

The Undergraduate Course of SBMS College requires three years of full time study consisting of six semesters. The institution offers 7 Undergraduate level courses in the Arts Stream- Assamese, Education, English, Economics, History, Philosophy and Political Science, 5 in the Science Stream-Botany, Chemistry, Maths, Physics and Zoology, 1 Self-financed Undergraduate Course in Computer Application (B.C.A) and another Post Graduate Diploma in Computer Application. Apart from these two streams, the institution provides B.Voc programmes in two trades: Animation and Graphic Designing, and Fashion Technology. Keeping in mind the development of the skills, the academic mobility, progression to higher studies and improved potential for employability, the college has devised strategically certain combination of subjects under the newly introduced Semester System as indicated below:

**Combination for the Arts Stream(Major)**

Sl.No	Major	One subsidiary subject to be chosen from
1	Assamese	Philosophy/History/Economics/ Education
2	English	Philosophy/History/Computer Application
3	Economics	Education/Computer Application/ Political Science
4	Education	Philosophy/ Political Science
5	History	Political Science/ Elective Assamese
6	Philosophy	Education/ Elective Assamese
7	Political Science	History/ Economics/ Computer Application

In the case of the students who choose Assamese or English Major, they will have to choose two subsidiary subjects from the above table.

**Combination for the Science Stream(Major)**

Sl.No	Major	One subsidiary subject to be chosen from
1	Botany	Chemistry/Zoology/Computer Application
2	Chemistry	Physics/ Mathematics/ Botany/ Zoology/ Computer Application
3	Physics	Chemistry/ Mathematics/ Computer Application

4	Mathematics	Physics/ Chemistry/ Computer Application
5	Zoology	Botany/ Chemistry/ Computer Application

In the TDC Science, students must take Functional English as compulsory subject. As per GU Regulation, in the 3<sup>rd</sup>& 4<sup>th</sup> Semesters of TDC Second Year Course, all the students of Arts & Science Stream have to study Environmental Studies as a compulsory subject.

#### **Combination of Subjects for General Course( Arts):**

Sl.No	Combination	Subjects
1	A	Education & History
2	B	Education & Elective Assamese
3	C	Education & Philosophy
4	D	History & Elective Assamese
5	E	Political Science & Philosophy
6	F	Political Science & Economics
7	G	Political Science & Computer Application
8	H	Economics & Philosophy
9	I	Economics & Computer Application

#### **Combination of Subjects for General Course( Science):**

Sl.No	Combination	Subjects
1	A	Botany & Chemistry
2	B	Botany & Zoology
3	C	Zoology & Chemistry
4	D	Mathematics & Chemistry
5	E	Mathematics & Physics
6	F	Mathematics & Computer Application
7	G	Botany & Computer Application
8	H	Zoology & Computer Application
9	I	Physics & Chemistry

10	J	Physics & Computer Application
11	K	Chemistry & Computer Application

The college has introduced a self- financed course in Bachelor of Computer Application (BCA) and Post Graduate Diploma in Computer Application ( PGDCA) as full time course under Gauhati University.

Sl.No	Course	Eligibility	Duration	Intake	Further Opportunity for Study
1	BCA	H.S.	3 years	20	MCA, MSc-IT, MSc( Computer Science), MBA
2	PGDCA	Graduate	1 year	35	MCA

## PROGRAMME OUTCOMES AND COURSE OUTCOMES

### B.A ENGLISH

#### PROGRAMME OUTCOMES:

##### Outcomes:

- Students should be familiar with representative literary and cultural texts within a significant number of historical, geographical, and cultural contexts.
- Students should be able to apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres.
- Students should be able to identify, analyze, interpret and describe the critical ideas, values, and themes that appear in literary and cultural texts and understand the way these ideas, values, and themes inform and impact culture and society, both now and in the past.
- Students should be able to write analytically in a variety of formats, including essays, research papers, reflective writing, and critical reviews of secondary sources.
- Students should be able to ethically gather, understand, evaluate and synthesize information from a variety of written and electronic sources.
- Students should be able to understand the process of communicating and interpreting human experiences through literary representation using historical contexts and disciplinary methodologies.

Course Outcome:

Semester I

ENCR1- Methodology of Humanities and Literature

- To know and appreciate the location of literature within humanities
- To establish connections across frontiers of disciplines
- To critically engage with culture, gender and marginality
- To become acquainted with narration and representation.

Semester II

ENCR2- Introduction to Language and Literature

- Appreciate, interpret and critically evaluate literature.
- Form an idea about the various stages in the development of English language.
- Distinguish between the different varieties of English used all over the world.

Semester III

ENCR3- Literature and Informatics

- The students should have a thorough general awareness of computer hardware and software and have good practical skill in performing common basic tasks with the computers.
- The students are expected to create PowerPoint presentations on any topic in literature incorporating extensively researched web sources.

Semester IV

ENCR4- Reading Prose

- To develop critical thinking in students
- To enable them to write and appreciate different types of prose

Semester V

ENCR5- Reading Poetry

- To introduce the students to the basic elements of poetry- to enrich the students through various perspectives readings in poetry

#### ENCR6- Reading Fiction

- To develop critical thinking and imagination through long and short fiction and to familiarize students with cultural diversity through different representative samples of fiction.

#### ENCR7- Reading Drama

- On completion of the course, the students should be familiar with the plays of master-dramatists and will have developed the ability to appreciate and evaluate various types of plays.

#### ENCR8- Language and Linguistics

- To lead to a greater understanding of the human communicative action through an objective study of language.
- To familiarize students with the key concepts of linguistics and develop awareness of the latest trends in language study.
- To help students move towards better and intelligible pronunciation and to improve the general standard of pronunciation in everyday conversation.

#### ENCR 9- Literary Criticism: Theory and Practice

- Become able to differentiate between judgment and appreciation.
- To get in touch with various movements and schools of thought
- To equip them to attempt practical criticism of plays, passages and poems

#### Semester VI

#### ENCR 10- Post Colonial Literatures

- The students will be familiar with literary productions that address issues related to cultural identity in colonized societies, the development of a national identity after colonial domination, and the ways in which writers articulate and celebrate such identity.

- The students will have been acquainted with the resistance of the colonized against the colonizer through literature that articulates it.

#### ENCR11- Women's Literature

- The students will have an awareness of class, race and gender as social constructs and about how they influence women's lives. The students will have acquired the skill to understand feminism as a social movement and a critical tool.
- They will be able to explore the plurality of female experiences.
- They will be equipped with analytical, critical and creative skills to interrogate the biases in the construction of gender and patriarchal norms.

#### ENCR12- Indian Writing in English

- To provide an overview of the various phases of the evolution of Indian writing in English.
- To introduce students to the thematic concerns, genres and trends of Indian writing in English.

#### ENCR13- Comparative Literature

- To inculcate in the pupil a feel of various methods employed to identify shared features of various literatures and to equip him/her to make comparative and contrastive analysis of literary texts.

#### ENCR14- American Literature

- To acquire knowledge about American literature, its cultural themes, literary periods and key artistic features.
- To understand the various aspects of American society through a critical examination of the literary texts representing different periods and cultures.

### **B. A. ECONOMICS**

## Course outcome

### Semester I

#### Methodology of Social Sciences with special Reference to Economics (EM01BA901)

- The course intends to familiarize the students with the broad contours of Social Sciences, specifically Economics and its methodologies, tools and analysis procedures.
- The course also aims to create an enthusiasm among students about different schools of Economic thought and various aspects of social science research, methodology, concepts, tools and various issues.
- To familiarize the students, Science-Different branches of science;
- To familiarize the students Evolution of a scientific approach Social science;
- To disseminate the students Need for interdisciplinary approach;
- To publicize the students Objectivity and subjectivity in social Science;
- To familiarize the students Limits to objectivity in social science;

### Semester II

#### Core 2: Development and Environmental Economics (EMO2BA901)

- To enable the students to understand the theories and strategies of growth and development.
- To impart knowledge about the issues relating to sustainable development, Environment protection and pollution control measures.

### Semester III

#### Core 3: Principles of Micro Economics (EM03BA901)

- This Course is designed to provide basic understanding of micro economic concepts, behaviour of economic agent-consumer, producer, and factor owner –price fluctuations in the market.
- The module includes in this course deal with the concepts of consumer behaviour, production, market, factor pricing and welfare Economics.

## Semester IV

### Core 4: Modern banking (EMO3BA902)

- Banking has a long history in the world. It has undergone profound changes in recent years especially after the far-reaching banking sector reforms in India and elsewhere.
- The present course is designed to acquaint the students with the working of banks and to familiarize them with the basic principles and concepts which are often used in banking literature.

## Semester V

### Core 5: Micro Economic Analysis (EM04CR001)

To familiarize with

- Theory of costs – traditional theory of costs – short run and long run – real cost – money cost, explicit and implicit cost- sunk cost – total cost – average cost – marginal cost – reasons for the U shape of the average cost curve – short run and long run cost curves – envelope curve – modern theory of cost- short run and long run curves – ‘L’ shaped and ‘saucer’ shaped curves.

### Core 6: Public Economics (EM04BA902)

- The Purpose of this course is to give an perspective about the role of state in
- Fostering the economic activities via budget and fiscal policies.
- This course enables the students to understand the various issues between central and State Government.

### Core 7: Quantitative techniques for Economic Analysis (EM05CROO2)

- The objective of this course is to equip the students with primary statistical and mathematical tools for analyzing economic problems.

### Core 8: Principles of Macro Economics (EM05CR001)

- This course is designed to make the students aware of the theoretical aspects of Macro Economics.

### Core 9: Indian Economy (EM05BA903)



- The objectives of the course are to equip the students with the theoretical,
- Empirical and policy issues relating to the society, policy and economy of India.
- The course, in particular, has been prepared in the background of the globalization process and its diverse ramifications on the knowledge economy.

#### Core 10: Economics of Financial Markets (EM05BA904)

- Financial institutions and markets play a significant role in all the modern economies of the world.
- The study of this area is significant especially after the financial sector reforms in most of the countries.
- The present course is designed to acquaint the students with the changing role of the financial sector of the economy.
- The stakeholders are to familiarize with the concepts, the financial institutions and markets.

#### Semester VI

#### Core 12: Macro Economic analysis (EM06CR002)

- This course equips the students to understand systems facts and the latest theoretical developments in Macro Economics.

#### Core 13: Development Issues of the Indian economy (EM06BA907)

- The objectives of the course are to equip the students with the theoretical, empirical and policy issues relating to the society, polity and economy of India.
- The course in particular, has been prepared on the background of the globalization process and its diverse ramifications on the knowledge economy.

#### Core 15: International Economics (EM06BA904)

- The objectives of this course are to arrive at an understanding of theories of international trade and to examine the impact of the trade policies on the dynamic gains.

#### **B.A Assamese :**

**Programme Outcome:** Under Graduate course in Assamese Major deals with linguistics and the history of Assamese literature. It incorporates Assamese literature from the 9th to the 21st century and also includes Western and Eastern Literature and Cultural History. The cultural history paper includes various aspects like tourism, archaeology, agriculture and fashion. This paper requires the students to acquire knowledge on indigenous dress and ornaments. It also encompasses information on various religious and historical places of interest and archaeology. Variety and scope of agriculture is another area that it covers.

**Programme Specific Outcome:** After completion of this course students will gain information on the Assamese culture and tradition. The course will provide skills in creative writing. Competence in the language will empower them with communicative skills.

**Course Outcome:** After passing out with Major in Assamese students can opt for Post Graduate in literature, Linguistics, Culture Studies, Mass Communication and Tourism. Students can also opt for Fashion Designing and Beautician courses. They can engage themselves as teachers and also as entrepreneurs in agriculture.

#### **B.A History :**

**Programme Outcome:** The Under Graduate course in History Major comprises of Ancient, Medieval and Modern Indian history, which can be further categorized into History of Science and Technology, Historiography, Sultanate period, Mughal period, India under the East India Company, Indian Freedom Movement. The course also includes History of Great Britain, European History(different periods) and International Relations. The syllabus incorporates the history of eastern countries like China and Japan. To give the students an insight into the regional history the course includes the history of Assam of different periods.

**Programme Specific Outcome:** The course in essence tries to teach students to link the past with the present. E.H.Carr defined History as “an unending dialogue between the past and the present”. Keeping this in mind the course deals with past events as a continuous, systematic narrative of the past events as relating to a particular people, country, period, persons, etc., written as a chronological account and relating to the present.

**Course Outcome:** This course prepares students for higher studies in History, Archaeology, Culture Studies, Mass Communication etc; for competitive examination in Civil Services.

#### **B.A Education:**

**Programme Outcome:** The Under Graduate programme in Education Major helps the students to understand the meaning, aims, function and role of Education. The course explains the Indian and Western schools of Philosophy and their impact on Education. It discusses the contribution of great educators. The course also involves understanding the meaning and different perspectives of psychology and different theories of intelligence. The recommendations of the different Education Commissions are also included in the course.

**Programme Specific Outcome:** Micro- teaching, preparing lesson- plans, practice teaching in schools which are integral parts of the syllabus will train the students in teaching skills. Students will also gain a reasonable knowledge in psychology.

**Course Outcome:** The course prepares students for higher studies in Education and Psychology. It equips students for various avenues like research, teaching, competitive examinations, jobs in DIET, etc.

#### **B.A Political Science :**

**Programme Outcome:** Political Science Major course has a significant thrust on Indian Constitution, Indian Politics and Government, Public Administration and International Relations. It also requires students to study the constitutions of China, Switzerland, United Kingdoms and America. The course includes Sociology, Women and Politics, Western and Indian Political Thinkers and Human Rights.

**Programme Specific Outcome:** The course familiarizes the students with different approaches to the study of politics and orients them on contemporary political problems and behaviour thus enabling them to formulate a general idea on political phenomena. It also helps them to comprehend the basic structure and processes of government systems.

**Course Outcome:** The course prepares students for pursuing higher education in Political Science. It orients students towards national and state level competitive examinations like APSC, UPSC, etc. Many students also pursue courses in Law.

#### **B.A Philosophy :**

**Programme Outcome:** The three year Under Graduate course in Philosophy (Major) initiates students to Greek Philosophy, Indian and Western Philosophy and Ethics, Philosophy of Religion- theory, origin and development, Epistemology and Metaphysics, Social and Political Philosophy and Logic.

**Course Outcome:** The course develops introspective thinking and analytical abilities of the students. At the end of the course students opt for higher studies in Philosophy

## **B. Sc. Mathematics:**

### PROGRAM SPECIFIC OUTCOMES

After the successful completion of this course, the student will:

- Be able to explain the core ideas and the techniques of mathematics at the college level.
- Be able to recognize the power of abstraction and generalization, and to carry out investigative mathematical work with independent judgment.
- Be able to setup mathematical models of real world problems and obtain solutions instructed and analytical approaches with independent judgment.
- Be able to carry out objective analysis and prediction of quantitative information with independent judgment.
- Be able to communicate effectively about mathematics to both lay and expert audiences utilizing appropriate information and communication technology.
- Be able to work independently, and to collaborate effectively in team work and team building.
- Be able to conduct self-evaluation, and continuously enrich themselves through lifelong learning.
- Be able to communicate to lay audiences and arouse their interest in the beauty and precision of mathematical arguments and science.
- Be able to recognize the importance of compliance with the ethics of science and being a responsible citizen towards their community and a sustainable environment.
- Be able to cultivate a mathematical attitude and nurture the interests.

Course Outcomes:

First Semester: MM1B01: Foundation of Mathematics

On completion of this course, successful students will be able to:

- Prove statements about sets and functions; analyze statements using truth tables;
- Construct simple proofs.
- Familiarize mathematical Symbols and standard methods of proofs.

Second Semester: MM2B01: Analytic Geometry, Trigonometry and Matrices

On completion of this course, successful students will be able to:

- find the equation to tangent, normal at a point on a conic;
- find the polar equation of a line, circle, tangent and normal to conics
- familiarize real and imaginary parts of a circular and hyperbolic functions of a complex variable
- solve a System of Linear equations using the inverse of a matrix
- familiarize characteristic roots and characteristic vectors.
- to find the inverse of a matrix by Cayley-Hamilton theorem

Third Semester: MM3B01: Calculus

After completing this course the learner should be able to

- Find the higher order derivative of the product of two functions.
- Expand a function using Taylor's and Maclaurin's series.
- Conceive the concept of asymptotes and obtain their equations.
- Learn about partial derivatives and its applications.
- Find the area under a given curve, length of an arc of a curve when the equations are given in parametric and polar form.
- Find the area and volume by applying the techniques of double and triple integrals

Fourth Semester: MM4B01: Vector Calculus, Theory of Equations And Numerical methods

After completing this course the learner should be able to

- Represent vectors analytically and geometrically, and compute dot and cross products for presentations of lines and planes,
- Analyze vector functions to find derivatives, tangent lines, integrals, arc length, and curvature,
- Compute limits and derivatives of functions of 2 and 3 variables,

- Apply derivative concepts to find tangent lines to level curves and to solve optimization problems,
- Evaluate double and triple integrals for area and volume,
- Differentiate vector fields
- Determine gradient vector fields and find potential functions
- Analyze the fundamental theorem of calculus and see their relation to the fundamental theorems of calculus in calculus, leading to the more generalized version of Stokes' theorem in the setting of differential forms.
- Evaluate line integrals directly and by the fundamental theorem
- Analyze different forms of equations and finding their roots
- Understand relation between roots and coefficients
- Derive numerical methods for approximating the solution of problems of continuous mathematics,
- Analyze the error incumbent in any such numerical approximation,
- Implement a variety of numerical algorithms using appropriate technology
- Compare the viability of different approaches to the numerical solution of problems arising in roots of solution of non-linear equations, interpolation and approximation, numerical differentiation and integration, solution of linear systems.

#### Fifth Semester

#### MM5B01: Mathematical Analysis

After completing this course the learner should be able to

- Describe the real line as a complete, ordered field
- Determine the basic topological properties of subsets of the real numbers
- Use the definitions of convergence as they apply to sequences, and functions,
- Determine the continuity, differentiability, and integrability of functions defined on subsets of the real line
- Apply the Mean Value Theorem and the Fundamental Theorem of Calculus to problems in the context of real analysis
- Produce rigorous proofs of results that arise in the context of real analysis.
- Write solutions to problems and proofs of theorems that meet rigorous standards based on content, organization and coherence, argument and support, and style

## MM5B02: DIFFERENTIAL EQUATIONS

After studying this course the students should be able to

- Obtain an integrating factor which may reduce a given differential equation into an exact one and eventually provide its solution.
- Identify and obtain the solution of Clairaut's equation.
- Find the complementary function and particular integrals of linear differential equation.
- Familiarize the orthogonal trajectory of the system of curves on a given surface.
- Method of solution of the differential equation
- Describe the origin of partial differential equation and distinguish the integrals of first order linear partial differential equation into complete, general and singular integrals.
- Use Lagrange's method for solving the first order linear partial differential equation
- Solve differential equations of first order using graphical, numerical, and analytical methods,
- Solve and apply linear differential equations of second order (and higher),
- Solve linear differential equations using the Laplace transform technique,
- Find power series solutions of differential equations, and
- Develop the ability to apply differential equations to significant applied and/or theoretical problems.
- Demonstrate their ability to write coherent mathematical proofs and scientific arguments needed to communicate the results obtained from differential equation models
- Demonstrate their understanding of how physical phenomena are modeled by differential equations and dynamical systems
- Implement solution methods using appropriate technology.

## MM5B03: Abstract Algebra

After completing this course the learner should be able to

- Assess properties implied by the definitions of groups and rings,

- Use various canonical types of groups (including cyclic groups and groups of permutations) and canonical types of rings (including polynomial rings and modular rings),
- Analyze and demonstrate examples of subgroups, normal subgroups and quotient groups,
- Analyze and demonstrate examples of ideals and quotient rings,
- Use the concepts of isomorphism and homomorphism for groups and rings
- Produce rigorous proofs of propositions arising in the context of abstract algebra.

#### MM5B04: Fuzzy Mathematics

After the completion of this course the student will be able to:

- Understand fuzzy sets and fuzzy set operations
- To construct the appropriate fuzzy numbers corresponding to uncertain and imprecise collected data.
- To handle the real world problem in engineering having uncertain and imprecise data.
- To find the optimal solution of mathematical programming problems having uncertain and imprecise data.

#### MM5D02: Applicable Mathematics

After the completion of this course the student will be able to

- Understanding the basic operations of Mathematics
- Applies shortcut methods for solving problems
- Apply mathematical concepts and principles to perform computations
- Apply mathematics to solve real life problems
- Create, use and analyze graphical representations of mathematical relationships
- Communicate mathematical knowledge and understanding
- Apply technology tools to solve problems
- Perform abstract mathematical reasoning
- Learning dependently
- Compute limits, derivatives, and definite & indefinite integrals of algebraic, logarithmic and exponential functions
- Analyze functions and their graphs as informed by limits and derivatives



- Familiarize with basic operations on real numbers, logarithms and quadratic equations
- Identify the definitions of trigonometric ratios and their applications to problems involving heights and distance
- Get basic ideas of two dimensional geometry and graphing straight lines
- Use various methods to compute the probabilities of events
- Acquires basic ideas of derivatives, standard results and various rules for finding the derivatives of functions
- Differentiate integration from differentiation and integration of simple functions
- Acquires the basic arithmetic skills involving percentages, averages, time and rates, elementary algebra and geometry.

#### Sixth Semester

#### MM6B01: Real Analysis

After the completion of this course the student will be able to:

- Understand the term convergence
- Applies this term into problems
- Illustrate the convergence properties of power series
- Identifies Continuity and Discontinuity of various functions in different contexts
- Distinguish Uniform continuity from continuity and related theorems
- Understand partitions and their refinement
- Understand Integrability and theorems on integrability
- Recognize the difference between point wise and uniform convergence of a sequence of functions
- Illustrate the effect of uniform convergence on the limit function with respect to continuity, differentiability, and integrability

#### MM6B02: COMPLEX ANALYSIS

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

- Compute sums, products, quotients, conjugate, modulus, and argument of complex numbers

- Define and analyze limits and continuity for complex functions as well as consequences of continuity
- Conceive the concepts of analytic functions and will be familiar with the elementary complex functions and their properties
- Determine whether a given function is differentiable, and if so find its derivative
- Use differentiation rules to compute derivatives
- Write complex numbers in polar form
- Evaluate exponentials and integral powers of complex numbers
- Find all integral roots and all logarithms of nonzero complex numbers
- Apply the concept and consequences of analyticity and the Cauchy Riemann equations and of results on harmonic and entire functions including the fundamental theorem of algebra
- Find parameterizations of curves, and compute complex line integrals directly
- Understand the theory and techniques of complex integration
- Applies the theory into application of the power series expansion of analytic functions
- Understand the basic methods of complex integration and its application in contour integration.

### MM6B03: Discrete Mathematics

After the completion of this course the student will be able to

- Understand the new topics Graph Theory, Cryptography, Po set and Lattices
- Understand the basic concepts of graphs, directed graphs, and weighted graphs and able to present a graph by matrices
- Understand the properties of trees and able to find a minimal spanning tree for a given weighted graph
- Understand Eulerian and Hamiltonian graphs
- Applies the basic logic of Cryptography into various problems
- Compare and contrast a range of different cryptosystems from an applied viewpoint
- List and elaborate the differences between secret key and public key crypto systems
- Identify the different approaches to quantifying secrecy
- Recognize the different modes of operation for block ciphers and their applications
- Explain the role of hash functions in Information Security

- Discuss the place of ethics in the Information Security Area
- Recognize lattices, complete ordered sets and their varieties
- Know the standard tools of lattice theory
- Know the main representation theorems of lattices
- Be able to make use all the above both inside the theory and applications

#### MM6B04: Linear Algebra and Metric Spaces

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

- Understand the idea about vector space and metric space
- Analyze finite and infinite dimensional vector spaces and subspaces over a field and their properties, including the basis structure of vector spaces
- Use the definition and properties of linear transformations and matrices of linear transformations and change of basis, including kernel, range and isomorphism
- Compute with the characteristic polynomial, eigenvectors, Eigen values and Eigenspaces, as well as the geometric and the algebraic multiplicities of an Eigen value and apply the basic diagonalization result
- Recall the defining properties of a metric space, and determine whether a given function defines a metric
- Determine how that a function is or is not a metric
- Show that a set in a metric space is or is not open and/or closed
- Show that a function between metric spaces is or is not continuous
- Show that a sequence in a metric space is or is not convergent
- Show that a metric space is or is not complete
- Familiarize with open sets, closed sets and Cantor set

#### MM6D01: Operations Research

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

- Understand the new term LPP
- Applies the theory into different types of problems
- Understand Transportation Problem, Assignment problem and Queuing models
- Solving problems using different methods

- Formulate and model a linear programming problem from a word problem and solve them graphically in 2 and 3 dimensions, while employing some convex analysis
- Place a Primal linear programming problem into standard form and use the Simplex Method or Revised Simplex Method to solve it
- Find the dual, and identify and interpret the solution of the Dual Problem from the final tableau of the Primal problem
- Be able to modify a Primal Problem, and use the Fundamental Insight of Linear Programming to identify the new solution, or use the Dual Simplex Method to restore feasibility
- Interpret the dual variables and perform sensitivity analysis in the context of economics problems as shadow prices, input values, marginal values, or replacement values
- Explain the concept of complementary slackness and its role in solving primal/dual problem pairs
- Classify and formulate integer programming problems and solve them with cutting plane methods, or branch and bound methods
- Formulate and solve a number of classical linear programming problems and such as the minimum spanning tree problem, the assignment problem, (deterministic) dynamic programming problem, the knapsack problem, the XOR problem, the transportation problem, the maximal flow problem, or the shortest path problem, while taking advantage of the special structures of certain problems
- Understands duality theorems and dual simplex method
- Uses dual simplex method to find optimal solutions
- Explains the Transportation Problem and formulate it as an LPP and hence solve the problem
- Determine that an Assignment Problem is a special case of LPP and hence solve by Hungarian method
- Identifies the Queuing models, their various forms and methods of solutions

B.Sc. Physics

#### PROGRAMME OUTCOMES

- Read, understand and interpret physical information – vocal, statistical and graphical.

- Equip students in methodology related to Physics.
- Impart skills required to gather information from resources and use them.
- To give need based education in physics of the highest quality at the undergraduate level.
- Offer courses to the choice of the students with interdisciplinary approach.
- Perform experiments and interpret the results of observation, including making a conclusion of experimental uncertainties.
- Provide a rationally motivating environment to develop skills and aptitude of talented students to the best of their potential.
- Use Information Communication Technology to congregate knowledge at will.
- Provide an intellectual ambience to all the students to soak up the scientific attitude

#### Programme Specific Outcomes

##### SEMESTER I

##### PH01BA901 - METHODOLOGY IN PHYSICS.

##### OUTCOME:

By learning this course, students will get an introduction to the pursuit of Physics, its history and methodology. The students also learn the importance of measurement and the methodology of using different measuring devices which is central to physics.

##### SEMESTER II

##### PH02BA901-MECHANICS AND PROPERTIES OF MATTER

##### OUTCOME:

This course would empower the student to acquire engineering skills and practical knowledge, theoretical basis for doing experiments in related areas, which help the student in their everyday life. Students will gain basic knowledge for their higher studies.

##### SEMESTER III

##### PH03CR001-ELECTRONICS

OUTCOME: The physical principles and applications of Electronics which is most necessary for a Physics student is understood by this course.

#### SEMESTER IV

##### PH34CR001-ELECTRICITY AND ELECTRODYNAMICS

OUTCOME: Electricity and Electrodynamics have the key role in the development of modern technological world. Without electric power and communication facilities, life on earth stands still. By this course student get a sound foundation in electricity and electrodynamics.

#### SEMESTER V

##### PH05BAA01-CLASSICAL AND QUANTUM MECHANICS

OUTCOME: The theoretical background to study Condensed Matter Physics, Spectroscopy, Astrophysics, Electrodynamics and Nuclear Physics is gained by this course

##### PH05BA901-PHYSICAL OPTICS AND PHOTONICS

OUTCOME:

Foundation in optics and photonics is gained by this course and which prepares the students for an intensive study of advanced topics at a later stage.

##### PH05BA902-THERMAL AND STATISTICAL PHYSICS

OUTCOME: Working knowledge of statistical mechanic is gained by this course and which may be used to explore various applications related to topics in material science and the physics of condensed matter.

##### PH05BA903-DIGITAL ELECTRONICS

OUTCOME: necessary back ground for applications of electronics in mathematical computation is gainedby this course.

##### PH05DAP02-ENERGY AND ENVIRONMENTAL STUDIES

OUTCOME: The course creates concern among the students on energy conservation and environmental protection.

## SEMESTER VI

### PH06BA901-Computational Physics

OUTCOME: An insight to computer hardware and computer applications is given by this course.

### PH06BA902-NUCLEAR AND PARTICLE PHYSICS

OUTCOME: This course explores the interior of nucleus and interaction between nucleons and develops a research interest in nuclear physics.

### PH06BA903-CONDENSED MATTER PHYSICS

OUTCOME: An introduction to the physics of Condensed Matter is given by this course. Knowledge and explanation on various on T types of phenomena like electro-magnetic properties, super-conductivity and super fluidity is given.

### PH06BA904-RELATIVITY AND SPECTROSCOPY

OUTCOME: Principles of spectroscopy and its applications and basic idea of relativity is given to the students.

## COURSE OUTCOMES

### Semester I

#### PH01BA901- Methodology in Physics.

OBJECTIVES: This course will be an introduction to the pursuit of Physics, its history and methodology. The course also aims at emphasizing the importance of measurement which is central to physics.

### Semester II

#### PH02BA901-MECHANICS AND PROPERTIES OF MATTER

OBJECTIVES: This course would empower the student to acquire engineering skills and practical knowledge, which help the student in their everyday life. This syllabus will cater the

basic requirements for their higher studies. This course will provide a theoretical basis for doing experiments in related areas.

### SEMESTER III

#### PH03CR001-ELECTRONICS

OBJECTIVES: We are living in a wonder world of Electronics. To know the physical principles and applications of Electronics is most necessary for a Physics student. This course is intended to provide this know-how.

### SEMESTER IV

#### PH34CR001-ELECTRICITY AND ELECTRODYNAMICS

OBJECTIVES: Electricity and Electrodynamics have the key role in the development of modern technological world. Without electric power and communication facilities, life on earth stands still. A course in electricity and electrodynamics is thus an essential component of physics programme at graduate level. This course is expected to provide a sound foundation in electricity and electrodynamics.

### SEMESTER V

#### PH05BAA01-CLASSICAL AND QUANTUM MECHANICS

OBJECTIVES: This course is a prelude to advanced theoretical studies in Condensed Matter Physics, Spectroscopy, Astrophysics, Electrodynamics and Nuclear Physics

#### PH05BA901-PHYSICAL OPTICS AND PHOTONICS

OBJECTIVES: This course aims to provide necessary foundation in optics and photonics which prepare the students for an intensive study of advanced topics at a later stage.

#### PH05BA902-THERMAL AND STATISTICAL PHYSICS

OBJECTIVES: This course is to develop a working knowledge of statistical mechanic and to use this knowledge to explore various applications related to topics in material science and the physics of condensed matter.

#### PH05BA903-DIGITAL ELECTRONICS



OBJECTIVES: This course is expected to provide necessary back ground for applications of electronics in mathematical computation.

#### PH05DAP02-ENERGY AND ENVIRONMENTAL STUDIES

OBJECTIVES: The course creates concern among the students on energy conservation and environmental protection.

#### SEMESTER VI

#### PH06BA901-Computational Physics

OBJECTIVES:: This course is intended to give an insight to computer hardware and computer applications.

#### PH06BA902-NUCLEAR AND PARTICLE PHYSICS

OBJECTIVES: This course intended to explore the interior of nucleus and interaction between nucleons

#### PH06BA903-CONDENSED MATTER PHYSICS

OBJECTIVES:: This course is intended to provide an introduction to the physics of Condensed Matter. This study attempts to explain various types of phenomena like electromagnetic properties, superconductivity and super fluidity

#### PH06BA904-RELATIVITY AND SPECTROSCOPY

OBJECTIVES: This course is intended to introduce principles of spectroscopy and special theory of relativity.

### **B.Sc. Chemistry**

#### Program Outcomes

PO1. Critical Thinking: Students are skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems.

PO2. Problem Solving Skills: Students are able to solve problems competently by identifying the essential parts of a problem and formulating a strategy for solving the problem. They are

able to rationally estimate the solution to a problem, apply appropriate techniques to arrive at a solution, test the correctness of the solution, and interpret their results.

PO3. Communication Skills: Students are able to communicate effectively their views and ideas clearly in person and through modern media in English and in their mother tongue.

PO4. Modern Tool Usage: Graduates will be able to use computers in data acquisition and processing and use available software as a tool in data analysis.

PO5. Social Responsibility: Students are trained to be an individual with concern for the society they live and to contribute at maximum, their skills and knowledge in the broadest context, for the development of the nation.

PO6. Ethics: Stay firm on the value systems of their culture, including their own for a healthy socio cultural environment.

PO7. Environment and Sustainability: Students are able to appreciate the central role of chemistry in our society and use this as a basis for ethical behaviour in issues facing chemists including an understanding of safe handling of chemicals, environmental issues and key issues facing our society in energy, health and medicine.

PO8. Self-directed and Life-long Learning: Acquire the ability to engage in independent and self- learning as well as to successfully pursue their career objectives in advanced education and in professional courses, in a scientific career in government or industry, in a teaching career in the school systems, or in a related career following graduation.

Program Specific Outcomes:

The B.Sc. Chemistry Program is successful in imparting the students with the following qualities.

PSO1: Students have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in Analytical, Inorganic, Organic and Physical branches of chemistry.

PSO2: Acquired the knowledge of terms, facts, concepts, processes techniques and principles of the subject.

PSO3: Developed the ability to apply the principles of Chemistry.

PSO4: Are inquisitive towards advanced chemistry and developments therein.

PSO5: Are able to appreciate the achievements in Chemistry and to know the role of Chemistry in nature and in society.

PSO6: Developed problem solving skills.

PSO7: Familiarized with the emerging areas of Chemistry and their applications in various spheres of Chemical sciences and to apprise the students of its relevance in future studies.

PSO8: Developed skills in the proper handling of apparatus and chemicals.

PSO9: Are exposed to the different processes used in industries and their applications.

#### Course Outcomes

##### Course: General and Analytical Chemistry

CO1: Have broad outline of the methodology of science in general and Chemistry in particular

CO2: Understand the important analytical and instrumental tools used for practicing chemistry

CO3: Learn computer based presentation and statistical analysis of data using spreadsheet software

CO4: Apply these skills in the analysis of experimental data in chemistry practical.

##### Course: Theoretical and Inorganic Chemistry

CO1: Study the various atom models

CO2: Understand the important features of the quantum mechanical model of the atom.

CO3: Study the periodic properties of elements

CO4: Explain the formation of different types of bonds

CO5: Predict the geometry of simple molecules

CO6: Explain the different types of hybridization and draw shapes of simple covalent molecules

CO7: Understand the molecular orbital theory of diatomic molecules

CO8: Develop interest in various branches of inorganic chemistry.

CO9: Study nuclear models and nuclear reactions.

Course: Fundamentals of Organic chemistry

CO1: Have a basic understanding about the classification and nomenclature of organic compounds, fundamentals of organic reaction mechanism, aromaticity and stereochemistry

CO2: Students capable of understanding and studying organic reactions

CO3: Have exposure to various emerging new areas of organic chemistry

CO4: Develop skills required for the qualitative analysis of organic compounds

Course: Basic Organic Chemistry-I

CO1: Learn the chemistry of alcohols, phenols, carboxylic acids, derivatives of Carboxylic acids, Sulphonic acids, carbonyl compounds, poly nuclear hydrocarbons, active methylene compounds and Grignard reagents.

CO2: Understand and study Organic reaction mechanisms.

Course: Chemistry of d and f block elements

CO1: Understand the general characteristics of the d and f block elements.

CO2: Study the physical and chemical properties of d and f block elements.

CO3: Study the Werner's theory of coordination compounds.

CO4: Study isomerism in metal complexes.

CO5: Study the bonding in coordination compounds.

CO6: Understand the applications of coordination compounds.

CO7: Understand the classification, properties and applications of organo metallic compounds.

CO8: Study the methods of preparation, properties, structure and bonding of metal carbonyls and metal clusters.

CO9: Understand the role of metals in biological systems.

Course: Basic Organic Chemistry-II

CO1: Learn the chemistry of nitro compounds, amines, dyes, organic polymers, soaps, detergents and organic reagents.

CO2: Understand and study mechanism of reactions of nitro compounds and amines.

CO3: Have an elementary idea of chemotherapy, organic spectroscopy and photochemistry

CO4: Identify organic compound using UV, IR and PMR spectroscopic techniques

CO5: Develop basic skills required for crystallization, distillation, solvent extraction, TLC and column chromatography.

Course: States of matter

CO1: Study the intermolecular forces in gases and liquids

CO2: Understand the dynamics of the molecules in the gases and liquids

CO3: Study liquefaction of gases

CO4: Learn the structure of solids

CO5: Study defects in crystals

CO6: Study adsorption.

Course: Quantum Mechanics and Spectroscopy

CO1: Differentiate between classical and quantum mechanics

CO2: Study the postulates of quantum mechanics and the quantum mechanical model of the hydrogen atom

CO3: Study valence bond and molecular orbital theory

CO4: Study the principle and applications of microwave, infra red, Raman, electronic and magnetic resonance spectroscopy.

CO5: Study the fundamentals of mass spectrometry

CO6: Study the fundamentals of photochemistry

Course: Applied Inorganic Chemistry

CO1: Understand the principle of inorganic qualitative analysis

CO2: Understand thermodynamic concepts in the extraction of metals

CO3: Understand the applications of radioactivity and radioisotopes

CO4: Understand the preparation and uses of inorganic polymers

CO5: Understand preparation and application of nano materials

CO6: Understand the chemistry of refractory and ceramic materials

CO7: Understand the chemistry of the compounds of p block elements

CO8: Understand thermal and chromatographic techniques

Course: Chemistry of Natural products and Bio molecules

CO1: Learn in detail the chemistry of carbohydrates, heterocyclic compounds, amino acids, proteins and nucleic acids

CO2: Have a thorough idea on the structures of carbohydrates and some heterocyclic compounds.

CO3: Understand the structure and functions of enzymes, proteins and nucleic acids.

CO4: Study the fundamentals of terpenoids, alkaloids, vitamins, lipids and steroids

CO5: Have an elementary idea of supramolecular chemistry and Green Fluorescent Proteins

Course: Equilibrium and Kinetics

CO1: Study the laws of thermodynamics

CO2: Derive Gibbs-Helmholtz, Clausius-Clapeyron, Gibbs-Duhem equations

CO3: Derive the relation between  $K_p$ ,  $K_c$  and  $K_x$

CO4: Derive the phase rule

CO5: Derive the rate equations for zero, first and second order reactions

CO6: Study the phase diagrams of one and two component systems

CO7: Understand the theories of chemical kinetics

CO8: Acquire an elementary idea of catalysis including enzyme catalysis.

Course: Solution Chemistry

CO1: Study the behaviour of binary liquid mixtures, CST, azeotropes, colligative properties

CO2: Study solubility of gases in liquids,

CO3: Study ionic equilibria and electrical properties of ions in solution.

CO4: Study the concepts of acids and bases, pH and buffer solutions

Course: Polymer Chemistry

CO1: Know about the types of polymers and the chemistry of polymerisation.

CO2: Understand the physical properties of polymers, their reactions and degradation.

CO3: Acquire knowledge about the polymerisation techniques and polymer processing.

CO4: Know the chemistry of individual polymers, their preparation and properties

CO5: Have an idea about the recent advances in polymer science

### **B.Sc. Zoology**

Programme Outcomes

By the end of B Sc programme in Zoology, a student will:

1. Acquire basic knowledge of various branches of Zoology and General biology.
2. Inculcate interest and love of nature with its myriad living creatures.
3. Understand the unity of life with the rich diversity of organisms.

4. Be aware of the ecological and evolutionary significance of the organisms in the environment
5. Acquire basic skills in observation and study of nature.
6. Learn the different biological techniques.
7. Develop experimental skills and research aptitude.
8. Acquire basic knowledge and skills in applied branches of zoology which will enable them for self- employment
9. Become aware of the need for conservation of the biosphere.
10. Be skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems.
11. Be able to communicate effectively their views and ideas on different issues related to biology
12. Be equipped to use computers in data acquisition and processing and use available software as a tool in data analysis.
13. Stay firm on the value systems of their culture and work for a healthy socio-cultural environment.
14. Acquire the ability to engage in independent and self- learning.
15. Successfully pursue their career objectives in advanced education, professional courses, scientific career, teaching career in the school systems or related career following graduation.

#### PROGRAMME SPECIFIC OUTCOMES

The graduate of this programme will be able to:

1. Scientifically identify and list out common animals.
2. Identify the role of different animals in the environment.
3. Develop skills to culture the economically beneficial animals and thus open opportunity for self -employment.



4. Develop respect for nature.
5. Analyze the impact of anthropogenic activities on environment.
6. Explain the role and impact of different environmental conservation programmes.
7. Understand various physiological processes in living organisms.
8. Identify various potential risk factors to health of humans.
9. Understand various genetic abnormalities and their reasons.
10. Understand the importance of modern branches of science like genetic engineering for the improvement of human race.
11. Use tools of information technology for all activities related to zoology

#### SEMESTER 1

Course : General Methodology And Perspectives In Science

Course Outcomes:

- Awareness of the basic philosophy of science, its history, concepts and scope
- Develop proper scientific mind, culture and work habits
- Familiarize with the basic tools and techniques of scientific study with emphasis on biological sciences
- Develop basic knowledge on various sciences and definitions of scientific terms
- Awareness on role of research in science

#### SEMESTER 2

Course : Biodiversity And Modern Systematics

Course Outcomes:

- Appreciation on diversity of life on earth
- Understand different levels of biological diversity

- Familiarize taxa level identification of animals
- Learn biodiversity estimation techniques
- Create interest for conservation of biodiversity
- Develop Basic knowledge on the living world, plant and animal kingdom
- Acquire knowledge on biodiversity and its conservation
- Be trained on biological classification and representative organism of major taxa

### SEMESTER 3

Course : Animal Diversity- Non Chordata

Course Outcomes:

- Scientifically classify invertebrate fauna
- learn the physiological and anatomical peculiarities of some invertebrate phyla
- Understand evolutionary significance of various invertebrate fauna
- Generate curiosity in living things around them

### SEMESTER 4

Course : Animal Diversity- Chordata

Course Outcomes

- Generate interest in student to observe the diversity among chordates
- Identify systematic position of the different chordates
- Learn the physiological and anatomical peculiarities of some vertebrate phyla
- Understand evolutionary significance of various vertebrate fauna
- Awareness of the economic importance of some classes

### SEMESTER 5

Course : Cell Biology And Molecular Biology

#### Course Outcomes:

- Awareness of different cell organelles, their structure and role in living organisms
- Understand the nature of genetic materials at molecular level, their expression and regulation
- Develop critical thinking, skill and research aptitudes
- Acquire knowledge about living forms at the molecular level

#### Course : Environmental Biology, Toxicology and Disaster Management

#### Course Outcomes:

- Develop basic knowledge on ecosystems and their functioning
- Awareness about food chain, food web and energy flow
- General awareness on pollution and their impacts
- Awareness about various types of anthropogenic pressures on ecosystem
- Participate in designing programmes which will mitigate environmental problems
- Become aware of toxicants, their impacts on human health and environment and remedial measures
- Awareness about disasters, prevention and mitigation measures

#### Course : Evolution, Zoogeography And Ethology

#### Course Outcomes

- Acquire knowledge about the evolutionary history of earth (living and non living)
- Learn various tools and techniques for evolutionary studies
- Learn the distribution of animals on earth, its pattern, evolution and causative factors
- Acquire basic knowledge on animal behavioral patterns and their role
- Acquire Basic knowledge on principles of inheritance and variation

- Awareness on molecular basis of inheritance
- A thorough understanding on the mechanism and factors affecting evolution
- Knowledge on origin and evolution of man

Course : Biochemistry, Human Physiology and Endocrinology Course Outcomes

- Deep knowledge in biochemistry, physiology and endocrinology
- Understanding various aspects of physiological activities of animals with special reference to humans
- Acquire a broad understanding of the hormonal regulation of physiological processes in invertebrates and vertebrates
- Develop a basic understanding of the experimental methods and designs that can be used for further study and research
- Understanding of the various disorders in animals and their causes

SEMESTER 6

Course : Reproductive and Developmental Biology Course Outcomes

- Acquire basic understanding of the experimental methods and designs related to development in animals
- Awareness about the impact of environment on development in animals
- Understanding of the patterns of reproduction in animals and birth defects
- Provide a basis for further research works related to betterment of human health

Course : Genetics and Biotechnology Course Outcomes

- Understanding of the central role of genetics and biotechnology in the life of all organisms
- Learn the concepts related to inheritance of characters in organisms
- Develop critical thinking skill and research aptitude in frontier areas of the biological science

- Understand the basic techniques in genetic engineering and its applications
- Acquire knowledge of the scope of genetic engineering in treatment of diseases

Course : Microbiology and Immunology Course Outcomes

- Generate interest in frontier areas of biological sciences
- Awareness of the pathogens, health related problems, their origin and treatment
- Awareness regarding knowledge of modern developments and recent trends in biological sciences
- Generate awareness regarding methods for the prevention of diseases
- Motivate the students towards a healthy lifestyle

Course : General Informatics, Bioinformatics and Biostatistics Course Outcomes

- Awareness regarding the frontier areas of biological sciences
- Be skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems
- Develop systematic approach in analysing biological information
- Become equipped to use computers in data acquisition and processing and use available software as a tool in data analysis
- Updates and expands basic informatics skills and attitudes relevant to the emerging knowledge of society and also to equip the students to effectively utilize the digital knowledge resources in learning

### **B.Sc. Botany:**

PROGRAM OUTCOMES:

By the end of B.Sc program in Botany, a student will:

1. Acquire basic knowledge of various branches of Botany
2. Inculcate interest and love of nature with its myriad life forms

3. Acquire basic skills in the observation and study of nature
4. Be exposed to the diversity among life forms and understand the unity behind diversity
5. Be aware of the ecological and evolutionary significance of the various life forms in the environment
6. Learn the different biological techniques
7. Develop a scientific attitude which makes her open minded, critical and curious
8. Develop ability for the application of the acquired knowledge in life and become self-reliant and self sufficient
9. Develop an ability to work on their own and to make them fit for the society
10. Acquire awareness of the conservation of the biosphere
11. Develop skill in practical work, experiments, equipment and laboratory use along with collection and interpretation of biological materials and data
12. Acquire the ability to engage in independent and self- learning
13. Be aware of natural resources and environment and the importance of conserving it
14. Be able to communicate effectively their views and ideas on different issues related to biology
15. Be equipped to use computers in data acquisition and processing and use available software as a tool in data analysis.
16. Appreciate and apply ethical principles to biological science research and studies
17. Successfully pursue their career objectives in advanced education, professional courses, scientific career, teaching career in the school systems or related career following graduation.

#### PROGRAMME SPECIFIC OUTCOMES

The graduate of this programme will be able to:

1. Know the importance and scope of the discipline
2. Acquire a firm foundation in every aspect of Botany

3. Have an understanding of the broad spectrum of modern trends in Botany
4. Do lifelong learning due to attention drawn to the world of plants and introduction to the methodology of systematic academic enquiry
5. Scientifically identify and list out plants in their locality
6. Identify the role of different plants and their mode of survival in the environment
7. Develop skills to cultivate the economically beneficial plants and thus open opportunity for self-employment
8. Develop love and respect for nature
9. Analyze the impact of deforestation on environment
10. Explain the role and impact of different environmental conservation programme
11. Become an ambassador of sustainable development of our country
12. Understand the importance of modern branches of science like Biotechnology for the economic benefits of agriculture
13. Use tools of information technology for all activities related to Botany

#### Semester 1

Course: Methodology and Perspectives of Science & An Introduction to the World of Plant Diversity

#### Course Outcomes

- Learn scientific methods, culture and work habits
- Awareness on role of research in science
- Awareness of the basic philosophy of science, its history, concepts and scope
- Develop Basic knowledge on the living world and especially plant kingdom
- Understand the diversity and underlying unity in plant world

#### Semester 2

Course: General Informatics and Methodologies in Plant Sciences

Course Outcomes

- Familiarizewith the use of computers
- Learn to use information technology for learning purpose
- Familiarize with the basic tools and techniques of scientific study with emphasis on biological sciences
- Learn the different bio statistics techniques and their use in different purposes
- Get an idea on research methodology

Semester 3

Course: MICROBIOLOGY AND PHYCOLOGY

Course Outcomes

- Understand the world of microbes
- Have an idea on diverse groups of plants
- Understand the identifying characters of the lower groups of plants
- Awareness of the various ecological roles of lower forms of plants
- Understand the application of microbiology in different fields.

Semester 4

Course: ANATOMY AND REPRODUCTIVE BOTANY OF ANGIOSPERMS

Course Outcomes

- Imparts an insight into the internal structure and reproduction of the most evolved group of plants, the Angiosperm
- Identifies role of anatomy in solving taxonomic and phylogenetic problems
- Understand the structural adaptations in plants growing in different environments



- Learn the life cycle pattern of Angiosperms
- Understand the morphology and development of reproductive parts
- Get an insight in to the fruit and seed development

Semester 5

Course: MYCOLOGY, LICHENOLOGY AND PLANT PATHOLOGY

Course Outcomes

- Understand the diversity of fungal and lichen world and its significance
- Awareness of the various plant diseases and their impact on agriculture
- Familiarize with the various measures adopted to control plant diseases

Course: ENVIRONMENTAL SCIENCE AND ECOTOURISM

Course Outcomes

- Awareness of the significance of Environmental Science
- Understand the extent, limitations and depletion of natural resources
- Learns about the need of sustainable utilization of natural resources.
- Understand the structure and function of the Ecosystems and the nature and interactions of populations in the ecosystem
- Understand various kinds of pollution in the environment, their impacts on the ecosystem and their control measures
- Learn the various environmental laws in India
- Awareness about the role of various movements in the protection of nature and natural resources
- Understanding the extent of the total biodiversity and their conservation
- Can assess the positive and negative impacts of Ecotourism and its role in the sustainable utilization of resources for tourism.

## Course: GENETICS, PLANT BREEDING AND HORTICULTURE

### Course Outcomes

- Understand the basic principles of heredity
- Understand the inheritance pattern of nuclear and extra nuclear genes
- Understand the methods of crop improvement
- Understand the importance of horticulture in human welfare

## Course: CELL MOLECULAR BIOLOGY AND EVOLUTION

### Course Outcomes

- Understand the Ultra structure and functioning of cell in the sub microscopic and molecular level
- Get an idea of origin, concept of continuity and complexity of life activities.
- Familiarization of life process
- Understand the basic and scientific aspect of diversity
- Learn the cytological aspects of growth and development
- Awareness DNA as the basis of heredity and variation
- Understand the concept of evolution as the basis of biodiversity

## Semester 6

## Course: PLANT PHYSIOLOGY AND BIOCHEMISTRY

### Course Outcomes

- Understand the basic principles related to various physiological functions in plant life
- Familiarize with the basic skills and techniques related to plant physiology
- Understand the role, structure and importance of the bio molecules associated with plant life

- Familiarize with the recent trends in the field of plant physiology
- Awareness of applied aspects of plant physiology in fields like agriculture

Course: BRYOLOGY, PTERIDOLOGY, GYMNOSPERMS & PALEOBOTANY

Course Outcomes

- Understand the diversity in habits, habitats and organization of various groups of plants
- Understand the evolutionary trends in plants
- Identify the anatomical variations in lower groups of plants
- Understand the significance of Paleobotany

Course :

ANGIOSPERM MORPHOLOGY, SYSTEMATIC BOTANY AND ECONOMIC BOTANY

Course Outcomes

- Acquaint with the aims, objectives and significance of taxonomy
- Identify the common species of plants growing in Kerala and their systematic position
- Develop inductive and deductive reasoning ability
- Acquaint with the basic technique in the preparation of herbarium
- Familiarizing with the plants having immense economic importance

Course: BIOTECHNOLOGY AND BIOINFORMATICS

Course Outcomes

- Familiarize with the fundamental principles of biotechnology, various developments in biotechnology and potential applications
- Awareness about the wise use of life forms for human advancement
- Get an introductory knowledge about bioinformatics
- Usage of computers to handle biological data base

