spread the essence of Devabhasha Sanskrit, by giving them resources required.
- To make the students appreciate the immortal works of our Ancient seers and poets.
- To make the students Learn good Moral values and become good citizens and promote a healthy society.

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

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

**CO 1 :** Understand fundamental concepts, principles and functions of Language.

**CO 2 :** Understand the Literature (both Vedic & classical Literature)

**CO 3 :** Understand the Grammar aspects (kriyapada, vibhakthi, Prayoga et.)

**CO 4 :** Communicate in Sanskrit Language.

**CO 5 :** Understand Ancient Indian sciences like Yoga and Prose etc.

Course	Details
Code	BSCSKL181
Title	<b>Sanskrit</b>
Program	Bachelor of Science (B.Sc.)
Year / Semester	First/ Second
Type	Group III : Foundation Course – Language 2
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam :80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Role Plays, Quiz, Group Discussions, Debates, Seminars and Presentations
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam

#### **Learning Objectives :**

- To improve the knowledge of Sanskrit Literature and Culture of Sanskrit amongst the students and make them succeed in life.
- To motivate students to spread the essence of Devabhasha Sanskrit, by giving them resources required.
- To make the students appreciate the immortal works of our Ancient seers and poets.
- To make the students Learn good Moral values and become good citizens and promote a healthy society.

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

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

**CO 1 :** Understand fundamental concepts, principles and functions of Language.

**CO 2 :** Understand the Literature (both Vedic & classical Literature)

**CO 3 :** Understand the Grammar aspects (Karaka, Samasa, Prayoga et.)

**CO 4 :** Communicate in Sanskrit Language.

**CO 5 :** Understand Ancient Indian sciences like Yoga, Bhagavad Geetha and Poems etc.

Course	Details
Code	BSCSKL231
Title	<b>Sanskrit</b>
Program	Bachelor of Science (B.Sc.)
Year / Semester	Second / Third
Type	Group III : Foundation Course – Language 2
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam :80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Role Plays, Quiz, Group Discussions, Debates, Seminars and Presentations
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To improve the knowledge of Sanskrit Literature and Culture of Sanskrit amongst the students and make them succeed in life.</li> <li>• To motivate students to spread the essence of Devabhasha Sanskrit, by giving them resources required.</li> <li>• To make the students appreciate the immortal works of our Ancient seers and poets.</li> <li>• To make the students Learn good Moral values and become good citizens and promote a healthy society.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand fundamental concepts, principles and functions of Language. <b>CO 2 :</b> Understand the Literature i.e., Plays – Nataka. <b>CO 3 :</b> Understand the Grammar aspects viz., Alankara and Chandamsi. <b>CO 4 :</b> Communicate in Sanskrit language. <b>CO 5 :</b> Understand ancient Indian sciences like Yoga, Bhagavadgeetha, Poems etc.	

Course	Details
Code	BSCSKL281
Title	<b>Sanskrit</b>
Program	Bachelor of Science (B.Sc.)
Year / Semester	Second / Fourth
Type	Group III : Foundation Course – Language 2
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam :80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Role Plays, Quiz, Group Discussions, Debates, Seminars and Presentations
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To improve the knowledge of Sanskrit literature and culture of Sanskrit amongst the students and enable them succeed in life.</li> <li>To motivate students to spread the essence of Devabhasha Sanskrit.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand fundamental concepts, principles and functions of Sanskrit language. <b>CO 2 :</b> Understand the Literature i.e., Vijnanashtastra. <b>CO 3 :</b> Understand the Grammar aspects viz., correct the sentences and letter. <b>CO 4 :</b> Communicate in Sanskrit language. <b>CO 5 :</b> Understand ancient Indian sciences like Yoga, Bhagavadgeetha, and Mahabharatha, Patanjali Yoga, etc.	

Course	Details
Code	BSCPHC131
Title	<b>General Physics I</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First/ First
Type	Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	4
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Use of charts and models.
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objectives :</b> To introduce the concepts of mechanics, Thermodynamics, Low temperature Physics its principles and applications.	
<b>Expected Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the concepts of basic laws of motion in various mechanisms. <b>CO 2 :</b> Determine the moment of inertia of different objects about a given axis. <b>CO 3 :</b> Apply various laws of thermodynamics to various process and real systems. <b>CO 4 :</b> Apply the concept of entropy , calculate heat, work and efficiency of Carnot's engine. <b>CO 5 :</b> Understand the gas laws. <b>CO 6 :</b> Differentiate between real and ideal gas.	

Course	Details
Code	BSCPHCE 133
Title	<b>Physics of Radiation &amp; Environment</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First/ First
Type	Elective Paper
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	02
Examination Duration	02
Max. Marks	CIA :10                      End Semester Exam : 40                      Total : 50
Total Modules	02
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations.
Evaluation Method	Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objectives :</b> To study the concepts of biophysics, geophysics medical physics and environmental studies and to correlate it with daily life.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Revise the basic and general concepts of bio physics <b>CO 2 :</b> Correlate the biological concepts with physics and daily life. <b>CO 3 :</b> Apply the knowledge of physics with medical and biological aspects. <b>CO 4 :</b> Understand theory and working principle of different medical equipments and to know about the physics behind it. <b>CO 5 :</b> To know about different environmental problems and solutions.	



Course	Details
Code	BSCPHC181
Title	<b>General Physics II</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First / Second
Type	Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Use of charts and models.
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective:</b> To introduce the concepts, principles and applications of Properties of matter, relativity, Astrophysics and waves and oscillations.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Revise the fundamental concepts, principles and laws of relativity. <b>CO 2 :</b> Understand the Transformation equations. <b>CO 3 :</b> Know the concepts of modulus of elasticity, viscosity and its applications. <b>CO 4 :</b> Explore the big bang theory and the different stages of stars. <b>CO 5 :</b> Distinguish between free, forced and damped oscillations with example . <b>CO 6 :</b> Enhance the application of Fourier's theorem.	

Course	Details
Code	BSCPHC231
Title	<b>Optics</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second/Third
Type	Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam: 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Use of charts and models.
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective:</b> To introduce the concepts, principles and applications of interference, Polarization and diffraction, electromagnetism, Radiation and Lasers.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Obtain the fundamental knowledge within interferometry, coherence, polarization and diffraction. <b>CO 2 :</b> Get acquainted with Fresnel's and Fraunhofer's diffraction. <b>CO 3 :</b> Understand the concepts of modulus of elasticity, viscosity and its applications. <b>CO 4 :</b> Describe the different types of lasers, its principle, properties of laser beam. <b>CO 5 :</b> Understand Maxwell field equations . <b>CO 6 :</b> Revise the concept of transverse nature of electromagnetic wave.	

Course	Details
Code	BSCPHC281
Title	<b>Electricity and X-ray Crystallography</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second/ Fourth
Type	Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam :80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Use of charts and models.
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective:</b> To introduce the concepts and applications of Transients and DC networks, alternating currents and filters, electrical and magnetic measurements, X-Ray crystallography and Super conductivity.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Obtain the behavior of ohmic and non ohmic devices in DC circuits. <b>CO 2 :</b> Understand the network theorem and its applications. <b>CO 3 :</b> Convert Thevinin's circuit to Norton's circuit and vice-versa. <b>CO 4 :</b> Study the response of LR,CR, LCR circuits. <b>CO 5 :</b> Explain the Applications of filter circuits . <b>CO 6 :</b> Understand the Applications of Ballistic Galvanometer. <b>CO 7 :</b> Knowledge of production and characteristics of X-Rays. <b>CO 8 :</b> Understand the Application of Bragg's spectrometer. <b>CO 9 :</b> Apply the applications of superconductors.	

Course	Details
Code	BSCPHC331
Title	<b>Modern Physics</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third / Fifth
Type	Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam :80                      Total : 100
Total Modules	03
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Use of charts and models.
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective:</b> To introduce the concepts and applications quantum mechanics, atomic spectra, molecular spectra and scattering.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the wave nature of particle, De- Broglie wavelength . <b>CO 2 :</b> Find the difference between optical and electron microscope. <b>CO 3 :</b> Differentiate classical and quantum mechanics. <b>CO 4 :</b> Understand different atomic models. <b>CO 5 :</b> Identify the different regions of molecular rotational, vibration and electronic spectra . <b>CO 6 :</b> Understand the Applications molecular and electronic spectra.	

Course	Details
Code	BSCPHC332
Title	<b>Condensed Matter Physics</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third / Fifth
Type	Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam :80                      Total : 100
Total Modules	03
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Use of charts and models.
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective:</b> To introduce the concepts and applications of Statistical physics, specific heat and free electron theory, Hall effect and band theory of solids, BJT.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Differentiate the classical and quantum statistics . <b>CO 2 :</b> Get the concepts and limitations of Einstein and Debye's theory of specific heat of solids. <b>CO 3 :</b> Differentiate classical and quantum free electron theory. <b>CO 4 :</b> Understand the formations of energy bands in solids. <b>CO 5 :</b> Identify the different regions of Transistor characteristics. <b>CO 6 :</b> Apply the applications of Transistors and FET.	

Course	Details
Code	BSCPHC381
Title	<b>Nuclear Physics</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third / Sixth
Type	Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam :80                      Total : 100
Total Modules	03
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Use of charts and models.
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective:</b> To introduce the concepts and applications nuclear radiation, artificial transmutation, nuclear structure and models, nuclear energy, particle accelerators, detectors, cosmic rays and fundamental particles.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the nuclear decay ,radio carbon dating . <b>CO 2 :</b> Classify the neutron and its properties. <b>CO 3 :</b> Derive the Rutherford alpha scattering formula. <b>CO 4 :</b> Estimate the mass of mesons using uncertainty principle. <b>CO 5 :</b> Explain the advantages of particle accelerators and detectors . <b>CO 6 :</b> Acquire the concepts of fundamental particles.	

Course	Details
Code	BSCPHC382
Title	<b>Electronics</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third /Sixth
Type	Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam :80                      Total : 100
Total Modules	03
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Use of charts and models.
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective:</b> To introduce the concepts and applications of OP-AMP, Regulated Power supply, oscillators, digital electronics and communication electronics.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Apply the applications of opamps in different electronic circuits. <b>CO 2 :</b> Understand the digital circuits and its applications. <b>CO 3 :</b> Differentiate between analog and digital circuits . <b>CO 4 :</b> Obtain the principles of communications and its applications. <b>CO 5 :</b> Find the advantages of different communications in electronic field. <b>CO 6 :</b> Differentiate the construction of LCD and LED.	

Course	Details
Code	BSCPHP132
Title	<b>Physics Practicals-I</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First / First
Type	Core Course
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	03+03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	08 Practicals
Pedagogy	Electrical connections, setting the instruments, taking readings.
Evaluation Method	Viva-Voce, one Internal Assessment Exam, One End Semester Exam
<b>Learning Objective:</b> To understand the basic concepts, properties and applications of surface tension, different modules of solid materials.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the moment of inertia of solid material. <b>CO 2 :</b> Determine the moment of inertia of the fly wheel. <b>CO 3 :</b> Find the different modules of solid materials. <b>CO 4 :</b> Determine the Fermi energy of a copper metal. <b>CO 5 :</b> Determine the surface tension of water. <b>CO 6 :</b> Determine of acceleration due to gravity.	



Course	Details
Code	BSCPHP182
Title	<b>Physics Practicals II</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First / Second
Type	Core Course
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	03+03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam :40                      Total : 50
Total Modules	08 Practicals
Pedagogy	Electrical connections, setting the instruments, taking readings.
Evaluation Method	Viva-Voce, One Internal Assessment Exam, One End Semester Exam
<b>Learning Objective:</b> To understand the basic concepts, properties and applications of basic laws, modules of solid materials and semiconductor materials.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Determine the moment of inertia of solid material. <b>CO 2 :</b> Determine the Young's modulus of given cantilever. <b>CO 3 :</b> Find the of different modules of solid materials <b>CO 4 :</b> Get the of coefficient of viscosity of given liquid. <b>CO 5 :</b> Understand the difference between interfacial tension of water and kerosene. <b>CO 6 :</b> Find the acceleration due to gravity.	

Course	Details
Code	BSCPHP232
Title	<b>Physics Practicals III</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second / Third
Type	Core Course
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	03+03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam :40                      Total : 50
Total Modules	08 Practicals
Pedagogy	Electrical connections, setting the instruments, taking readings.
Evaluation Method	Viva-Voce, one Internal Assessment Exam, One End Semester Exam
<b>Learning Objective:</b> To understand the basic concepts, properties and optical applications of different materials	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Determine the low resistance of the given coil. <b>CO 2 :</b> Study of charging of CR circuit. <b>CO 3 :</b> Determine the wavelength of given LASER. <b>CO 4 :</b> Verify the radiation laws. <b>CO 5 :</b> Understand the phenomenon of diffraction. <b>CO 6 :</b> Understand the phenomenon of interference.	

Course	Details
Code	BSCPHP282
Title	<b>Physics Practicals IV</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second / Fourth
Type	Core Course
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	03+03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam :40                      Total : 50
Total Modules	02
Pedagogy	Electrical connections, setting the instruments, taking readings.
Evaluation Method	Viva-Voce, one Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To understand the basic concepts, properties, electrical and optical applications of different materials	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Verify the law of combination of capacitors. <b>CO 2 :</b> Determine the charge sensitiveness of BG. <b>CO 3 :</b> Determine the horizontal component of earth's magnetic field. <b>CO 4 :</b> Verify the field along the axis of a coil. <b>CO 5 :</b> Understand the optical phenomenon. <b>CO 6 :</b> Verify the Maximum Power Transfer theorem.	

Course	Details
Code	BSCPHP333
Title	<b>Physics Practicals V</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third / Fifth
Type	Core Course
Total Credits	02
Total Contact Hours	64
Contact Hours per Week	04+04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80      Total : 100
Total Modules	08 Practicals
Pedagogy	Electrical connections, setting the instruments, taking readings.
Evaluation Method	Viva-Voce, one Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To understand the characteristics of Transistor, Logic gates and Specific charge of an electron.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Study the Series resonance circuit. <b>CO 2 :</b> Determine the unknown capacitance by Anderson's Bridge. <b>CO 3 :</b> Find the wavelength of light by Biprism. <b>CO 4 :</b> Determine the Planck's constant by using LEDs. <b>CO 5 :</b> Understand the Transistor characteristics. <b>CO 6 :</b> Verify the truth tables of Logic Gates.	

Course	Details
Code	BSCPHP383
Title	<b>Physics Practicals VI</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third / Sixth
Type	Core Course
Total Credits	02
Total Contact Hours	64
Contact Hours per Week	04+04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	08 Practicals
Pedagogy	Electrical connections, setting the instruments, taking readings.
Evaluation Method	Viva-Voce, one Internal Assessment Exam, One End Semester Exam
<b>Learning Objective:</b> To understand the concepts of OP-AMP, Logic gates and Capacitance.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Study the Parallel resonance circuit. <b>CO 2 :</b> Determine the unknown capacitance by using BG. <b>CO 3 :</b> Determine the Frequencies by Wien Bridge Oscillator. <b>CO 4 :</b> Study of OP-AMP. <b>CO 5 :</b> explain the working of the CE amplifier circuit. <b>CO 6 :</b> Verify the truth tables of Logic Gates.	

Course	Details
Code	BSCCHC131
Title	<b>Chemistry Paper- I</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First/First
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of Models, Use of PPT Presentations, Brainstorming, Seminars and Presentations, Use of Charts, Model Making Activity.
Evaluation Method	Assignments, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of periodic properties, method of analysis, states of matter, chemical bonding, nature of bonding & mechanisms of organic reaction	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Identify the variation of physical and chemical properties of elements in periodic table. <b>CO 2 :</b> Minimize the error in practical analysis <b>CO 3 :</b> Study the mechanism of organic reactions. <b>CO 4 :</b> Understand the applications of liquid crystals, liquefaction of gases, and advantages of ammonia as solvent <b>CO 5 :</b> Understand the various types of bonding in inorganic and organic molecules.	

Course	Details
Code	BSCCHC132
Title	<b>Chemistry Practical-I</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First/Second
Type	Group I : Core Course
Total Credits	01
Total Contact Hours	48
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	12
Pedagogy	Lectures with interactive sessions, Use of equipments, Demonstration of the experiments, Brainstorming, Use of Charts.
Evaluation Method	One Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of volumetric analysis	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Study the volumetric analysis of HCl, NaOH, CuSO <sub>4</sub> etc. <b>CO 2 :</b> Prepare standard solution <b>CO 3 :</b> Estimate the amount of substance present in the given solution <b>CO 4 :</b> Find the concentration of unknown solution <b>CO 5 :</b> Describe how colour intensity can be used as an indicator of concentration	

Course	Details
Code	BSCCHC181
Title	<b>Chemistry Paper II</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First/Second
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of Models, Use of PPT Presentations, Brainstorming, Seminars and Presentations, Use of Charts
Evaluation Method	Assignments, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of chemical kinetics, surface chemistry, s & p block elements, industrial preparation of some materials, Reactions involving intermediates, reactions and their mechanism.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the calculations of rate and order of various chemical reactions <b>CO 2 :</b> Find the variation of periodic properties in s & p block elements <b>CO 3 :</b> Explain Preparation of glass, paper & cement. <b>CO 4 :</b> Interpret the generation, stability and mechanisms of reaction intermediates. <b>CO 5 :</b> Write the mechanism of Electrophilic and nucleophilic addition/ elimination reactions	



Course	Details
Code	BSCCHC182
Title	<b>Chemistry Practicals- II</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First/First
Type	Group I : Core Course
Total Credits	01
Total Contact Hours	48
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	12
Pedagogy	Lectures with interactive sessions, Use of equipments, Demonstration of the experiments, Brainstorming, Use of Charts.
Evaluation Method	One Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of systematic qualitative analysis of organic compounds, chromatography	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Predict the given organic compound <b>CO 2 :</b> Determine the melting point/boiling point of the organic compounds <b>CO 3 :</b> Identify the elements and functional group present in the organic compounds <b>CO 4 :</b> Understand the chromatographic techniques. <b>CO 5 :</b> Find out the $R_f$ value and identification of organic compounds.	

Course	Details
Code	BSCCHC183
Title	<b>Computer for Chemist &amp; Laboratory safety Techniques- I</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First/Second
Type	Group II :Elective
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	02
Examination Duration	02 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	02
Pedagogy	Lectures with interactive sessions, Use of Models, Use of PPT Presentations, Brainstorming, Seminars and Presentations, Use of Chart Presentation
Evaluation Method	Assignments, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of computers for Chemists and Laboratory safety techniques used in Lab	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the basic structures of computer , memory, output devices, languages and operating system <b>CO 2 :</b> Plot the physical chemistry graphs in computer. <b>CO 3 :</b> Write and draw the chemical formulae and structure in chem sketch. <b>CO 4 :</b> Identify the basic rules in chemical labs, health hazards and reaction hazards. <b>CO 5 :</b> Follow the response to common emergencies such as fires, explosions, chemical spills etc.	

Course	Details
Code	BSCCHC201
Title	<b>Chemistry Paper III</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second/Third
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of Models, Use of PPT Presentations, Brainstorming, Seminars and Presentations, Use of Chart Presentation, Article Writing,
Evaluation Method	Assignments, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of d & f block elements, thermodynamics, binary mixture, concepts of acids and bases, structure and reactive of phenols, ethers and carbonyl compounds, Food Technology, Corrosion Chemistry	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Identify the variation of periodic properties in d & f block elements <b>CO 2 :</b> Understand laws , spontaneity and its relationship with Gibb's free energy <b>CO 3 :</b> Distinguish the stability of phenolic compound with other functional groups <b>CO 4 :</b> Write the mechanisms of named reaction <b>CO 5 :</b> Recognize the fundamentals of food processing, analysis and packing technology. <b>CO 6:</b> Find out the concepts of corrosion and the types of corrosion.	

Course	Details
Code	BSCCHC202
Title	<b>Chemistry Practical- III</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second/Third
Type	Group I : Core Course
Total Credits	01
Total Contact Hours	48
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	12
Pedagogy	Lectures with interactive sessions, Use of equipments, Demonstration of the experiments, Brainstorming, Use of Charts.
Evaluation Method	One Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of systematic semi micro qualitative analysis of mixtures of two inorganic salts.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Develop the skills to separate radicals . <b>CO 2 :</b> Impart the skills and knowledge in estimation of compounds through preliminary test- nature, colour, solubility, dry test, wet test for acid and basic radicals <b>CO 3 :</b> Find the anions and cations. <b>CO 4 :</b> Separate the cations in different group by solubility tests and analysis <b>CO 5 :</b> Find the ions using flame test.	

Course	Details
Code	BSCCHC251
Title	<b>Chemistry Paper IV</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second/Fourth
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of Models, Use of PPT Presentations, Brainstorming, Seminars and Presentations, Use of Chart Presentation
Evaluation Method	Assignments, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of M-L bonding in transition metal compounds, chemical and phase equilibrium, various properties of solution and solvent, synthetic utility of reagents and its reaction mechanism.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Interpret the nomenclature & bonding in coordination compounds. <b>CO 2 :</b> Understand the concepts of M-L bonding in transition metal compounds. <b>CO 3 :</b> Find out the various type of equilibrium using phase diagram. <b>CO 4 :</b> Realise the synthetic utility of oxidizing & reducing agents in chemical reaction <b>CO 5 :</b> Recognise the variation of properties in solvents and solution.	

Course	Details
Code	BSCCHC252
Title	<b>Chemistry Practical -IV</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second/Fourth
Type	Group I : Core Course
Total Credits	01
Total Contact Hours	48
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	12
Pedagogy	Lectures with interactive sessions, Use of equipments, Demonstration of the experiments, Brainstorming, Use of Charts.
Evaluation Method	One Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of determination of density, viscosity, surface tension, percentage of NaCl present in water-phenol system, molecular weight of a non-volatile solute, Refractometry, effect of acid strength on the hydrolysis of an ester.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Determine the density, viscosity and surface tension of the liquid <b>CO 2:</b> Estimate the percentage of the NaCl present in water-phenol system <b>CO 3 :</b> Calculate the molecular weight of the given solute <b>CO 4 :</b> Find the percentage composition of toluene in the given mixture <b>CO 5 :</b> Drive the rate constant of acid hydrolysis of methyl acetate <b>CO 6 :</b> Study the effect of acid strength on the rate constant <b>CO 7 :</b> Drive the catalytic strengths of HCl and H <sub>2</sub> SO <sub>4</sub>	

Course	Details
Code	BSCCHC283
Title	<b>Chemistry in everyday life</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second/Fourth
Type	Group II : Elective
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	02
Examination Duration	02 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	02
Pedagogy	Lectures with interactive sessions, Use of Models, Use of PPT Presentations, Brainstorming, Seminars and Presentations, Use of Chart Presentation
Evaluation Method	Assignments, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of chemistry for our household requirements and for our future.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Apply the chemical compositions in cleansing agents, domestic items, cosmetics etc. <b>CO 2 :</b> Understand food Processing, additives, preservatives and flavors. <b>CO 3 :</b> Determine the chemicals present the substances used in our daily life. <b>CO 4 :</b> Find the use alternative sources of energy or renewable sources of energy <b>CO 5 :</b> Analyse the preparation and applications of Hydrogen energy <b>CO 6 :</b> Find out the adultrants present in food stuffs, harmful effects and their detection.	

Course	Details
Code	BSCCHC301
Title	<b>Chemistry Paper-V</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/Fifth
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	40
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of Models, Use of PPT Presentations, Brainstorming, Seminars and Presentations, Use of Chart Presentation, Chem rangoli
Evaluation Method	Assignments, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of thermodynamics and kinetic aspects of metal complexes and its properties applications, different types of cells, electrodes, spectroscopy, stereochemistry of organic compounds, photochemistry.	
<b>Expected Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the analysis of metal complexes using different analytical methods <b>CO 2 :</b> Detect the practical applications of electrodes, construction of electrodes <b>CO 3:</b> Find the functional group in organic molecules and position of atom using various spectroscopy technics <b>CO 4 :</b> To study the isomerism of organic compounds <b>CO 5 :</b> Separate the bio organic molecules based classification, structure and synthesis	



Course	Details
Code	BSCCHC302
Title	<b>Chemistry Paper- VI</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/Fifth
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	40
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of Models, Use of PPT Presentations, Brainstorming, Seminars and Presentations, Use of Chart Presentation, Extension Activity (Basic Science Lab)
Evaluation Method	Assignments, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of elementary quantum mechanics, spectra of transition metal complexes, thermoanalytical methods, organometallic chemistry, heterocyclic compounds	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Detect the dual nature of light using different theories <b>CO 2 :</b> Identify the use of spectroscopic technics in transition metal complexes <b>CO 3 :</b> Apply the instrumentation and applications of thermoanalytical methods <b>CO 4 :</b> Understand the structure of components of nucleic acids. <b>CO 5 :</b> Divide the heterocyclic compound, structure preparation and its mechanism	

Course	Details
Code	BSCCHC303
Title	<b>Chemistry Practical-V</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/Fifth
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	04 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of equipments, Demonstration of the experiments, Brainstorming, Use of Charts.
Evaluation Method	One Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of Estimation of barium, copper, nickel, iron, adultration, steam distillation, colorimetry	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Estimate the Ba, Cu, Ni, Fe. <b>CO 2 :</b> Determine the adultrants in food stuffs. <b>CO 3 :</b> Separate o-nitrophenol and p-nitrophenol from a mixture. <b>CO 4 :</b> Find the melting point of the given liquid <b>CO 5 :</b> Verify the Beer-Lambert Law by Job's and Mole ratio method	

Course	Details
Code	BSCCHC351
Title	<b>Chemistry Paper-VII</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/Sixth
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	40
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of Models, Use of PPT Presentations, Brainstorming, Seminars and Presentations, Use of Chart Presentation, Outreach programme
Evaluation Method	Assignments, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of Electrochemistry, polymers, composites structure, preparation and properties of biochemical like alkaloids, terpenes, pesticides, Fungicides and herbicides, petroleum products.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Preparation , properties structure applications of organic and inorganic polymers <b>CO 2 :</b> Understand the classification and structure and preparation of biomolecules and its reaction <b>CO 3 :</b> Separate the various types of titrations using different electrodes. <b>CO 4 :</b> Classify the types and role of composites. <b>CO 5 :</b> Write the mechanism of named reaction in acids and its derivatives <b>CO 6 :</b> Make out the composition and isomerization in petroleum products.	

Course	Details
Code	BSCCHC352
Title	<b>Chemistry Paper -VIII</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/Sixth
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	40
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of Models, Use of PPT Presentations, Brainstorming, Seminars and Presentations, Use of Chart Presentation, Industrial Visit
Evaluation Method	Assignments, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of spectroscopy, drugs and chemotherapeutic agents, biomolecules and their structure and reactivity, organo sulphur compounds	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Determine the functional group in organic molecules and position of atom using various spectroscopy technics <b>CO 2 :</b> Classify the types of electronic transitions. <b>CO 3 :</b> Understand classification , structure and synthesis of bio organic molecules <b>CO 4 :</b> Use and action of various types of drugs in biological system. <b>CO 5 :</b> Identify the method of preparation and reactions of organo sulphur compounds.	

Course	Details
Code	BSCCHC353
Title	<b>Chemistry Practical -VI</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/Sixth
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	04 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of equipments, Demonstration of the experiments, Brainstorming, Use of Charts.
Evaluation Method	Viva-voce, One Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce the concepts of Conductometric method, potentiometric method, colorimetry, preparation of compounds and complexes.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Find the strength of the given acid mixture. <b>CO 2 :</b> Calculate the dissociation constant of weak acid. <b>CO 3 :</b> Determine the equivalent conductance of NaCl. <b>CO 4 :</b> Deduce the ionization constant of weak acid. <b>CO 5 :</b> Calculate Concentration of the ion present in a solution. <b>CO 6 :</b> Prepare the organic compounds and complexes.	

Course	Details
Code	BSCMTC131
Title	<b>Calculus and Analytical Geometry</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First/ First
Type	Group 1: Core subject
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Seminars, Brain storming, student lecturing
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To foster experimental problem oriented and discovery learning of mathematics.</li> <li>• To make learning process student friendly.</li> <li>• To orient students towards relating Mathematics applications.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand Fundamentals of Calculus. <b>CO 2 :</b> Calculate areas and volumes of more general shapes. <b>CO 3 :</b> Extend the basic ideas of calculus to functions of several variables <b>CO 4 :</b> Investigate curves, derivatives and integrals in new coordinate system. <b>CO 5 :</b> Investigate method of representing a function as an infinite sum a powerful tool to study Functions	

Course	Details
Code	BSCMTP 132
Title	<b>Mathematics Practical with FOSS-MAXIMA –Lab1</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First/ First
Type	Group 1: Core subject
Total Credits	01
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	08
Pedagogy	Lectures with interactive sessions, Program writing
Evaluation Method	Record book, One Internal Assessment Practical Exam, One End Semester Practical Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To foster computer programming, oriented to discover learning of mathematics.</li> <li>• To make learning process student friendly.</li> <li>• To orient students towards relating Mathematics applications.</li> </ul>	
<b>Expected Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand to relate mathematics to use softwares and computer programming. <b>CO 2 :</b> Calculate areas and volumes of more general shapes. <b>CO 3 :</b> Extend the basic ideas of calculus to functions of several variables <b>CO 4 :</b> Investigate curves, derivatives and integrals in new coordinate system. <b>CO 5 :</b> Investigate method of representing a function as an infinite sum.	

Course	Details
Code	BSCMTC181
Title	<b>Number Theory and Calculus</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First/ Second
Type	Group 1: Core subject
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Seminars, Brain storming, student lecturing
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> <ul style="list-style-type: none"> <li>• To improve the perspective of students on mathematics as per modern requirement.</li> <li>• To make learning process student friendly.</li> <li>• To orient students towards relating Mathematics applications.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand Fundamentals of Calculus. <b>CO 2 :</b> Expose relationship between integers and divisibility properties. <b>CO 3 :</b> Solve GCD of large numbers in few steps. Diophantine equation in one or more unknowns that is to be solved in the integers. <b>CO 4 :</b> Use Multiple integrals to calculate quantity that vary over two or three dimensions. <b>CO 5 :</b> Inter relate polar coordinates and Cartesian coordinates and consequences for graphing.	



Course	Details
Code	BSCMTP 182
Title	<b>Mathematics Practical with FOSS-MAXIMA –Lab2</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	First/ Second
Type	Group 1: Core subject
Total Credits	01
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	08
Pedagogy	Lectures with interactive sessions, Program writing
Evaluation Method	Record book, One Internal Assessment Practical Exam, One End Semester Practical Exam
<b>Learning Objective :</b> <ul style="list-style-type: none"> <li>To foster computer programming, oriented to discover learning of mathematics.</li> <li>To make learning process student friendly.</li> <li>To orient students towards relating Mathematics applications.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand to relate mathematics to use software's and computer programming. <b>CO 2 :</b> Calculate areas and volumes of more general shapes. <b>CO 3 :</b> Extend the basic ideas of calculus to functions of several variables <b>CO 4 :</b> Investigate curves, derivatives and integrals in new coordinate system. <b>CO 5 :</b> Investigate method of representing a function as an infinite sum a powerful tool to study functions	

Course	Details
Code	BSCMTC231
Title	<b>Sequences, Series and Differential equations</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second/ Third
Type	Group 1: Core subject
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Seminars, Brain storming, student lecturing
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To improve the perspective of the students on Mathematics as per modern requirement.</li> <li>To develop a spirit of inquiry and scientific temper in the student.</li> </ul>	
<b>Expected Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Evaluate, differentiate and integrate polynomials of a class of functions. <b>CO 2 :</b> Investigate curves, derivatives and integrals in new coordinate system. <b>CO 3 :</b> Calculate derivatives easily and use derivatives to approximate complicated functions. <b>CO 4 :</b> Differentiate the six basics of trigonometric functions and the derivatives of sines and cosines. <b>CO 5 :</b> Understand method of representing a function as an infinite sum.	

Course	Details
Code	BSCMTP232
Title	<b>Mathematics Practical with FOSS-MAXIMA –Lab3</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second/ Third
Type	Group 1: Core subject
Total Credits	01
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	08
Pedagogy	Lectures with interactive sessions, Program writing
Evaluation Method	Record book, One Internal Assessment Practical Exam, Viva vise, One End Semester Practical Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To foster computer programming, oriented to discover learning of mathematics.</li> <li>• To make learning process student friendly.</li> <li>• To orient students towards relating Mathematics applications.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Relate mathematics to use software's and computer programming. <b>CO 2 :</b> Calculate areas and volumes of more general shapes. <b>CO 3 :</b> Extend the basic ideas of calculus to functions of several variables <b>CO 4 :</b> Investigate curves, derivatives and integrals in new coordinate system. <b>CO 5 :</b> Investigate method of representing a function as an infinite sum.	

Course	Details
Code	BSCMTOE233
Title	<b>Skill development Techniques in Algebra and Calculus</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second/ Third
Type	Group 2: Core elective
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	02
Examination Duration	02 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	02
Pedagogy	Lectures with interactive sessions, Seminars, Brain storming, student lecturing
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To improve the perspective of the students on Mathematics as per modern requirement.</li> <li>To develop a spirit of inquiry and scientific temper in the student.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Analyse various algebraic structures. <b>CO 2 :</b> Investigate curves, derivatives and integrals in new coordinate system <b>CO 3 :</b> Calculate derivatives easily and use derivatives of complicated functions. <b>CO 4 :</b> Differentiate the six basics of trigonometric functions and the derivatives of sines and cosines. <b>CO 5 :</b> Understand the method of representing a function as an infinite sum.	

Course	Details
Code	BSCMTC281
Title	<b>Algebra and complex analysis</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second/ Fourth
Type	Group 1: Core subject
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Seminars, Brain storming, student lecturing
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> <ul style="list-style-type: none"> <li>To improve the perspective of the students on Mathematics as per modern requirement.</li> <li>To develop a spirit of inquiry and scientific temper in the student.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand fundamentals and Algebraic properties. <b>CO 2 :</b> Classify various algebraic structures. <b>CO 3 :</b> Extend Real numbers to Extended Real number system. <b>CO4 :</b> Solve inequalities in polar, exponential forms, powers and roots of complex numbers. <b>CO 5 :</b> Solve problems of extended complex plane and integration of complex valued functions.	

Course	Details
Code	BSCMTP 282
Title	<b>Mathematics Practical with FOSS-MAXIMA –Lab4</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second/ Fourth sem
Type	Group 1: Core subject
Total Credits	01
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	08
Pedagogy	Lectures with interactive sessions, Program writing and execution.
Evaluation Method	Record book, One Internal Assessment Practical Exam, Viva-Voce, One End Semester Practical Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To foster computer programming, oriented to discover learning of mathematics.</li> <li>• To make learning process student friendly.</li> <li>• To orient students towards relating Mathematics applications.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand to relate mathematics to use software's and computer programming. <b>CO 2 :</b> Calculate areas and volumes of more general shapes. <b>CO 3 :</b> Extend the basic ideas of calculus to functions of several variables <b>CO 4 :</b> Investigate curves, derivatives and integrals in new coordinate system. <b>CO 5 :</b> Understand method of representing a function as an infinite sum .	

Course	Details
Code	BSCMTC331
Title	<b>Algebra and Laplace transforms</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/ Fifth
Type	Group 1: Core subject
Total Credits	02
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Seminars, Brain storming, student lecturing
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> <ul style="list-style-type: none"> <li>To improve the perspective of the students on Mathematics as per modern requirement.</li> <li>To develop a spirit of inquiry and scientific temper in the student.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand mapping of functions onto functions <b>CO 2 :</b> Apply various algebraic structures. <b>CO 3 :</b> Understand groups and algebraic structures. <b>CO 4 :</b> Study various properties of the Laplace transform and can solve initial value problems <b>CO 5 :</b> Apply their knowledge and understanding in defining Vector space and modulus.	

Course	Details
Code	BSCMTC332(a)
Title	<b>Graph theory</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/ Fifth
Type	Group 1: Core subject
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Seminars, Brain storming, student lecturing
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To improve the perspective of the students on Mathematics as per modern requirement.</li> <li>To develop a spirit of inquiry and scientific temper in the student.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand application of Graphs, finite and infinite graphs . <b>CO 2 :</b> Understand Isomorphism, subgraphs, operation on graphs and Hamiltonian Paths and circuits. <b>CO 3 :</b> Connect graphs and vector space . <b>CO 4 :</b> Study cutsets, connectivity and separability. <b>CO 5 :</b> Study matrix representation of graphs.	



Course	Details
Code	BSCMTC333(b)
Title	<b>Discrete Mathematics</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/ Fifth
Type	Group 1: Core subject
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Seminars, Brain storming, student lecturing
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To improve the perspective of the students on Mathematics as per modern requirement.</li> <li>To develop a spirit of inquiry and scientific temper in the student.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Learn Basic terminology, representation of graphs and operation on graphs <b>CO 2 :</b> Study multi graphs, weighted graphs , digraph and paths <b>CO 3 :</b> Understand the concept of trees, prefix codes, spanning tree and cutsets <b>CO 4 :</b> Investigate kruskals algorithm, Prims algorithm, shortest path algorithm <b>CO 5 :</b> Understand discrete numeric functions, recurrence relations and recursive algorithm.	

Course	Details
Code	BSCMTP 334
Title	<b>Mathematics Practical with FOSS-MAXIMA –Lab5</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/ Fifth
Type	Group 1: Core subject
Total Credits	01
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	08
Pedagogy	Lectures with interactive sessions, Program writing and execution.
Evaluation Method	Record book, One Internal Assessment Practical Exam, One End Semester Practical Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To foster computer programming, oriented to discover learning of mathematics.</li> <li>• To make learning process student friendly.</li> <li>• To orient students towards relating Mathematics applications.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand to relate mathematics to use software's and computer programming. <b>CO 2 :</b> Calculate areas and volumes of more general shapes. <b>CO 3 :</b> Extend the basic ideas of calculus to functions of several variables <b>CO 4 :</b> Investigate curves, derivatives and integrals in new coordinate system. <b>CO 5 :</b> Investigate method of representing a function as an infinite sum .	

Course	Details
Code	BSCMTC381
Title	<b>Numerical Analysis</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/ Fifth
Type	Group 1: Core subject
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Seminars, Brain storming, student lecturing
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To improve the perspective of the students on Mathematics as per modern requirement.</li> <li>To develop a spirit of inquiry and scientific temper in the student.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Study constructive methods for problems in numerical form. <b>CO 2 :</b> Use method of false position , Iteration method, Bisection method and Newton Raphson method depending upon needs. <b>CO 3 :</b> Understand the concept of determinants and able to apply Cramers rule, Gauss elimination and Gauss Jordan method. <b>CO 4 :</b> Relate differences of polynomials, Relation between the operators ,finite differences <b>CO 5 :</b> Apply Newtons forward and backward interpolation formula for interpolation.	

Course	Details
Code	BSCMTC382(a)
Title	<b>Linear Algebra</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/ Fifth
Type	Group 1: Core subject
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Seminars, Brain storming, student lecturing
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To improve the perspective of the students on Mathematics as per modern requirement.</li> <li>To develop a spirit of inquiry and scientific temper in the student.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Identify Kernel , Isomorphism, quotient space , vector space , Matrix and linear transformation <b>CO 2 :</b> Use elementary row and column operations, find rank and nullity of a matrix <b>CO 3 :</b> Determine homogeneous and non-homogeneous equations <b>CO 4 :</b> Identify minimal polynomial of a matrix, minimal polynomial of a linear transformation <b>CO 5 :</b> Apply characteristic roots and characteristic vectors and Cayley Hamilton theorem.	

Course	Details
Code	BSCMTC383(b)
Title	<b>Linear Programming</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/ Fifth
Type	Group 1: Core subject
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Seminars, Brain storming, student lecturing
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To improve the perspective of the students on Mathematics as per modern requirement.</li> <li>To develop a spirit of inquiry and scientific temper in the student.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Apply geometric linear programming, Canonical forms for LPP and pivot transformation <b>CO 2 :</b> Understand Simplex algorithm for minimum table, non canonical LPP and duality theorem <b>CO 3 :</b> Understand Matrix games and von newmann minimax theorem. <b>CO 4 :</b> Solve transportation and assignment problem, Hungarian algorithm <b>CO 5 :</b> Analyse the maximal flow network problem and shortest path algorithm.	

Course	Details
Code	BSCMTP385
Title	<b>Mathematics Practical with FOSS-MAXIMA-Lab6</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/Six
Type	Group 1: Core subject
Total Credits	01
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	30 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	08
Pedagogy	Lectures with interactive sessions, Program writing
Evaluation Method	Record book, One Internal Assessment Practical Exam, One End Semester Practical Exam
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To foster computer programming, oriented to discover learning of mathematics.</li> <li>• To make learning process student friendly.</li> <li>• To orient students towards relating Mathematics applications.</li> </ul>	
<b>Expected Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand to relate mathematics to use software's and computer programming. <b>CO 2 :</b> Calculate areas and volumes of more general shapes. <b>CO 3 :</b> Extend the basic ideas of calculus to functions of several variables <b>CO 4 :</b> Investigate curves, derivatives and integrals in new coordinate system. <b>CO 5 :</b> Understand method of representing a function as an infinite sum.	

Course	Details
Code	BSCBOC 131
Title	<b>Microbes and Algae</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	First/ First
Type	Core course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive session, Use of power point presentation, use of over headed projector, Charts, Group discussion, peer teaching learning, study field visit, experimental learning, and project based learning.
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam, Assignments, field visit report.
<b>Learning Objective :</b> To learn about Indian botanist, Salient features, thallus structure, Classification and reproduction in Viruses, Bacteria and Algae.	
<b>Expected Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the branches, scope and contributions of Indian botanists. <b>CO 2 :</b> Know the Classification of Viruses ,Bacteria and algae. <b>CO 3 :</b> Understand the thallus structure of Viruses ,Bacteria and algae. <b>CO 4 :</b> Know the different types reproductions in Viruses ,Bacteria and algae. <b>CO 5 :</b> Understand the economic and industrial uses of Viruses ,Bacteria and algae.	

Course	Details
Code	BSCBOC 181
Title	<b>Fungi, Bryophytes, Histology and Anatomy</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	First/ Second
Type	Core course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive session, Use of power point presentation, use of over headed projector, Charts, Group discussion, peer teaching learning, study field visit, experimental learning, and project based learning.
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam, Assignments, field visit report, Seminar presentation and Report.
<b>Learning Objective :</b> <ul style="list-style-type: none"> <li>To learn about the Salient features, Classification, thallus structure, types of reproduction and economic importance of Fungi, Lichens and bryophytes.</li> <li>To know about the different diseases, causative agents and disease management in Plant pathology.</li> <li>To learn about the types and theories of tissues.</li> <li>To study the anatomy, primary and secondary structure of Dicot and monocot Root, stem, and leaf.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Know about Classification of Fungi, Lichens and Bryophytes. <b>CO 2 :</b> Understand Structure, Reproduction and Economic Importance of fungi, Lichens and Bryophytes. <b>CO 3 :</b> Know about the Causative agents, symptoms, etiology and control measures of some plant diseases. <b>CO 4 :</b> Understand the types of tissues and anatomical features of Root ,stem and leaves.	



Course	Details
Code	BSCBOC 231
Title	<b>Pteridophytes, Gymnosperms and Angiosperm Embryology</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	Second/ Third
Type	Core course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive session, Use of power point presentation, use of over headed projector, Charts, Group discussion, peer teaching learning, study field visit, experimental learning, and project based learning.
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam, Assignments, field visit report, Seminar presentation and Report, Science article submission.
<b>Learning Objective :</b> <ul style="list-style-type: none"> <li>To learn about the general characteristics, classification, structure, life history and economic importance of pteridophytes and Gymnosperms.</li> <li>To study about the paleobotany and Embryology of Angiosperms.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the salient features, classification and structure of pteridophytes and gymnosperms. <b>CO 2 :</b> Understand the methods of reproduction and economic importance of pteridophytes and gymnosperms. <b>CO 3 :</b> Understand the Developmental biology in Angiosperms. <b>CO 4 :</b> Explain the types of Plant fossils.	

Course	Details
Code	BSCBOC 281
Title	<b>Taxonomy and Economic Botany</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	Second/ Fourth
Type	Core course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive session, Use of power point presentation, use of over headed projector, Charts, Group discussion, peer teaching learning, study field visit, experimental learning, and project based learning
Evaluation Method	Assignment, Two Internal Assessment, Exam, One End Semester Exam, Assignments, field visit report, Seminar presentation and Report.
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To learn the system of classifications, Nomenclature and Herbarium techniques of angiosperms.</li> <li>To study the different families of angiosperms with economic importance.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the system of classifications, Nomenclature, Herbaria and herbarium techniques. <b>CO 2 :</b> Gain Knowledge about Rules and Regulations of Botanical Survey of India. <b>CO 3 :</b> Understand the contributions of different subjects in taxonomy. <b>CO 4 :</b> Understand the morphological Description of different families of angiosperms. <b>CO 5 :</b> Know about the Botanical name, family and the economic importance of certain plants.	

Course	Details
Code	BSCBOC 331
Title	<b>Ecology and Environmental Biology</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	Third / fifth
Type	Core course
Total Credits	02
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive session, Use of power point presentation, use of over headed projector, Charts, Group discussion, peer teaching learning, study field visit, experimental learning, and project based learning.
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam, Assignments, field visit report, Seminar presentation and Report, Science article submission
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To learn the ecological factors and adaptations.</li> <li>To study the structure and functions of ecosystem.</li> <li>To learn about the types of vegetations of Karnataka.</li> <li>To study the natural resources and management, Environmental issues, consequences and control methods.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the different components of Climatic factors and plant adaptations. <b>CO 2 :</b> Understand the Components, types and functions of ecosystem. <b>CO 3 :</b> Explain the types of vegetations and Environmental issues. <b>CO 4 :</b> Comprehend the natural resources and their management.	

Course	Details
Code	BSCBOC 332
Title	<b>Plant physiology</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	Third / fifth
Type	Core course
Total Credits	02
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive session, Use of power point presentation, use of over headed projector, Charts, Group discussion, peer teaching learning, study field visit, experimental learning, project based learning.
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam, Assignments, field visit report, Seminar presentation and Report, Science article submission
<b>Learning Objective :</b> To learn the requirement of mineral nutrition for plant growth, plant – water relationship, process of photosynthesis, respiration, plant growth, flowering, movement and dormancy.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Know the concept of absorption of water by plants, Ascent of sap, transpiration. <b>CO 2 :</b> Understand the mechanism of photosynthesis and respiration in plants. <b>CO 3 :</b> Understand the mechanism of mineral salt absorption. <b>CO 4 :</b> Understand mechanism of enzyme action. <b>CO 5 :</b> Figure out practical application of growth regulators in the field of agriculture and horticulture.	

Course	Details
Code	BSCBOC 381
Title	<b>Cytology, Molecular biology and Genetics</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	Third / Sixth
Type	Core course
Total Credits	02
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive session, Use of power point presentation, use of over headed projector, Charts, Group discussion, peer teaching learning, study field visit, experimental learning, project based learning.
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam, field visit report, Seminar presentation and Report, Science article submission
<b>Learning Objective :</b> To learn structure of plant cell, cell organelle and their function, cell division and chromosomes, structure chemistry and expression of gene, genetics, genetic variation and extra nuclear genome.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Know the types of cell organelle, its structure and its function. <b>CO 2 :</b> Understand the mechanism of photosynthesis and respiration in plants. <b>CO 3 :</b> Have knowledge about mendelian principles. <b>CO 4 :</b> Understand mechanism of sex determination in plants <b>CO 5 :</b> Figure out genetic variations and extra nuclear genome.	

Course	Details
Code	BSCBOC 382
Title	<b>Plant propagation and biotechnology</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	Third / Sixth
Type	Core course
Total Credits	02
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	4
Pedagogy	Lectures with interactive session, Use of power point presentation, use of over headed projector, Charts, Group discussion, peer teaching learning, study field visit, experimental learning, project based learning.
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam, field visit report, Seminar presentation and Report, Science article submission
<b>Learning Objective :</b> To learn plant propagation and plant breeding techniques, plant tissue culture, plant biotechnology, environmental biotechnology.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Apprehend methods of plant propagation and plant breeding. <b>CO 2 :</b> Understand the concept of cellular totipotency. <b>CO 3 :</b> Figure out basic aspects of plant tissue culture. <b>CO 4 :</b> Understand steps involved in recombinant DNA technology. <b>CO 5 :</b> Know the use of biotechnology in environmental pollution control, bioremediation and biominning.	

Course	Details
Code	BSCBOC 132
Title	<b>Microbes and Algae - Practicals</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	First/ first
Type	Core course
Total Credits	01
Total Contact Hours	30
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	10
Pedagogy	Use of plant specimen, charts, Use of power point presentation, use of over headed projector, Study field visit, experimental learning, and experiment demonstration.
Evaluation Method	Records, one Preparatory practical Exam, One End Semester Exam, Algal specimen and field note submission
<b>Learning Objective :</b> Microscopic observation and identification of Algae, to study TMV and phytoplasma with the help of electron micrographs, Microscopic observation of bacterial cells by simple staining technique.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the working principle of compound and dissection microscopes. <b>CO 2 :</b> Distinguish the morphology of bacterial cells <b>CO 3 :</b> Mounting and Identification of microscopic algae. <b>CO 4 :</b> Identify macroalgae. <b>CO 5 :</b> Know the Causative agents, symptoms, etiology and control measures of some bacterial and viral diseases of plants	

Course	Details
Code	BSCBOC 182
Title	<b>Fungi, Bryophytes, Histology and Anatomy - Practicals</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	First/ Second
Type	Core course
Total Credits	01
Total Contact Hours	30
Contact Hours per Week	03
Examination Duration	03 hours
Max. Marks	CIA :10                      End Semester Exam : 40                      Total : 50
Total Modules	10
Pedagogy	Use of plant specimen, charts, Use of power point presentation, use of over headed projector, Study field visit, experimental learning, experiment demonstration.
Evaluation Method	Records, one Preparatory practical Exam, One End Semester Exam, fungal specimen and field note submission.
<b>Learning Objective :</b> Microscopic observation and identification of Fungi, observation and study of crop plants infected by fungi included in the syllabus, Microscopic observation and identification of Bryophytes and study of thallus structure, to study the structure and function of plant tissues. Permanent slide preparation of root, stem and leaf of Monocots and dicots.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Mount, identify and study the mycelial structure of fungi <b>CO 2 :</b> Identify different types of macrofungi and lichens. <b>CO 3 :</b> Understand the Causative agents, symptoms, etiology and control measures of some fungal disease of plants <b>CO 4 :</b> Mount, identify and study the thallus structure and reproductive structures of certain Bryophytes. <b>CO 5 :</b> Understand the method of preparation of permanent slides.	



Course	Details
Code	BSCBOC 232
Title	<b>Pteridophytes, Gymnosperms and Angiosperm Morphology - Practicals</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	Second/ Third
Type	Core course
Total Credits	01
Total Contact Hours	30
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	10
Pedagogy	Use of plant specimen, charts, Use of power point presentation, use of over headed projector, Study field visit, experimental learning, and experiment demonstration.
Evaluation Method	Records, one Preparatory practical Exam, One End Semester Exam, plant specimen and field note submission
<b>Learning Objective :</b> To mount, identify and study the sporophyte and reproductive structure of certain Pteridophytes and Gymnosperms, root, stem and leaf modification of Angiosperms, To dissect out and mount and preparation of permanent slides of monocot and dicot embryo.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand mounting techniques, sectioning and identification of vegetative and reproductive parts of certain pteridophytes. <b>CO 2 :</b> Understand mounting techniques, sectioning and identification of vegetative and reproductive parts of certain gymnosperms. <b>CO 3 :</b> Know the function of modifications shown by angiosperms <b>CO 4 :</b> Understand the methods of fossilization and fossil plants. <b>CO 5 :</b> Identify the method of dissection and preparation of permanent slides.	

Course	Details
Code	BSCBOC 282
Title	<b>Taxonomy and Economic Botany - Practicals</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	Second/ Fourth
Type	Core course
Total Credits	01
Total Contact Hours	30
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	10
Pedagogy	Use of plant specimen, charts, Use of power point presentation, use of over headed projector, Study field visit, experimental learning, experiment demonstration.
Evaluation Method	Records, one Preparatory practical Exam, One End Semester Exam, herbarium and field note submission.
<b>Learning Objectives :</b> To dissect out the floral parts of plants coming under the families prescribed in the theory syllabus, identify the economic products related to theory syllabus and write their botanical name, family and uses. To briefly study about herbarium techniques.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Mount, identify and study the floral parts of plants <b>CO 2 :</b> Understand the morphological peculiarities of different families <b>CO 3 :</b> Know herbarium technique – preparation and preservation <b>CO 4 :</b> Have an idea about the identification methods of family of any plant. <b>CO 5 :</b> Understand Botanical name, family and the economic importance of economic products of plants.	

Course	Details
Code	BSCBOC 333
Title	<b>Ecology, Environmental Biology and Plant Physiology</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	Third / fifth
Type	Core course
Total Credits	01
Total Contact Hours	40
Contact Hours per Week	04
Examination Duration	04 hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	20
Pedagogy	Use of plant specimen, charts, Use of power point presentation, use of over headed projector, Study field visit, experimental learning, and experiment demonstration.
Evaluation Method	Records, one Preparatory practical Exam, One End Semester Exam, project report submission.
<b>Learning Objective :</b> <ul style="list-style-type: none"> <li>To learn about determination of pH of different types of soil, estimation of salinity of soil or water samples, study of working principle of different ecological instruments.</li> <li>To study morphological and anatomical adaptation of angiosperms.</li> <li>To determine the solute potential of the cell sap by plasmolytic method.</li> <li>To study the transpiration rate, separation of plant pigments by chromatography method, estimation of protein by colorimetric method, plant movements, imbibition pressure, fermentation, plant growth, oxygen liberation during photosynthesis</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Determine pH of water and soil sample <b>CO 2 :</b> Understand the morphological and anatomical adaptation of angiosperms. <b>CO 3 :</b> Know the structure, function and process of ecosystem. <b>CO 4 :</b> Understand the format of project report writing by undertaking project work. <b>CO 5 :</b> Have knowledge about the instruments used for ecological study.. <b>CO 6 :</b> Understand estimation of protein in a given sample by colorimetric method.	

Course	Details
Code	BSCBOC 383
Title	<b>Cytogenetics, Molecular Biology, Plant Propagation and Biotechnology</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	Third / Sixth
Type	Core course
Total Credits	01
Total Contact Hours	40
Contact Hours per Week	04
Examination Duration	04 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	10
Pedagogy	Use of plant specimen, charts, Use of power point presentation, use of over headed projector, Study field visit, experimental learning, and experiment demonstration.
Evaluation Method	Records, one Preparatory practical Exam, One End Semester Exam.
<b>Learning Objective :</b> <ul style="list-style-type: none"> <li>To learn cell structure under light microscope, measure the length and breadth of cells by micrometry technique, to study different stages of mitosis and meiosis, solve genetic problems.</li> <li>To learn plant propagation methods, techniques of emasculation, artificial pollination and bagging, pollen viability test, equipment's and media used in tissue culture, synthetic seed preparation, electrophoresis, design of waste water treatment plants</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Know the handling of compound microscope. <b>CO 2 :</b> Comprehend the method to measure length and breadth of cells using micrometry technique.. <b>CO 3 :</b> Understand process of mitotic and meiotic division. <b>CO 4 :</b> Understand the method to check the viability of pollen grains <b>CO 5 :</b> Solve genetic problems.	

Course	Details
Code	BSCBOCE 133
Title	<b>Mushroom Cultivation Technology</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	First/ first
Type	Elective course
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	02
Examination Duration	02 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	02
Pedagogy	Lectures with interactive session, Use of power point presentation, use of over headed projector, Charts, Group discussion, peer teaching learning.
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam, Assignments.
<b>Learning Objective :</b> To learn about edible and non-edible mushroom, mushroom cultivation technology, storage bed preparation, chemical composition and their nutritional value	
<b>Expected Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Distinguish between edible and non-edible mushroom. <b>CO 2 :</b> Understand the cultivation technology. <b>CO 3 :</b> Gain knowledge about small scale cultivation of mushroom at home. <b>CO 4 :</b> Understand nutritional values and food preparation. <b>CO 5 :</b> Have an idea about the market value and export value.	

Course	Details
Code	BSCBOCE 283
Title	<b>Plant diversity for human welfare</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	Second/ Fourth
Type	Elective course
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	02
Examination Duration	02 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	02
Pedagogy	Lectures with interactive session, Use of power point presentation, use of over headed projector, Charts, Group discussion, peer teaching learning.
Evaluation Method	Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> To learn concept of biodiversity and types of biodiversity, plant as a source of food and medicine, plants in industry, culture and climate regulation, conservation of plant diversity.	
<b>Expected Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Apprehend the genetic, species and ecosystem diversity of plants. <b>CO 2 :</b> Know about plant based medicinal systems. <b>CO 3 :</b> Explain the history of modern medicine. <b>CO 4 :</b> Understand industrially and commercially important plants and their products. <b>CO 5 :</b> Understand the methods of plant and forest conservation.	

Course	Details
Code	BSCZOC131
Title	<b>Animal diversity I</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	First / First
Type	Group I : Core subject
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Group Discussions, use of OHP, use of models and museum specimens, CD's, field-oriented project.
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective :</b> <ul style="list-style-type: none"> <li>To introduce general characters of the phylum and classification upto classes with distinctive characters of invertebrates.</li> <li>To introduce the principles of Binomial nomenclature and Linnaean hierarchy.</li> <li>To describe the biological hotspots with reference to India.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Represent the outline classification of invertebrates enumerating characteristic features of different phyla. <b>CO 2 :</b> Identify and classify invertebrates scientifically. <b>CO 3 :</b> Differentiate the invertebrates based on their coelom, body symmetry, metamerism, cephalisation and vital organs. <b>CO 4 :</b> Compare the water vascular system of Echinodermata with that of canal system of Porifera. <b>CO 5 :</b> Recognize the diversity from Protozoa to Echinodermata.	

Course	Details
Code	BSCZOC132
Title	<b>Animal diversity I</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	First / First
Type	Group I : Core subject Practical
Total Credits	01
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	11
Pedagogy	Lectures with interactive sessions, Use of PPT and OHP Presentations, Group Discussions, use of models/spotters/specimens, Mounting and dissection of animal system.
Evaluation Method	Continuous evaluation, Assignment, Record book, preparatory practical exam, One End Semester Exam.
<b>Learning Objective :</b> <ul style="list-style-type: none"> <li>To identify, classify and enumerate the external features of the commonly available invertebrate specimens.</li> <li>To demonstrate the dissection of animal system and to prepare the whole mount of Prawn, Leech, Cockroach and Earthworm.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Identify with scientific classification of commonly available invertebrates specimens . <b>CO 2 :</b> Draw the labelled diagrams of the identified specimens. <b>CO 3 :</b> Demonstrate the dissected animal system. <b>CO 4 :</b> Prepare the whole mount of Cnidarian colonies and Crustacean larva. <b>CO 5 :</b> Prepare and observe hay infusion culture to study living protozoans.	



Course	Details
Code	BSCZOC181
Title	<b>Animal diversity –II (Chordata )</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	First /second
Type	Core course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Group Discussions, Use of OHP presentation, use of charts, use of models and museum specimens.
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam.

**Learning Objective :**

- Introduce the classification of phylum chordate up to classes giving the important characters.
- Discuss the evolutionary connecting link, affinities between the different classes of chordate.
- Introduce the endo and exo-skeletal structures in vertebrates.

**Expected Learning Outcomes:**

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

**CO 1:** Represent the outline classification of vertebrates enumerating characteristic features of different sub phyla, division, super class and classes.

**CO 2 :** Compare the morphology of fish, amphibians, reptilians and mammalians.

**CO 3 :** Understand the aerial adaptation in aves, dentition in mammals and aquatic adaptation in fish.

**CO 4 :** Understand the vertebrate evolutionary tree.

**CO 5 :** Identify the endo skeleton and exoskeleton of different chordates.

Course	Details
Code	BSCZOP182
Title	<b>Animal diversity –II (chordata )</b>
Programme	Bachelor of Science [(B.Sc.) (BZC)]
Year / Semester	First /second
Type	Group I : Core subject Practical
Total Credits	01
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	06
Pedagogy	Spotters, Lectures with interactive sessions, Use of PPT and OHP Presentations, Group Discussions, use of charts/model/specimens.
Evaluation Method	Continuous evaluation, Viva-Voce, Record book, Preparatory practical exam, One End Semester Exam
<b>Learning Objective :</b> <ul style="list-style-type: none"> <li>To identify, classify the morphological features of the commonly available vertebral specimens.</li> <li>To demonstrate the dissection of mouse or shark and mounting of fish scales.</li> </ul>	
<b>Expected Learning Outcomes:</b> Upon the completion of this course, the students will be able to: <b>CO 1 :</b> Identify with scientific classification of commonly available chordate specimens. <b>CO 2 :</b> Demonstrate the digestive and reproductive system of mouse and afferent, cranial nerves of shark. <b>CO 3 :</b> Draw the labelled diagrams of the identified specimens. <b>CO 4 :</b> Develop the skill of mounting fish scales – Placoid, Ctenoid and Cycloid. <b>CO 5 :</b> Identify the endoskeleton and exoskeleton structure of vertebrates.	

Course	Details
Code	BSCZOC 231
Title	<b>Physiology, Biochemistry and Immunology</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second / Third
Type	Group I Core Subject
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations/ Charts/ Models, Use of Educative Videos, Group Discussions, Brainstorming, Case Analysis, Experimental methods, Seminars and Presentations, Assignment works.
Evaluation Method	Viva-Voce, Assignment, Seminars and Presentations, Two Internal Assessment Exam, One End Semester Exam.
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To introduce physiological concepts and to study the functions of body systems.</li> <li>To study the core principles of Biochemistry and Immunological processes that governs complex biological system.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Enhance their knowledge and appreciate working mechanism of the body. <b>CO 2 :</b> Understand the important functions of physiological systems. <b>CO 3 :</b> Understand the hormones and its interaction with physiological system. <b>CO 4 :</b> Recognize and identify biological significance of organic compounds. <b>CO 5 :</b> Describe the role of immune system.	

Course	Details
Code	BSCZOP 232
Title	<b>Physiology, Biochemistry and Immunology</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second / Third
Type	Group I Core Subject Practical
Total Credits	01
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	15
Pedagogy	Brainstorming, Group Discussions, Use of PPT Presentations/ Charts/ Models, Experimental methods.
Evaluation Method	Continuous evaluation, Practical work, Record book, One Preparatory Practical Internal Exam, One End Semester Exam.
<b>Learning Objective :</b> To expand practical knowledge on some areas in Physiology of organisms, Biochemistry and Immunology.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Conduct, analyze and report on physiological experiments. <b>CO 2 :</b> Perform, identify and report on experiments in Biochemistry. <b>CO 3 :</b> Identify the major types of cells in blood smear. <b>CO 4 :</b> Identify the organs of immune system using specimens, slides, charts or models. <b>CO 5 :</b> Understand the principle of reactions of physiological and biochemical experiments.	

Course	Details
Code	BSCZOCE 233
Title	<b>Aquarium Fish Keeping</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second / Third
Type	Group II Elective (Nurturing students proficiency/ skill)
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	02
Examination Duration	02 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	02
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations/ Charts/ Models, Use of Educative Videos, Group Discussions, Brainstorming, Case Analysis, Seminars and Presentations, Assignment works.
Evaluation Method	Viva-Voce, Assignment, Seminars and Presentations, Two Internal Assessment Exam, One End Semester Exam.
<b>Learning Objective :</b> To introduce aquarium fish keeping technique and to create knowledge on self-employment opportunity.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand different ornamental fish of commercial importance. <b>CO 2 :</b> Setting up of aquarium tanks. <b>CO 3 :</b> Identify the types of fish feed and nutritional requirements of ornamental fish. <b>CO 4 :</b> Understand Reproductive Biology of Gold fish and Fish seed collection techniques. <b>CO 5 :</b> Identify common aquarium fish diseases.	

Course	Details
Code	BSCZOC 281
Title	<b>Histology, Animal Behavior, Applied Zoology</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second / Fourth
Type	Group I Core Subject
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	11
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Group Discussions, Brainstorming, Case Analysis, Experimental methods, Seminars and Presentations, Assignment works, Field visits.
Evaluation Method	Viva-Voce, Assignment, Seminars and Presentations, Two Internal Assessment Exam, One End Semester Exam.
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To acquire basic knowledge in histology and to understand the properties and functions of various cell types, tissues and organs.</li> <li>• To understand the key concepts in animal behavior.</li> <li>• To impart basic knowledge on animal husbandry and value-added products of animals.</li> <li>• To create awareness on self-employment opportunity.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Describe the general histological features of endocrine glands, salivary gland and tongue. <b>CO 2 :</b> List and describe the factors that influence animal behavior and methods of studying the behaviour. <b>CO 3 :</b> Identify the different breeds of cattle, poultry birds and understand the housing management. <b>CO 4 :</b> Understand realistic and practical applications of managements of different animal husbandry. <b>CO 5 :</b> Manage organic waste through Vermitechnology and Appreciate organic farming.	

Course	Details
Code	BSCZOP 282
Title	<b>Histology, Animal Behavior, Applied Zoology</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second / Fourth
Type	Group I Core Subject Practical
Total Credits	01
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	11
Pedagogy	Brainstorming, Group Discussions, Use of PPT Presentations/ Charts/ Models, Experimental methods.
Evaluation Method	Continuous evaluation, Practical work, Record book, Project work, One Preparatory Practical Internal Exam, One End Semester Exam.
<b>Learning Objectives :</b> To expand practical knowledge on some areas in Histology, Animal Behaviour and Applied Zoology.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Identify the histological features of various endocrine glands by microscopic examination. <b>CO 2 :</b> Prepare permanent slides under histological examination. <b>CO 3 :</b> Understand Animal behaviour in honey bees, birds and fishes. <b>CO 4 :</b> Appreciates the importance of value added products of animals. <b>CO 5 :</b> Perform field oriented projects.	

Course	Details
Code	BSCZOOE 283
Title	<b>Vermitechnology</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Second / Fourth
Type	Group II Elective (Enabling an exposure to some other discipline/ domain)
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	02
Examination Duration	02 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	02
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations/ Charts/ Models, Use of Educative Videos, Group Discussions, Brainstorming, Seminars and Presentations, Assignment works.
Evaluation Method	Viva-Voce, Assignment, Seminars and Presentations, Two Internal Assessment Exam, One End Semester Exam.
<b>Learning Objective :</b> To introduce organic waste management through vermitechnology.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the vermicomposting methods. <b>CO 2 :</b> List several advantages of vermicomposting. <b>CO 3 :</b> Describe the categories of earthworms. <b>CO 4 :</b> Identify and Analyze the functions of earthworm. <b>CO 5 :</b> Manage waste and Appreciate organic farming.	



Course	Details
Code	BSCZOC 331
Title	<b>Cell Biology and Biotechnology</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third / Fifth
Type	Group I Core Subject
Total Credits	02
Total Contact Hours	40
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	06
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Group Discussions, Brainstorming, Experimental methods, Seminars and Presentations, Assignment works.
Evaluation Method	Viva-Voce, Assignment, Seminars and Presentations, Two Internal Assessment Exam, One End Semester Exam.
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To provide an overview of cell structure and function at molecular level.</li> <li>To introduce to basic molecular biological concepts and techniques used in the fields of Genetic engineering and Biotechnology.</li> </ul>	
<b>Expected Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Describe cell organelles, cellular membrane structure and its functions. <b>CO 2 :</b> Demonstrate the process of DNA replication, Transcription and Translation. <b>CO 3 :</b> Understands the concepts of Cancer Biology, its causes and treatment strategies. <b>CO 4 :</b> Understand the key concepts of Genetic engineering and demonstrate basic principles of various techniques involved in Biotechnology.. <b>CO 5 :</b> Appreciate the applications of biotechnology in environmental, industrial and in disease prevention and diagnosis.	

Course	Details
Code	BSCZOP 333
Title	<b>Cell Biology and Biotechnology</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third / Fifth
Type	Group I Core Subject Practical
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	02
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	09
Pedagogy	Brainstorming, Group Discussions, Use of PPT Presentations/ Charts/ Models, Experimental methods.
Evaluation Method	Continuous evaluation, Practical work, Record book, Project work, One Preparatory Practical Internal Exam, One End Semester Exam.
<b>Learning Objective :</b> To expand practical knowledge on some areas in Cell Biology and Biotechnology.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Observe, identify and report different stages of cell division. <b>CO 2 :</b> Prepare temporary slides and study stages of mitosis and meiosis. <b>CO 3 :</b> Demonstrate the extraction of DNA by centrifugation method. <b>CO 4 :</b> Demonstrate the Salivary gland chromosomes of Drosophila. <b>CO 5 :</b> Identify the different forms of DNA and RNA from models	

Course	Details
Code	BSCZOC332
Title	<b>Genetics, Biostatics, Evolution and Paleontology</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/ Fifth
Type	Group I : Core Subject
Total Credits	02
Total Contact Hours	40
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam :80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Group Discussions, Seminars and Presentations , use of OHP, use of models, CD's, field oriented project.
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam.

#### **Learning Objectives :**

- To study laws of inheritance and interaction of genes, multiple alleles, Polygenic inheritance and pleiotrophism.
- To study linkage and gene mapping, sex determination and sex linked inheritance, gene mutation and DNA repair.
- To introduce Human genetics and Biostatistics, evolution and palaeontology.

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

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

**CO 1 :** Understand Mendelian and non-Mendelian inheritance.

**CO 2 :** Solve genetic and biostatistics problems.

**CO 3 :** Define and classify genetic disorder, gene mutations and sex determination.

**CO 4 :** Discuss the linkage groups and gene frequency.

**CO 5 :** Describe the concept and theories of origin of life.

Course	Details
Code	BSCZOC334
Title	<b>Genetics, Biostatistics, Evolution and Paleontology</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Final / V Semester
Type	Group I : Core Subject Practicals
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	02
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam :40                      Total : 50
Total Modules	08
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Group Discussions, Seminars and Presentations, use of OHP, use of models, CD's, field oriented project.
Evaluation Method	Continuous evaluation, Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam
<b>Learning Objective:</b> <ul style="list-style-type: none"> <li>To study the experiments on Drosophila.</li> <li>To display Barr body in Buccal smear.</li> <li>To detect the blood group.</li> <li>To solve genetics and biostatistics problems.</li> <li>To study human karyotype.</li> <li>To study on evolution and palaeontology.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Solve the genetics and biostatistics problems. <b>CO 2 :</b> Mount sex comb, genital plate of Drosophila and identify its mutants. <b>CO 3 :</b> Determine the sex of individual on the basis of Barr Body using stained Buccal mucosal Cells. <b>CO 4 :</b> Perform blood typing and identify different types of blood group and Rh factor. <b>CO 5 :</b> Understand the phylogenetic relationship among organisms.	

Course	Details
Code	BSCZOC381
Title	<b>Reproductive biology and developmental biology</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third/Sixth
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	40
Contact Hours per Week	03
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam :80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Group Discussions, Seminars and Presentations , use of OHP, use of models.
Evaluation Method	Viva-Voce, Assignment, Two Internal Assessment Exam, One End Semester Exam.
<b>Learning Objective:</b> <ul style="list-style-type: none"> <li>• To introduce reproductive and developmental biology.</li> <li>• To understand the structure of reproductive system in mammals.</li> <li>• To understand the laws of cleavage ,structure of blastula ,fate map ,notogenesis in frog and chick.</li> <li>• To understand the structure of placentas in chick and in different mammals.</li> <li>• To understand concepts of twins and multiple births.</li> </ul>	
<b>Expected Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Describe the structure of male and female reproductive system ,identifying their functions. <b>CO 2 :</b> Understand the concept and mechanism of fertilization . <b>CO 3 :</b> Describe the effect of yolk on cleavage and differentiated the types of cleavage. <b>CO 4:</b> Explain the events of gastrulation and organogenesis. <b>CO 5 :</b> Differentiate the animals placenta based to morphological and histological classification.	

Course	Details
Code	BSCZOP383
Title	<b>Reproductive biology and developmental biology</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third \Sixth
Type	Group I : Core Practicals
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	02
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam :40                      Total : 50
Total Modules	06
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Group Discussions, Seminars and Presentations , use of OHP, use of models, sporters, permanent slides.
Evaluation Method	Continuous evaluation, Viva-Voce, preparatory practical exam, submission of temporary mounted slides, One End Semester Exam.
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To study the whole mount preparation.</li> <li>• To study the permanent slides of frog and chick.</li> <li>• To study the histology of placenta.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Prepare the whole mount and identifying the specimens . . <b>CO 2 :</b> Differentiate the morphological and histological structure of placenta. <b>CO 3 :</b> Identify the developmental stages of frog and chick. <b>CO 4 :</b> Compare the embryonic development of chick . <b>CO 5 :</b> Describe the different types of sperm and egg in animals.	

Course	Details
Code	BSCZOC 382
Title	<b>Environmental Biology, Toxicology and Wildlife Biology</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third / Sixth
Type	Group I Core Subject
Total Credits	02
Total Contact Hours	40
Contact Hours per Week	04
Examination Duration	03 Hours
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions, Use of PPT Presentations, Group Discussions, Brainstorming, Case Analysis, Experimental methods, Seminars and Presentations, Assignment works, Field visits.
Evaluation Method	Viva-Voce, Assignment, Seminars and Presentations, Two Internal Assessment Exam, One End Semester Exam.
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To describe the interaction between organisms and environment.</li> <li>• To introduce Environmental pollution with reference to India and Toxicology.</li> <li>• To introduce history and importance of Wildlife Conservation and projects implemented to protect the endangered species.</li> </ul>	
<b>Expected Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand ecological relationship between organisms and their environment. <b>CO 2 :</b> Understand the types of ecosystem, population and community characteristics. <b>CO 3 :</b> Characterize different types of pollutants and specify its effects over ecosystem. <b>CO 4 :</b> Understand toxicology and associated terms. <b>CO 5 :</b> Analyze the reason for endangerment and appreciate the wildlife conservation and management.	

Course	Details
Code	BSCZOP 384
Title	<b>Project work - Environmental Biology, Toxicology and Wildlife Biology</b>
Programme	Bachelor of Science (B.Sc.)
Year / Semester	Third / Sixth
Type	Group I Core Subject Practical
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	02
Examination Duration	03 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	
Pedagogy	Group Discussions, Use of PPT Presentations/ Charts/ Models.
Evaluation Method	Continuous evaluation, Practical work, Project work, Dissertation, One Preparatory Practical Internal Exam, One End Semester Exam
<b>Learning Objective :</b> To introduce field-oriented projects and acquire practical knowledge on the implementation of the concepts studied under Environmental Biology, Toxicology and Wildlife Biology.	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Perform field oriented projects. <b>CO 2 :</b> Apply knowledge and understanding in collecting data regarding projects. <b>CO 3 :</b> Understand the components of research projects. <b>CO 4 :</b> Collect, Record, Interpret and Analyze the obtained data. <b>CO 5 :</b> Prepare dissertation.	



Course	Details
Code	BSCCSC 131
Title	<b>Digital Computer Fundamentals</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	First/First
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions and practicals, Group Discussions, Debates, Seminars and Presentations
Evaluation Method	Viva-Voce, Internal Assessment Exam both theory and practicals, University Semester Exam, Seminars, Group Discussions
<b>Learning Objective :</b> <ul style="list-style-type: none"> <li>• To study the fundamentals of computer and peripherals</li> <li>• To study the numbers systems, Boolean algebra, combinational and sequential circuits</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Know the concept of computer and peripherals. <b>CO 2 :</b> Understand the usage of number system. <b>CO 3 :</b> Understand Boolean algebra in computers. <b>CO 4 :</b> Able to design the combination circuit. <b>CO 5 :</b> Able to design sequential circuit. <b>CO 6 :</b> Acerate power point presentation with variety of animation and transition <b>CO 7 :</b> Manipulate spreadsheet viz. how to use the formula easily, designing the graph, filtering <b>CO 8 :</b> Design database , insert records and querying in various ways.	

Course	Details
Code	BSCCSP 131
Title	<b>Digital Logic and MS Office Lab</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	First/First
Type	Group I : Prcatical-1
Total Credits	01
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	03
Pedagogy	Lectures with interactive sessions and practicals,
Evaluation Method	Viva-Voce, Internal Assessment Exam in practicals, University Semester Exam, Group Discussions
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To learn how to design the various circuits</li> <li>• To learn MS-Office</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Design the combination circuit <b>CO 2:</b> Design sequential circuit. <b>CO 3 :</b> Create power point presentation with variety of animation and transition <b>CO 4 :</b> Manipulate spreadsheet viz. how to use the formula easily, designing the graph, filtering <b>CO 5 :</b> Design database , insert records and querying in various ways.	

Course	Details
Code	BSCCSC 181
Title	<b>Problem Solving using C Language</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	First/Second
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions and practicals, Group Discussions, Debates, Seminars and Presentations, work out problems
Evaluation Method	Viva-Voce, Internal Assessment Exam both theory and practicals, University Semester Exam, seminars, Group Discussions
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To develop skills in solving problems,</li> <li>• To obtain knowledge about the structure of the programming language C and</li> <li>• To develop the program writing and logical thinking skill.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the basic procedure of algorithm and flowchart which are basic concepts programmer need to know. <b>CO 2 :</b> Apply programming knowledge to create solutions to challenging problems, including specifying, designing, implementing and validating solutions for new problems <b>CO 3 :</b> Know about decision making and looping concepts <b>CO 4 :</b> Explain the meaning and advantages of using arrays <b>CO 5 :</b> Design structures and files.	

Course	Details
Code	BSCCSP 182
Title	<b>C Programming Lab</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	First/Second
Type	Group I : Practical-2
Total Credits	01
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03
Max. Marks	CIA :10                      End Semester Exam : 40                      Total : 50
Total Modules	03
Pedagogy	Lectures with interactive sessions and practicals,
Evaluation Method	Viva-Voce, Internal Assessment Exam in practicals, University Semester Exam, Group Discussions
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To learn C Practically</li> <li>• To understand various concepts in the C language.</li> </ul>	
<p>Upon the completion of this course, the students will be able to :</p> <p><b>CO 1 :</b> Understand the basic procedure of algorithm and flowchart which are basic concepts programmer need to know.</p> <p><b>CO 2 :</b> Apply programming knowledge to create solutions to challenging problems, including specifying, designing, implementing and validating solutions for new problems</p> <p><b>CO 3 :</b> Know about decision making and looping concepts</p> <p><b>CO 4 :</b> Explain the meaning and advantages of using arrays</p> <p><b>CO 5 :</b> Design structures and files.</p>	

Course	Details
Code	BSCCSCE 183
Title	<b>E1: Cloud Computing</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	First/Second
Type	Group II : Elective Course
Total Credits	01
Total Contact Hours	24
Contact Hours per Week	02
Examination Duration	02
Max. Marks	CIA :10                      End Semester Exam : 40                      Total : 50
Total Modules	04
Pedagogy	Lectures with interactive sessions and practicals, Group Discussions, Debates, Seminars and Presentations, work out problems
Evaluation Method	Viva-Voce, Internal Assessment Exam both theory and practicals, University Semester Exam, seminars, Group Discussions
<b>Learning Objective :</b> To introduce the concept of cloud computing, its applications and architecture.	
<b>Expected Learning Outcomes :</b> Upon successful completion of the course the student will be able to: <b>CO 1 :</b> Know the concept of cloud computing, <b>CO 2 :</b> Understand the historical development of cloud computing, <b>CO 3 :</b> Explain the advantages and disadvantages of Cloud Computing. <b>CO 4 :</b> Know the areas of Cloud applications and its architecture of using arrays <b>CO 5 :</b> Design structures and files.	

Course	Details
Code	BSCCSC 231
Title	<b>Data Structures</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	Second/Third
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions and practicals, Group Discussions, Seminars and Presentations, work out problems
Evaluation Method	Viva-Voce, Internal Assessment Exam both theory and practicals, University Semester Exam, seminars, Group Discussions
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To understand the basic data structures and algorithms.</li> <li>• To learn basic applications of Data structure</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Solve the problems using data structures such as stacks, queues, trees, linked lists and graphs <b>CO 2 :</b> Write programs for these using C language.. <b>CO 3 :</b> Apply applications of each.	

Course	Details
Code	BSCCSP 232
Title	<b>Data structures Lab</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	Second/Third
Type	Group I : Prcatical-3
Total Credits	01
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03
Max. Marks	CIA :10                      End Semester Exam : 40                      Total : 50
Total Modules	03
Pedagogy	Lectures with interactive sessions and practicals,
Evaluation Method	Viva-Voce, Internal Assessment Exam in practicals, University Semester Exam, Group Discussions
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To learn data structure concepts Practically</li> <li>• To understand various concepts</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Sort using various techniques. <b>CO 2 :</b> Use various searching techniques <b>CO 3 :</b> Use queue, stack ,linked list <b>CO 4 :</b> Apply various data structures <b>CO 5 :</b> Explain various operations on binary tree.	

Course	Details
Code	BSCCSC 281
Title	<b>Operating Systems and LINUX</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	Second/Fourth
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions and practicals, Group Discussions, Seminars and Presentations, work out problems
Evaluation Method	Viva-Voce, Internal Assessment Exam both theory and practicals, University Semester Exam, seminars, Group Discussions
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>To learn the basics of operating systems.</li> <li>To learn the management of resources like processor, memory, device and information by operating system</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the concepts of operating system, <b>CO 2 :</b> Explain the resources of operating system <b>CO 3 :</b> Understand the management of memory, processor and devices and files. <b>CO 4 :</b> Implicit Linux environment, <b>CO 5 :</b> Apply commands and shell programming.	



Course	Details
Code	BSCCSP 282
Title	<b>LINUX Lab</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	Second/Fourth
Type	Group I : Practical-4
Total Credits	01
Total Contact Hours	36
Contact Hours per Week	03
Examination Duration	03
Max. Marks	CIA :10                      End Semester Exam : 40                      Total : 50
Total Modules	03
Pedagogy	Lectures with interactive sessions and practicals,
Evaluation Method	Viva-Voce, Internal Assessment Exam in practicals, University Semester Exam, Group Discussions, Survey
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To learn the basics of operating systems.</li> <li>• To learn the Linux commands</li> <li>• To learn shell scripts</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Write OS program in linux <b>CO 2 :</b> Use various Linux commands	

Course	Details
Code	BSCCSC331
Title	<b>RDBMS and Oracle</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	Third/Fifth
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions and practicals, Group Discussions, Seminars and Presentations, work out problems, Mini projects
Evaluation Method	Viva-Voce, Internal Assessment Exam both theory and practicals, University Semester Exam, Seminars, Group Discussions
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To learn the basics concepts of database systems.</li> <li>• To learn the oracle commands and</li> <li>• To learn PL/SQL programs</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the concepts of database, i <b>CO 2 :</b> Apply various models, relational model, relational algebra and design theory of relational database. <b>CO 3 :</b> Create tables, joining the tables, writing SQL queries and <b>CO 4 :</b> Write PL/SQL programs. <b>CO 5 :</b> Apply various constraints	

Course	Details
Code	BSCCSC 333
Title	<b>E2: Web Development Using PHP</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	Third/Fifth
Type	Group I : Core Course(Elective)
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03
Max. Marks	CIA :20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions and practicals, Group Discussions, Seminars and Presentations, work out problems, Mini projects
Evaluation Method	Viva-Voce, Internal Assessment Exam both theory and practicals, University Semester Exam, seminars, Group Discussions
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To understand the usage of PHP and MySQL in web development.</li> <li>• To familiarize PHP language data types, logic controls, built-in and user-defined functions.</li> <li>• To develop database application using PHP</li> <li>• To build a simple, yet functional web application using PHP/MySQL</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Design and publish static and dynamic web pages <b>CO 2 :</b> Develop database application using PHP <b>CO 3 :</b> Build a simple, yet functional web application using PHP/MySQL <b>CO 4 :</b> Use for any project	

Course	Details
Code	BSCCSP 334
Title	<b>E1: Oracle and 8086 Programming Lab OR BSCCSP 335:E2: Oracle and Web design Lab Lab</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	Third/Fifth
Type	Group I : Prcatical-5
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	03
Pedagogy	Lectures with interactive sessions and practicals,
Evaluation Method	Viva-Voce, Internal Assessment Exam in practicals, University Semester Exam, Group Discussions,survey
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To learn DBMS cmmands with various syntax.</li> <li>• To learn the constraints</li> <li>• To learn PHP</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Use any SQL commands <b>CO 2:</b> Trigger programs <b>CO 3:</b> Use Packages <b>CO 4:</b> Use HTML tags <b>CO 5 :</b> Do PHP project	

Course	Details
Code	BSCCSC381
Title	<b>Object Oriented Programming with JAVA</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	Third/Sixth
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	04
Pedagogy	Lectures with interactive sessions and practicals, Group Discussions, Seminars and Presentations, work out problems, Mini projects
Evaluation Method	Viva-Voce, Internal Assessment Exam both theory and practicals, University Semester Exam, Seminars, Group Discussions
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To learn the concepts of Object Oriented Programming</li> <li>• To learn the Object Oriented programming using Java.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> Understand the concepts of OOP <b>CO 2 :</b> Explain Java fundamentals. <b>CO 3 :</b> Write the Java programs using the concepts of inheritance, interfaces, <b>CO 4 :</b> Create packages, <b>CO 5 :</b> Explain multithreading and applets.	

Course	Details
Code	BSCCSC 382
Title	<b>E1: Visual Basic.Net Programming</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	Third/Sixth
Type	Group I : Core Course
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total :100
Total Modules	04
Pedagogy	Lectures with interactive sessions and practicals, Group Discussions, Seminars and Presentations, work out problems, Mini projects
Evaluation Method	Viva-Voce, Internal Assessment Exam both theory and practicals, University Semester Exam, Seminars, Group Discussions
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• To learn programming with graphical interface using object-oriented concept</li> <li>• To design forms.</li> <li>• Link with database</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : <b>CO 1 :</b> To develop skill in VB.NET framework, <b>CO 2 :</b> Know the use of tools, <b>CO 3 :</b> Do Programming and connectivity with databases. <b>CO 4 :</b> Write console app.	

Course	Details
Code	BSCCSP 384
Title	<b>E1: Java Programming and Visual Basic Lab</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	Third/Sixth
Type	Group I : Pratical-VI
Total Credits	02
Total Contact Hours	48
Contact Hours per Week	04
Examination Duration	03
Max. Marks	CIA : 20                      End Semester Exam : 80                      Total : 100
Total Modules	03
Pedagogy	Lectures with interactive sessions and practicals,
Evaluation Method	Viva-Voce, Internal Assessment Exam in Practicals, University Semester Exam, Group Discussions, Survey
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• Learning Java concepts Practically</li> <li>• VB.Net concepts practically</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course, the students will be able to : CO 1 : class and objects CO 2: Inheritance CO 3: Applets, Threads CO 4: Designing forms CO5: Data base connectivity with baby.	

Course	Details
Code	BSCCIF131
Title	<b>Constitution of India.</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	First / First
Type	Group III –Elective Foundation Course
Total Credits	01
Total Contact Hours	28 Hours
Contact Hour per Week	02 Hours
Examination Duration	02 Hours
Max. Marks	CIA : 10      End Semester Exam : 40      Total : 50
Total Modules	06
Pedagogy	Debate, Group Discussions, viva-voce, Project Works
Evaluation Method	2 Internal Examinations/ viva-voce/Assignment, One end semester examination
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>Acquire a complete and detailed understanding on Constitution of India.</li> <li>Elicit the knowledge on Constitutional issues.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course the students will be able to : <b>CO 1 :</b> Understand the structure and principles of the constitution. <b>CO 2 :</b> Generate awareness on Fundamental Rights and Fundamental Duties . <b>CO 3 :</b> Enrich the Knowledge on Constitutional functionaries of the state. <b>CO 4 :</b> Understand the Organization and structure of Central/State government . <b>CO 5 :</b> Develop insight on the Role of Judiciary in India.	



Course	Details
Code	BSCHRF181
Title	<b>Human Rights</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	First/ Second
Type	Group III – Elective Foundation Course
Total Credits	01
Total Contact Hours	28 Hours
Contact Hour per Week	02 Hours
Examination Duration	02 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	05
Pedagogy	Lectures with Interactive Sessions, Debate, Group Discussions, PPT
Evaluation Method	2 Internal Examinations / Assignment/ Viva-voce, one end semester examination

**Learning Objectives :**

- Acquire awareness on Human Rights Issues and Concerns.
- Enhance citizenship sensitivity and Initiatives.

**Expected Learning Outcomes :**

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

**CO 1 :** Enrich their knowledge on Human Rights and Human Values.

**CO 2 :** Understand the concept of Human Rights.

**CO 3 :** Promote and protect Human Rights in India.

**CO 4 :** Focus on issues and concerns in Human Rights.

**CO 5 :** Equip themselves with international concerns on Human Rights.

Course	Details
Code	BSCGEF231
Title	<b>Gender Equity.</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	Second /Third
Type	Group III – Elective Foundation Course
Total Credits	01
Total Contact Hours	28 Hours
Contact Hour per Week	02 Hours
Examination Duration	02 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	04
Pedagogy	Lectures with interactive sessions, Debate, Group Discussions, Viva-voce, Assignment, PPT.
Evaluation Method	2 Internal Assessment Examinations and VIVA-VOCE/ Assignment, one end semester examination.
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• Understand the Basic concepts of Gender Equity.</li> <li>• Generate awareness on Gender Discrimination and Violence.</li> <li>• Contribution towards women Empowerment.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course the students will be able to <b>CO 1 :</b> Enrich their knowledge on basic Concept of Gender Equity. <b>CO 2 :</b> Generate awareness on Gender Discrimination and Gender violence. <b>CO 3 :</b> Acquire knowledge on Constitutional Rights and protective Legislations for women. <b>CO 4 :</b> Gain knowledge on Measures adopted / Implemented for Gender Empowerment.	

Course	Details
Code	BSCSF281
Title	<b>Environmental Studies</b>
Programme	Bachelor of Science (B.Sc.)
Year/Semester	Second /Fourth
Type	Group III – Elective Foundation Course
Total Credits	01
Total Contact Hours	28 Hours
Contact Hour per Week	02 Hours
Examination Duration	02 Hours
Max. Marks	CIA : 10                      End Semester Exam : 40                      Total : 50
Total Modules	04
Pedagogy	Lectures with Interactive sessions, Debate, Group Discussions, PPT
Evaluation Method	2 Internal Examinations / viva-voce/ Assignment, one end semester examination.
<b>Learning Objectives :</b> <ul style="list-style-type: none"> <li>• Understand the Environmental studies.</li> <li>• Gain awareness on Environmental pollution.</li> <li>• Apply their knowledge in conservation and management of Natural Resources.</li> </ul>	
<b>Expected Learning Outcomes :</b> Upon the completion of this course the students will be able to <b>CO 1 :</b> Enrich their knowledge on Environment. <b>CO 2 :</b> Generate Awareness on Environment pollutions. <b>CO 3 :</b> Provide knowledge on Resource conservation. <b>CO 4 :</b> Provide knowledge on legislative measures for Environment pollution.	