# Programme Outcomes,

# Programme Specific Outcomes (PSOs) and

# Course Outcomes (COs) of Under Graduate Programmes

# Content

# PROGRAMME OUTCOMES (POs)

**PO1**: Evolve to a committed and compassionate human being respecting the dignity of every individual

**PO2**: Communicate effectively and possess scientific temper and modern outlook of the world

**PO3**: Develop ecological consciousness and imbibe the principles of Swachh Bharat in deeds and actions

**PO4**: Engage in life-long learning to acclimatize themselves in an ever changing world

**PO5**: Work effectively as an individual, and as a team member

**PO6**: Apply the scientific knowledge acquired in classrooms and labs in real-life situations and be motivated and ready to pursue higher education

**PO7**: Become worthy global citizens who will emerge as future leaders, entrepreneurs and efficient administrators

# BA Economics (Model 1)

**(CBCS-Under Graduate Degree Programme, 2017 admission onwards, MG University)**

## PROGRAMME SPECIFIC OUTCOMES (PSO)

Upon successful completion of BA Economics programme, a student will be able to:

PSO1: Create a deep knowledge in the subject and there by prepare them for employment and future studies.

PSO2: Master the ability to forecast the effectiveness of the policies made by the government and other agencies.

PSO3: Develop a comprehensive knowledge about the historic, political and economic features of our nation and the world.

PSO4: Evaluate various social and economic problems in the society and develop answers to the problems as global citizens.

PSO5: Acquire skills to enhance the economic way of thinking and research.

# COURSE OUTCOMES (COs)

## CORE COURSE

## SEMESTER 1

### EC1CRT01 Perspectives and Methodology of Economics

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

CO1- Outline the nature, subject matter and importance of learning economics and how economics differ from other science and social science streams.

CO2- Discuss about the tools and basic models of Economics.

CO3- Assess the difference between various schools of thought in Economics.

CO4- Discuss the concepts of research designing

CO5- Illustrate the methods of data collection and analysis by setting a hypothesis

## SEMESTER 2

### EC2CRT02 Micro Economic Analysis I

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

CO1- Restate the fundamental ideas and basic models of Microeconomics.

CO2- Assess the market equilibrium, forecasting and its key players-Demand and Supply

CO3- Analyze the consumer behaviour using cardinal, ordinal and modern utility norms.

CO4- Identify the various cost concepts related to firm's decision making

CO5- Illustrate the optimum production of a firm, theoretically and empirically.

## SEMESTER 3

### EC3CRT03 Micro Economic Analysis II

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

CO1- Assess the concept of market and different types of market faced by an individual firm

CO2- Evaluate the equilibrium of firm under the market conditions of perfect competition, monopoly, monopolistic competition and oligopoly.

CO3- Construct the price determination of various factors of production.

CO4- Explain functional relationship and various theories of factor market.

CO5- Discuss the fundamentals and basic theories of welfare economics.

**EC3CRT04 Economics of Growth & Development**

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

CO1- Conceptualize growth and development using various indices.

CO2- Rate the various issues and theories of growth and development.

CO3- Evaluate the importance of education, health and nutrition for economic development.

CO4- Assess how development in related with poverty and population

CO5- Explain how gender equality is important to economic development.

**SEMESTER 4**
**EC4CRT05 Macro Economics I**

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

CO1- Illustrate the different types of macroeconomic models

CO2- Discuss the importance of microeconomics in daily life and the difference between microeconomics and macroecomics.

CO3- Assess the concept of national income and various methods of calculating national income.

CO4- Rate the classical school of economics and their basic macroeconomic theories.

CO5- Assess the contributions of J.M. Keynes to macroeconomics and analyze the Keynesian consumption function

CO6- Discuss the Orthodox Keynesian models in macroeconomics.

**EC4CRT06 Public Economics**

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

CO1- Identify the concepts of public finance, public goods and the difference between public and private finance.

CO2- Interpret the various sources of public revenue and theories related to public revenue.

CO3- Analyze various types of taxation as a source of revenue to the government.

CO4- Illustrate the need public expenditure and public debt with the help of supporting theories.

CO5- Evaluate the financial relationship between Centre government and state governments in India.

**SEMESTER 5**

**EC5CRT07 - Quantitative Techniques**

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

CO1 – Solve problems on basic mathematical methods like progression, interest, Net Present Value

CO2 – Use differential calculus to find the maxima and minima in case of economic functions

CO3 – Discuss various types of functions and solve problems on set theory, matrices and different types of equations

CO4 – Compute the probability of events and explain the type events, the addition rule and multiplication rule of probability

CO5 – Illustrate the use of Binomial and Normal distributions to calculate the probability

**EC5CRT08 Macro Economics II**

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

CO1- Rate various theories related to consumption and investment.

CO2- Inspect the relationship between money, inflation and unemployment and compose solutions for the problems related to inflation

CO3- Discuss the measurement of money supply and inflation in India.

CO4- Analyze the importance of fiscal policy and monetary policy in framing an economy.

CO5- Evaluate post Keynesian and recent developments in macroeconomics.

**EC5CRT09 Environmental Economics**

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

CO1- Discuss the importance of preserving natural resources and ecosystem.

CO2- Identify different types of pollutions and other hazards and assess its negative impact on environment.

CO3- Explain various national and international laws that are designed to protect the nature.

CO4- Use economic models to analyze various environmental problems.

CO5- Restate the role of the UNO and other international agencies to protect human rights and environmental rights.

**EC5CRT10 Introductory Econometrics**

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

CO1- Illustrate the idea of regression analysis and design it to interpret economic data.

CO2- Construct and verify the hypotheses used for analysing economic data.

CO3- Solve statistical tests to investigate whether the classical assumptions of regression are satisfied.

CO4- Design new econometric models and rate various econometric models available in economics literature.

**EC5OPT03 Gender Economics**

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

CO1- Explain the basic concepts of gender and assess various indicators of gender development and equality

CO2- Discuss how gender is related to poverty, health, education and demography

CO3- Analyse the reasons for gender inequality around the globe and particularly in India.

CO4 - Explain national and international policies to promote gender equality and discuss about international agencies that supplement the same.

**SEMESTER 6**

**EC6CRT11 - Quantitative Methods**

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

CO1 – Discuss the basic concepts of statistics and its application in Economics

CO2 - Identify appropriate sampling and data collection methods for a given situation

CO3 - Calculate measures of central tendency and measures of dispersion in grouped and ungrouped data cases

CO4 – Identify the type of linear relationship using scatter plot and correlation coefficient

CO5 – Employ regression technique to model pattern in the data and to make predictions data collection.

CO6 - Demonstrate understanding of the concepts of time series and the measurement of trend

**EC6CRT12 International Economics**

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

CO1- Compare and contrast various traditional and modern theories in international economics

CO2- Compose the Balance of Payment and Balance of Trade statistics of an economy

CO3- Rate the gains from international trade and assess trade policies.

CO4- Evaluate the functioning of foreign exchange market and its movements.

CO5- Discuss about various international agencies and their relations with the member nations.

**EC6CRT13 Money & Financial Markets**

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

CO1- Analyse the functioning of banking and non banking financial institutions in India.

CO2- Explain the functions of money in general and the money demand and supply in India in particular.

CO3- Illustrate the structure and functioning of Indian money market.

CO4- Discuss the structure and assess the functions of Indian capital markets

CO5- Evaluate the operations and trends in equity market, derivative market and other kinds of financial markets through out the world.

**EC6CRT14 Indian Economy**

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

CO1- Explain the structural changes in the Indian economy over the years and changes in the role of government as an active economic agent.

CO2- Discuss the demographic features and changes in India over the years as a result of India's population policy

CO3- Assess the role of agricultural, industrial and service sectors in development of Indian economy.

CO4- Examine the role of Planning Commission in India's economic development and the functions of NITI Ayog as a promoter of economic development.

CO5- Illustrate the economic, social and demographic changes in Kerala economy as a result of Kerala's specific model of development.

**EC6CBT03 History of Economic Thought**

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

CO1- Assess the methodological evolution and explain history of economic thought.

CO2- Identify and evaluate the contributions of all the ancient schools of economic thought.

CO3- Evaluate the pros and cons of various intellectual streams in Economics.

CO4- Explain the ideas and contributions of Indian economists from Kautilya to Amartya Sen.

## COMPLIMENTARY COURSES

## 1. HISTORY

### SEMESTER 1

### HY1CMT02 - Social Formations in Pre- Modern India

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

CO1- Explain the historical construction of India's ancient past civilizations.

CO2- Compare and contrast how Feudalism affected the social and cultural scenario of India.

CO3- Illustrate the vast culture and cultural changes in South India.

CO4- Discuss the social formation occurred in the period of Mughals and how it influences the present Indian society.

### SEMESTER 2

### HY2CMT04 - History of the Freedom Movement in India

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

CO1- Explain the importance and consequences of India's First War of Independence.

CO2- Investigate how First World War changed the social and political history of India.

CO3- Evaluate how various freedom struggles overtime contributed to India's Independence.

CO4- Rate how Gandhian ideologies influenced India's freedom struggle and formation of a new India.

CO5- Discuss the role of Dr.B.R. Ambedkar in framing India's constitution.

## 2. POLITICS

**SEMESTER 3**

### PS3CMT01 An Introduction to Political Science

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

CO1- Explain the importance of the subject Political Science and major concepts used in the subject.

CO2- Discuss the idea of State and the role of State in modern world.

CO3- Examine the constitutional design and institutional framework of government.

CO4- Restate and analyze various political ideologies and their contributions to the society.

**SEMESTER 4**

### PS4CMT05 Indian Constitution: Social Issues in India

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

CO1- Describe the history of formation of Indian Constitution after India's freedom.

CO2- Discuss the salient features of Indian constitution and its structure.

CO3 - Explain the fundamental rights and duties of an Indian citizen.

CO4- Illustrate the relationship between the Centre and state governments and with the decentralized bodies.

CO5- Outline the structure of Indian political system and recommend solutions for the challenges faced by the Indian political system

# BA English (Model II - Teaching English in Lower Classes)

**(CBCS-Under Graduate Degree Programme, 2017 admission onwards, MG University)**

## PROGRAMME SPECIFIC OUTCOME (PSO)

PSO 1: Develop skill sets required for teaching lower classes.

PSO 2: Ability to use better English language skills for career advancement.

PSO 3: Identify more avenues in the teaching profession world over.

PSO 4: Become competent in the teaching of literary works looking at its various nuances compelling thought and perspective.

PSO 5: Outline various genres in English Literature and do a comprehensive study of the structural and aesthetic components constituting the same.

## COURSE OUTCOMES (COs)

**(A) COMMON COURSES**

**SEMESTER 1**

**Course Title- Fine Tune Your English**
**Course Code- EN1CCO1**

CO 1: Become competent in the use of English Grammar and vocabulary.

CO 2: Become capable of effective communication skills.

CO 3: Use English language as a tool for career advancement.

CO 4: Identify common errors in English to better academic writing skills.

**SEMESTER 2**

**Course Title- Issues That Matter**
**Course Code- EN2CCO3**

CO 1: Become aware of issues of concern that are of contemporary relevance.

CO 2: Develop a rational and empathetic outlook on such matters.

CO 3: Become active participants in promoting sustainable measures for protecting our environment.

CO 4: Examine colonialism through the lens of issues faced by the colonized natives.

**SEMESTER 3**

**Course Title- Literature and/as Identity**
**Course Code- EN2CCO5**

CO 1: Evaluate the issues concerning diasporic identity through literature.

CO 2: Analyse the conflict ridden experiences of people belonging to crisis affected regions of South Asia.

CO 3: Examine the literary creations by authors of their life experiences to understand the question of identity representation and its relevance.

CO 4: Investigate the distinctiveness of native communities to decipher their history, tradition and culture.

**SEMESTER 4**

**Course Title- Illuminations**
**Course Code- EN2CCO7**

CO 1: Discuss motivating stories in literature.

CO 2: Engage with examples of those people who have overcome various hardships in life and emerged successful in their respective fields.

CO 3: Develop an optimistic attitude in life.

CO 4: Locate various works in specific categories of writing, taking into notice the expansiveness of the literary output.

**(B) VOCATIONAL COURSES**

**SEMESTER 1**

**Course Title-School Organisation**
**Course Code- EN1VO01 (T)**

CO 1: Discuss the administrative aspects behind the running of a school in India in detail.

CO 2: Outline the powers and responsibilities of authorities concerned in the system of management of a school.

CO 3: Analyse the importance of examination and other assessment mechanisms.

CO 4: Illustrate the constitution of student bodies and parent-staff associations in a school.

**SEMESTER 2**

**Course Title- Conversational English**
**Course Code- EN2VO02 (T)**

CO 1: Explain the relevance of better language skills in society.

CO 2: Plan conversation skill improvement sessions through e-tivity exercises with the aid of language lab.

CO 3: Analyse the use of vocabulary in various registers.

CO 4: Select a suitable matrix in evaluating the language skill potential of students through various assessment methods.

**SEMESTER 3**

**Course Title- Methodology of Teaching English**
**Course Code- EN3VO03 (Tc)**

CO 1: Analyse the principles behind learning a foreign language.

CO 2: Discuss various methodologies behind teaching English.

CO 3: Describe the application of teaching methodology through practical sessions in select schools.

CO 4: Design new methodologies in teaching English based on the potential of students.

**SEMESTER 4**

**Course Title- Educational Technology**
**Course Code- EN4VO04 (Tc)**

CO 1: Explain various technical aid in teaching with the help of language lab.

CO 2: Design teaching plans based on the curriculum.

CO 3: Explain the importance of promoting active learning behaviour in classrooms.

CO 4: Construct ways of facilitating online classroom environment more accessible for the students.

**(C) COMPLEMENTARY COURSES**

## SEMESTER 1

**Course Title- Education in India**
**Course Code- EN1CM01 (T)**

CO 1: Outline an in-depth study of the development of education system in India.

CO 2: Devise various methods for teaching English to Indian students.

CO 3: Examine the role of Education in Indian Democracy.

CO 4: Identify the best method of teaching students in accordance with the differing classroom environments.

## SEMESTER 2

**Course Title- Educational Psychology**
**Course Code- EN2CM02 (T)**

CO 1: Explain the relevance of educational psychology through the study of various experiments done in the field.

CO 2: Devise teaching methodology for students belonging to different categories from advanced learners to slow learners.

CO 3: Inspect various stages in the development of a student from childhood to adolescence to familiarise the target audience.

CO 4: Plan methods to bring slow learners to improve their learning abilities.

## SEMESTER 3

**Course Title- The Evolution of Literary Movements: The Shapers of Destiny**
**Course Code- EN3CM03**

CO 1: Analyse the history of Britain to contextualise various works in British Literature.

CO 2: Assess how historical events help shape the present.

CO 3: Explain literature as a way of representing History through the study of literary background constituting British Literature.

CO 4: Examine British culture and tradition in order to have a better awareness about the Island nation.

**SEMESTER 4**

**Course Title- The Evolution of Literary Movements: The Cross Currents of Change**
**Course Code- EN4CM04**

CO 1: Examine various social movements that had the effect of changing the cultural fabric of society.

CO 2: Analyse the discourse of subaltern studies with special emphasis on gender studies and anti- Dalit protests.

CO 3: Investigate the theories associated with enlightenment philosophy that propagated the virtues of humanism.

CO 4: Outline the history of Kerala Renaissance and how it resulted in social awakening of the masses against caste based discrimination.

## (D) CORE COURSES

### SEMESTER 1

**Course Title- Methodology of Literary Studies**
**Course Code- EN1CR01**
CO 1: Outline the history of English literature.

CO 2: Analyse the basics of literary theory starting from the traditional approach.

CO 3: Explain basic literary terms that will enable a bridge to understanding the fundamentals of literary theory and criticism.

CO 4: Inspect into contemporary trends in literary theory and criticism.

### SEMESTER 2

**Course Title- Introducing Language and Literature**
**Course Code- EN2CR02**
CO 1: Analyse the evolution of English language and various theories associated with the same.

CO 2: Outline the overview of different ages in the history of English literature as a preface to various literary works.

CO 3: Explain various theories involving film studies to help read movies with a critical point of view.

CO 4: Inspect loan words from other languages into English as a process of analyzing cultural exchange between geographical areas.

### SEMESTER 3

**Course Title- Harmony of Prose**
**Course Code- EN3CR03**
CO 1: Analyse prose literature both Western and Non- Western.

CO 2: Explain different ways of writing prose texts in detail.

CO 3: Investigate the texts in writing with the perspective of enhancing academic writing skills.

**Course Title- Symphony of Verse**
**Course Code- EN3CR04**
CO 1: Examine rules of prosody with the perspective of understanding the language of poetry better.

CO 2: Analyse the historical underpinnings of poetry by contextualising poetry into different periods in History.

CO 3: Compare and contrast various categories of writing poetry with the intention of recognising the structural differences in them.

**SEMESTER 4**

**Course Title- Modes of Fiction**
**Course Code- EN4CR05**
CO 1: Analyse different narrative modes of fiction.

CO 2: Examine fiction from all across the world.

CO 3: Juxtapose literary works with various moments in literary history.

CO4: Create pieces of short fiction for understanding the features specific to fiction.

**Course Title- Language and Linguistics**
**Course Code- EN4CR06**
CO 1: Explain advanced British English pronunciation for academic or career advancement.

CO 2: Analyse pronunciations of English with regional variations in terms of dialectical differences.

CO 3: Compare and contrast various theories concerning the development of the syntax of the English language in order to facilitate a deeper understanding of the English language.

CO 4: Locate theoretical advancements in Linguistics to definite periods to recognise the trajectory of the development of various grammatical functions.

**SEMESTER 5**

**Course Title- Acts on the stage**
**Course Code- EN5CR07**
CO 1: Create a platform for the performance of drama.

CO 2: Analyse major playwrights and their works.

CO 3: Locate drama as a major part of the literary oeuvre.

CO 4: Design dramas for the stage and explain what goes into the making of a theatre.

**Course Title- Literary Criticism and Theory**
**Course Code- EN5CR08**
CO 1: Explain various developments in the field of Literary Criticism and Theory.

CO 2: Analyse the nuances of literary theory with the purpose of critiquing a work of literature.

CO 3: Examine the Indian Schools of Literary Criticism.

CO 4: Examine contemporary developments in the field of literary theory and criticism.

**Course Title- Indian Writing in English**
**Course Code- EN5CR09**
CO 1: Inspect the position of Indian Languages in the world literatures.

CO 2: Analyse the concerns of identity formulation through the literary works of diasporic writers.

CO 3: Examine some of the classics in Indian English literature across the genres.

CO 4: Investigate the possibilities of cross-cultural literary exchanges in order to understand the recognition of Indian culture by a non-native audience.

**Course Title- Environmental Science and Human Rights**
**Course Code- EN5CREN01**
CO 1: Create participation towards the implementation of Sustainable Development Goals as envisaged by the United Nations.

CO 2: Explain the ethical concerns based on Human Rights violation by having a proper understanding of their rights offered in the national and international forums.

CO 3: Analyse the role of literature in the protection of environment and promotion of human rights through the analysis of various literary works.

CO 4: Investigate several Environment and Human Rights movements across India.

**SEMESTER 6**

**Course Title- Postcolonial Literatures**
**Course Code- EN6CR10**
CO 1: Explain history of colonialism and its socio-economic-psychological implications on those subjected to foreign rule through select works.

CO 2: Analyse the language of postcolonial literatures.

CO 3: Explain the phenomenon of neo-colonialism as the new signpost in the history of post colonialism.

**Course Title- Women Writing**
**Course Code- EN6CR11**

CO 1: Investigate the major landmarks in the feminist movement.

CO 2: Analyse the cinematic adaptations of the literary works to have a visual account of the phenomenon of feminism.

CO 3: Discuss the politics of power ensconced in anti-feminist discourse.

CO 4: Inspect contemporary movements associated with gender studies such as the "Me-Too Movement."

**Course Title- American Literature**
**Course Code- EN6CR12**

CO 1: Investigate the factors that shaped America including the migration and the world wars.

CO 2: Inspect the myriad identities from different corners of the world that has come together to complete the nation that is America.

CO 3: Analyse major authors in American literature.

**Course Title- Modern World Literature**
**Course Code- EN6CR13**

CO 1: Explain the notions of canon by ransacking literatures from various identities and cultures.

CO 2: Analyse the ideas of central and the peripheral literatures.

CO 3: Discuss the major authors and works from various corners of the world.

# BSc Chemistry (Model I)

**(CBCS-Under Graduate Degree Programme, 2017 admission onwards, MG University)**

## PROGRAM SPECIFIC OUTCOMES (PSOs)

After the successful completion of the programme the learners shall be able to

**PSO1**: Comprehend the fundamental concepts in Chemistry

**PSO2**: Develop aptitude in the learning of emerging and advanced areas of Chemistry.

**PSO3**: Acquire skills in the proper handling of apparatus, chemicals and develop analytical skills in Chemistry.

**PSO4**: Master skills in critical thinking and scientific reasoning.

**PSO5**: Analyse the impact of chemistry in the society and environment.

## COURSE OUTCOME (CO)

### Semester I

### CH1CRT01: General and Analytical Chemistry

After the successful completion of the course, the learners shall be able to;

1. Describe the methodology and perspectives of Science and the importance of Science in the development of culture.
2. Do self-directed experimentation work and research in chemistry under the guidance and supervision of a mentor.
3. Explain various atomic properties of elements and learn the arrangement of elements in the periodic table
4. Analyse experimental parts of the theory and evaluate the analytical data.

### Semester II

### CH2CRT02: Theoretical and Inorganic Chemistry

After the successful completion of the course, the learners shall be able to;

1. Describe the various theories of chemical bonding with examples.
2. Explain various atomic models and the structure of atom.
3. Compare the properties of s,p,d and f block elements.
4. Predict the magnetic behaviour of various molecules based on Molecular orbital theory.

### CHCRP01: Volumetric Analysis

After the successful completion of the course, the learners shall be able to

1. Analyse quantitatively various compounds using Acidimetry and Alkalimetry.
2. Analyse quantitatively various compounds using Complexometry.
3. Analyse quantitatively various compounds using Permanganometry dichrometry
4. Analyse quantitatively various compounds using Iodimetry and iodometry.

### Semester III

### CH3CRT03: Organic Chemistry-I

After the successful completion of the course, the learners shall be able to;

1. Predict the structure and stability of various reaction intermediates in organic reactions and compare various electronic displacements

2. Differentiate the optical and geometric isomers of various organic compounds
3. Predict the aromaticity of an organic compound
4. Discuss the preparation, reactions, and properties of alkanes, halo alkanes, aromatic hydrocarbons and aryl halides.

**Semester IV**

**CH4CRT04: Organic Chemistry-II**

After the successful completion of the course, the learners shall be able to;

1. Describe the preparation, reactions, and properties of alcohols, phenols, ethers and epoxides,
2. Describe the preparation, reactions, and properties of carbonyl compounds, carboxylic acids, aromatic sulfonic acids and their derivatives.
3. Explain the reaction mechanisms of various name reactions.
4. Relate various name reactions in organic chemistry.

**CH4CRP02: Qualitative Organic Analysis**

After the successful completion of the course, the learners shall be able to;

1. Analyse systematically different functional groups.
2. Determine Melting point of various compounds.
3. Determine Boiling point of various compounds.
4. Prepare derivatives of various of organic compounds.

**Semester V**

**CH5CRT05: Environmental studies and Human Rights**

After the successful completion of the course, the learners shall be able to;

1. Describe the status of current environmental issues.
2. Explain the basic rights of an individual living in a society.
3. Outline the preventive measures for pollutants.
4. Justify the ambient soil conditions for the growth of crops.
5. Conserve energy and explore new renewable energy sources.
6. Control pollution in air, water and soil.

**CH5CRT06: Organic Chemistry-III**

After the successful completion of the course, the learners shall be able to;

1. Discuss the preparation and reactions of nitrogen compounds
2. Describe the preparation and properties of heterocyclic compound
3. Describe the classification and chemical properties of polymers and carbohydrates.
4. Explain synthesis, classification and applications of dyes

**CH5CRT07: Physical Chemistry-I**

At the end of the course, the learners shall be able to:

1. Outline the structure, properties and defects in different types of solids
2. Explain the theory of real gases
3. Outline different adsorption isotherms and electrical properties of molecules
4. Illustrate the theories, models and properties of liquid state.

**CH5CRT08: Physical Chemistry-II**

The course shall make the students to:

1. Examine the chemical aspects of quantum mechanics
2. Solve Schrodinger equation.
3. Explain the interaction of various components of EM radiation with matter.
4. Calculate the rotational and vibrational energy levels and internuclear distance
5. Explain the interaction of UV/Vis radiation with molecules.
6. Predict the NMR/ESR spectra of simple molecules/and radicals.

**CH5OPT01: OPEN COURSE- Chemistry in everyday life.**

After the successful completion of the course, the learners shall be able to;

1. Explain the effects of food additives
2. Understand the effects of cosmetics on the body
3. Understand principle of water purification
4. Learn the fundamentals of nanomaterials

**Semester VI**

**CH6CRT09: Inorganic Chemistry**

After the successful completion of the course, the learners shall be able to;

1. Distinguish the crystal field splitting pattern in coordination compounds.
2. Describe the structure and bonding in selected organometallic compounds.
3. Assign structure to metal carbonyls based on the electron counting scheme.
4. Explain various applications of bio-inorganic compounds

**CH6CRP03: Qualitative Inorganic Analysis**

After the successful completion of the course, the learners shall be able to;

1. Analyse systematically the cations present in a mixture
2. Analyse systematically the anions present in mixture
3. Explain the principle involved in inorganic analysis
4. Compare the solubility product values of various ions.

**CH6CRT10: Organic Chemistry-IV**

After the successful completion of the course, the learners shall be able to;

1. Describe structure and functions of different natural products like carbohydrates and amino acids.
2. Describe structure and functions of different natural products like proteins, vitamins, lipids, steroids and nucleic acids
3. Compare the biological functions of different natural products.
4. Explain the basic concepts of supramolecular chemistry

**CH6CRP04: Organic Preparation and Laboratory Techniques**.

After the successful completion of the course, the learners shall be able to;

1. To separate two compounds by TLC.
2. To separate two compounds by distillation and solvent extraction
3. To purify compounds by crystallisation
4. To prepare different derivatives of different organic compounds

**CH6CRT11: Physical Chemistry-III**

After the successful completion of the course, the learners shall be able to;

1. Analyse the laws of thermodynamics.
2. Demonstrate the application of chemical equilibrium.
3. Explain various concepts in phase equilibria.
4. Discuss the kinetics of reaction.

**CH6CRP05: Physical Chemistry Practical**

After the successful completion of the course, the learners shall be able to;

1. To determine transition temperature of salt hydrates.
2. To find out the CST of phenol water system
3. To determine equivalence point by conductometric and potentiometric titrations
4. To determine MW of compounds by Rast's method.
5. To determine viscometrically the percentage composition of mixture.

**CH6CRT12: Physical Chemistry-IV**

After the successful completion of the course, the learners shall be able to;

1. Define binary liquid mixture, azeotrope, CST and Colligative properties
2. Explain the applications of conductance measurements
3. Find out the symmetry elements and point group of small molecules
4. Summarize the basics of photochemistry

**CH6CRP06: Physical Chemistry Practicals**

After the successful completion of the course, the learners shall be able to;

1. Estimate compounds gravimetrically.
2. Explain the principle of gravimetric analysis.
3. Analyse and explain the procedure in preparing, collecting, treating, and weighing a precipitate.
4. Explain procedures for the gravimetric estimation of various compounds

## CHOICE BASED COURSE

**CH6CBT03: Soil and Agricultural Chemistry**

After the successful completion of the course, the learners shall be able to**;**

1. Justify the ambient soil conditions for the growth of crops
2. Illustrate various plant nutrients and fertilizers
3. Differentiate between pesticides, fungicides and herbicides.
4. Explain the different type of soils present in Kerala.

# MATHEMATICS COMPLEMENTARY COURSES FOR BSC CHEMISTRY

**Semester 1**

**MM1CMT01- Partial Differentiation, Matrices, Trigonometry and Numerical Methods**

**CO1** Identify functions of different variables and acquire knowledge in partial differentiation.

**CO2** Find Solutions of Homogeneous and Non Homogeneous linear equations.

**CO3** Discuss about Cayley Hamilton Theorem and its Applications.

**CO4** Identify the hyperbolic and Circular functions and Summation of different types of series.

**CO5** Find solution of algebraic and transcendental equations using different methods.

**Semester2**

**MM2CMT01-Integral Calculus and Differential Equations**

**CO1** Assess the volume of solids using Cross Sections.

**CO2** Examine the length of an arc of a curve whose equation in parametric form.

**CO3** Illustrate the area and volume by applying the technique of double and triple integral.

**CO4** Solve first order linear differential equations.

**CO5** Explain the origin of first order Partial Differential Equations

**CO6** Solve linear Partial Differential Equation of First Order.

**Semester 3**

**MM3CMT01: VECTOR CALCULUS, ANALYTICGEOMETRY AND ABSTRACT ALGEBRA**

**CO1** Differentiate Vector Fields.

**CO2** Illustrate gradient vector fields and find potential functions.

**CO3** Assess the line integrals, surface area and surface integrals.

**CO4** Examine the path independence.

**Semester IV**

## MM4CMT01 : FOURIER SERIES, LAPLACE TRANSFORM ANDCOMPLEX ANALYSIS

**CO1** Describe the idea of periodic functions, trigonometric series

**CO2** Find Fourier series of functions of any period and of even and odd functions and half range expansions

**CO3** Examine the fundamental ideas about power series method of solving differential equations

**CO4** Explain the mathematical theory behind the famous equations used in Physics such as Legendre equation and Legendre Polynomials, Rodrigues' Formula, etc.

**CO5** Describe the concept of analytic functions, elementary complex functions and their properties

**CO6** Apply the theory and techniques of complex integration

# PHYSICS COMPLEMENTARY COURSES FOR

# BSC CHEMISTRY

**Semester-I**
**PH1CMT02: PROPERTIES OF MATTER AND THERMODYNAMICS**

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

**CO1** – **Define** states of matter.

**CO2 -** **Construct** an idea of properties of solids and **illustrate the** use of material with their properties.

**CO3** - **Develop** the following concepts and **solve** problems involving them
a. Hooke's Law and other stress-strain laws
b. Determination of rigidity modulus
c. Uniform and Non- uniform bending
d. I Section girder

**CO4** - **Construct** an idea of properties of liquids and **explain** different phenomena associated with it.

**CO5 -** **Explain** the motion of fluids by **developing understanding** of viscosity, Poiseuille's Law and Bernoulli's Equation.

**CO6 -** **Illustrate** the laws of thermodynamics, **understand** its implications and **Explain** cyclic processes and **apply** this to heat engines.

**Semester-II**
**PH2CMT02: MECHANICS AND SUPERCONDUCTIVITY**

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

**CO1** – **Discuss** the physical quantities of accelerated motion of objects.

**CO2 -** E***xplain*** *different terms associated with rotational mechanics and* ***obtain solutions*** *to physical problems of rotational mechanics.*

**CO3 -** **Assess** the moment of inertia of different structures using parallel and perpendicular axes theorem.

**CO4 -** **Explain** oscillatory motion and **design** and **classify** different oscillators.

**CO5 -** **Describe** the concept of wave motion and able to **construct** different models describing wave motion.

**CO6 -** **Explain** the basic superconductor parameters: critical temperature, critical current density, critical magnetic field. **Understand** the most important theories to explain superconductivity and **discuss** the applications of High temperature superconductors.

**Semester-III**
**PH3CMT02: MODERN PHYSICS AND MAGNETISM**

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

**CO1** – E***xplain*** *different atom models and its basic features.*

**CO2 -** **Describe** atomic nucleus and **classify** the nucleus according to their properties and salient features. **Explain** radioactivity and **discuss** different aspects of nuclear energy in nuclear reactors and radio carbon dating.

**CO3 -** **Identify** the main aspects of the historical development of quantum mechanics and **discuss** and **interpret** experiments that reveal the wave properties of matter

**CO4 -** **Explain** the central concepts and principles in quantum mechanics, such as the Schrödinger equation, the wave function and its statistical interpretation, the uncertainty principle, stationary and non-stationary states, time evolution of solutions.

**CO5** – **Describe** the properties of materials and **application** of semiconductor electronics. **Apply** the knowledge of semiconductors to **illustrate** the functioning of basic electronic devices.

**CO6** – **Describe** the properties of magnetic materials and **classify** it by its properties and **explain** Earths Magnetism and its elements.

**Semester-IV**
**PH4CMT02: OPTICS AND SOLID STATE PHYSICS**

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

**CO1** – **Discuss** the interference phenomenon and **explain** the significance of it by **illustrating** examples. **Resolving** numerical examples of interference in different context.

**CO2** - **List out** different types of diffraction and **categorise** various physical problems of diffraction.

**CO3** - **Explain** the concept of polarization and **describe** various theorems of it. **Design** and **illustrate** Polaroids and **find** the applications of it.

**CO4 -** **Explain** the working of laser and **compare** different types of lasers. **Predict** the applications of lasers. **Illustrate** the working of Optical Fiber by **designing** a working model of it.

**CO5 -** **Discuss** dielectric material and its properties.

**CO6 -** **Develop** an understanding crystal structure and crystallographic techniques.

**PRACTICAL**
**Semester I & II**
**Complementary Physics Practical 1: PH2CMP01**
On successful completion of the course, the students will be able to

**CO1** – Determine Volume of cylinder (solid and hollow), sphere, beaker and glass piece using Vernier Calipers, Screw gauge and Beam balance

**CO2 -** Determine of Radius of gyration and moment of inertia and acceleration due to gravity (g) using Symmetric Compound Pendulum

**CO3 -** Understand the surface tension and viscosity of fluid by different experimental techniques

**CO4 -** Find focal length of lens and optical constants of different media using liquid lens arrangement

**CO5 -** Analyse the expression for young's modulus by studying the bending behaviour of beams and cantilever

**CO6 -** Find moment of inertia of rotationally symmetric body (solid sphere OR cylinder OR disc) from their period of oscillation on a torsion axle

**Semester III & IV**
**Complementary Physics Practical 2: PH4CMP02**
On successful completion of the course, the students will be able to

**CO1** – Construct and demonstrate electrical connection for measurement of resistivity by Carey Foster's Bridge

**CO2 -** Examine the effect horizontal component of earth's magnetic field on magnetic materials

**CO3 -** Construct and Demonstrate logic gates and verify the results

**CO4 -** Find the dynamics of Asymmetric Compound Pendulum and to determine 'g' and moment of inertia.

**CO5 -** Determine focal length of lens and optical constants of different media.

**CO6 -** Find and analyse the interference patterns using air wedge and Newtons rings arrangement

# BSc Physics (Model I)

**(CBCS-Under Graduate Degree Programme, 2017 admission onwards, MG University)**

## PROGRAMME SPECIFIC OUTCOMES

**PSO1 –** Understand the basic concepts, theories and principles of various branches of Physics and realize the contributions of great physicists

**PSO2 –** Acquire skills to read, understand and interpret physical information – verbal, mathematical and graphical.

**PSO3 -** Obtain solutions to physical questions by use of qualitative and quantitative reasoning

and by experimental investigation.

**PSO4 -** Develop experimental, observation, computational, mathematical and data analysis skills of students through a wide range of experiments and practical at laboratories.

**PSO5-** Create positive attitude towards the environment, ecosystem and energy conservation and develop awareness of how human rights can be translated into social and political reality

**PSO6 -** Provide opportunities to find links across different areas of knowledge, develop and evaluate ideas and information related to the project work and give an exposure to practical working environment and industrial practices.

## COURSE OUTCOMES

### CORE COURSES

**Semester-I**

### PH1CRT01: METHODOLOGY AND PERSPECTIVES OF PHYSICS

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

**CO1** – **Construct** the insight of the Development of physics in the last century and **list out** the contributions of great scientists.

**CO2 -** **Compare and contrast** the Contributions of Indian physicists.

**CO3** - **Identify** basic concepts, theories and principles and its applications of physics in everyday life.

**CO4** - ***Use*** the operations with basic number systems and **identify** its applications in digital electronics.

**CO5 -** **Construct** the idea of application of vectors in physics and **illustrate** it with examples.

**CO6 -** **Examine and describe** Experimental methods and error analysis.

**Semester-II**

### PH2CRT02: MECHANICS AND PROPERTIES OF MATTER

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

**CO1** **Describe** the concept of wave motion and able to **construct** different models describing wave motion.

**CO2** A**nalyse** different phenomena associated with wave motion.

**CO3** **Explain** oscillatory motion and **design** and **classify** different oscillators.

**CO4** E***xplain*** *different terms associated with rotational mechanics and* ***obtain solutions*** *to physical problems of rotational mechanics.*

**CO5 -** **Construct** an idea of properties of solids and **illustrate** use of material with their properties.

**CO6 -** **Construct** an idea of properties of liquids and **explain** different phenomena associated with it.

**Semester-III**

**PH3CRT03: OPTICS, LASER AND FIBER OPTICS**

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

**CO1** **Discuss** the interference phenomenon and **explain** the significance of it by **illustrating** examples.

**CO2** **Resolving** numerical examples of interference in different context.

**CO3** **List out** different types of diffraction and **categorise** various physical problems of diffraction.

**CO4** **Explain** the concept of polarization and **describe** various theorems of it.

**CO5** **Design** and **illustrate** Polaroids and **find** the applications of it.

**CO6** **Explain** the working of laser and **compare** different types of lasers. **Predict** the applications of lasers including working of optical fiber.

**Semester-IV**
**PH4CRT04: SEMICONDUCTOR PHYSICS**

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

**CO1** **Describe** the properties of materials and **application** of semiconductor electronics

**CO2** **Apply** the knowledge of semiconductors to **illustrate** the functioning of basic electronic devices.

**CO3** **Demonstrate** the switching and amplification application of the semiconductor devices.

**CO4** **Demonstrate** the control applications using semiconductor devices.

**CO5** **Identify** the fabrication methods of integrated circuits.

**CO6** **Classify** and **describe** the semiconductor devices for special applications.

**SEMESTER V**

**PH5CRT05: ELECTRICITY AND ELECTRODYNAMICS**

**CO1** Discuss the theory of moving coil ballistic galvanometer.

**CO2** Discuss variation of alternating current with time and define basic parameters and determine mean value and rms values of ac.

**CO3** Analyse LCR series circuits and LCR parallel resonant circuit

**CO4** Illustrate Superposition, Reciprocity, Thevenin's, Norton's & Maximum power transfer theorems and describe Maxwell's equations in different media.

**CO5** Explain Seebeck effect , Laws of thermo emf ,Peltier effect and Thomson effect

**CO6** Apply Gauss's law in different cases: solid sphere, infinite wire, infinite plane sheet and Discuss the Propagation of electromagnetic waves in different media.

**PH5CRT06: CLASSICAL AND QUANTUM MECHANICS**

**CO1** Describe principle of virtual work and D'Alembert's principle

**CO2** Solve Linear Harmonic oscillator, Planetary motion and Simple Pendulum problems using Lagrange's equation of motion

**CO3** Illustrate Calculus of variations to find out Euler Lagrange's equations for shortest

distance between two points, Brachistochrone problem

**CO4** Identify the limitations of classical mechanics and find the need of quantum mechanics

**CO5** Explain the time dependant Schrodinger equation for wave function and examine the Harmonic Oscillator problem in the perspective of quantum mechanics

**CO6** Discuss the historical development and origin of quantum theory and state the postulates of quantum mechanics

**PH5CRT07: DIGITAL ELECTRONICS AND PROGRAMMING**

**CO1** Compare Digital and analog systems, compare operators, logic symbols and truth tables of different logic gates.

**CO2** Summarize combinational and sequential logic systems

**CO3** Use Sum of product method, product of sum method for reducing Boolean expressions and solve Boolean functions using Karnaugh map.

**CO4** Compare and contrast encoders, decoders, multiplexers and demultiplexers.

**CO5** Illustrate and classify Flip-flops, Registers and Counters.

**CO6** Construct C++ programs using loops

**PH5CRT08: ENVIRONMENTAL PHYSICS AND HUMAN RIGHTS**

**CO1** Explain the Causes, effects and control measures of environmental pollution

**CO2** Discuss environmental ethics and various environment protection acts such as air act, water act, wildlife protection act and forest conservation act

**CO3** Categorize renewable and non-renewable energy sources

**CO4** Classify solar heat energy convertors such as solar cooker, solar still, solar dryer, solar pond and Summarize the need and characteristics of solar photovoltaic (PV) systems

**CO5** Classify three Generations of Human Rights (Civil and Political Rights; Economic, Social and Cultural Rights) and Discuss fundamental human rights in Indian Constitution

**CO6** Identify the relationship between Conservation of natural resources and human rights

**Open Course**

**PH5OPT02 - Physics in Daily Life**

**CO1** Recall Fundamental and derived quantities, Units and dimensions

**CO2** Distinguish between Fundamental phenomenon of light such as reflection, refraction, diffraction, interference and scattering

**CO3** Apply the knowledge of lens in correcting defects of the eye – myopia, hypermetropia, presbyopia and astigmatism

**CO4** Develop the basic idea of Voltage and current, ohms law, Electric energy, electric power and calculation of energy

**CO5** Discuss different phases of matter and different forms of energy

**CO6** Develop idea of Universe - Planets, solar system, lunar and solar eclipses, constellations, different types of stars, Galaxies, black hole, Satellites, Artificial satellites

**Semester-VI**

**PH6CRT09: THERMAL AND STATISTICAL PHYSICS**

**CO1** Apply first law of Thermodynamics to isochoric process, isobaric process and adiabatic process.

**CO2** Describe the parts of heat engines and apply Second law to explain the working of Carnot Refrigerator

**CO3** Understand the concept of entropy and change in entropy.

**CO4** Establish the relation of thermodynamic potentials with their variables.

**CO5** Understand the temperature dependence of black body radiation.

**CO6** Discuss the need for quantum statistics to derive Bose – Einstein and Fermi – Dirac distribution laws and find application of B- E and F- D statistics.

**PH6CRT10: RELATIVITY AND SPECTROSCOPY**

**CO1** Extend the Lorentz transformation to concepts of Length contraction, time dilation and relativistic Mass.

**CO2** Outline the introductory concepts of general theory of relativity.

**CO3** Describe Vector Atom model and discuss Zeeman Effect

**CO4** Summarize the principle of Nuclear magnetic Resonance (NMR) and of Electron spin resonance (ESR)

**CO5** Examine the Rotational and Vibrational Spectra of diatomic molecules

**CO6** Compare and explain IR, Microwave and Raman Scattering spectroscopes

**PH6CRT11: NUCLEAR, PARTICLE PHYSICS AND ASTROPHYSICS**

**CO1** Illustrate General properties of nucleus and classify Models of Nuclear structure

**CO2** Compare and explain Nuclear Radiation Detectors, Counters and Particle Accelerators

**CO3** Describe Gamow's theory of α decay and explain the working of Nuclear fission and Nuclear fusion reactors

**CO4** Classify elementary particles and instantiate the quark model of elementary particles

**CO5** Distinguish Latitude effect, Azimuth effect and Altitude effect of cosmic rays

**CO6** Illustrate stellar evolution and classify different types of stars

**PH6CRT12: SOLID STATE PHYSICS**

**CO1** Define the fundamental terms needed to study the structure of a crystal and distinguish the different crystal structures with examples.

**CO2** Discuss the classical and quantum theories of free electron model.

**CO3** Discuss band theory qualitatively using Kronig – Penney model.

**CO4** Explain the phenomenon of superconductivity and discuss the fundamental properties of superconductors.

**CO5** Define Josephson effect and discuss how it is used in SQUIDs.

**CO6** Explain BCS theory of superconductivity qualitatively.

## Choice Based Course

### PH6CBT03: COMPUTATIONAL PHYSICS

**CO1** Solve Nonlinear Equations by Bisection, Newton Raphson, Regula-Falsi, Secant and Fixed point iteration methods

**CO2** Solve system of linear algebraic equations by Gauss elimination method, Gauss-Jordan method Factorization and Iterative methods

**CO3** Apply Regression and interpolation methods in Curve fitting

**CO4** Explain trapezoidal rule and Simpson's 1/3 and 1/8 rule for numerical integration

**CO5** Explain Euler's method and first and second order Runge-Kutta method to find the numerical solution of differential equation

**CO6** Compose and write algorithms of various computational problems

## Physics Core Practical

**SEMESTER I & II (First Year)**
**Core Practical 1: PH2CRP01 – Mechanics and Properties of Matter**
**On successful completion of the course, the students will be able to**

**CO1** Determine viscosity of a liquid by Variable and constant pressure head methods

**CO2** Determine the surface tension and viscosity of fluid by different experimental techniques

**CO3** Verify the expression for young's modulus by analysing bending behaviour beams

**CO4** Apply the knowledge of dynamics of different types of pendulum to determine 'g'.

**CO5-** Verify and illustrate the concept of moment of inertia and its significance.

**CO6** Determine the elastic behaviour and working of torsional pendulum.

**SEMESTER III & IV (Second Year)**
**Core Practical 02: PH4CRP02 –Optics and Semiconductor Physics**
**On successful completion of the course, the students will be able to**

**CO1** – Determine refractive index of material of the prism and liquid by using spectrometer

**CO2** Distinguish between P-N junction diode and Zener diode.

**CO3** Demonstrate voltage regulation using Zener diode

**CO4** Determine focal length of lens and optical constants of different media.

**CO5** Illustrate the theory and experiment of interference using air wedge and newtons rings

**CO6** Construct half wave, full wave and bridge rectifiers

**SEMESTER V & VI**
**Core Practical :03**

**PH6CRP03 – Electricity, Magnetism and LASER**

**CO1** Measure resistance of wire, convert galvanometer into voltmeter and ammeter and Calibrate ammeter, low range and high range voltmeter using Potentiometer

**CO2** Find m and Bh and sketch magnetic flux variation using field along the axis of a circular coil

**CO3** Find magnetic moment of a bar magnet using Searle's vibration magnetometer

**CO4** Determine wavelength of Laser using Grating and determine slit width by Single slit diffraction using laser

**CO5** Measure resistivity of wire using Carey Foster's bridge.

**CO6** Verify Thevenin's and Norton's theorems

**Core Practical :04**

**PH6CRP04 – Digital Electronics**

**CO1** Realize logic gates – AND, OR and NOT – Using diodes, transistors etc. and using universal gates

**CO2** Verification of truth table of NAND, NOR, XOR and XNOR gates and verify De Morgan's theorems – using IC 7400

**CO3** Construct and verify A/D converter using IC 741 and BCD to 7 segment decoder

**CO4** Realize Half adder using gates and verify its truth table

**CO5** Construct Astable and Monostable Multivibrator using Transistor and IC 555

**CO6** Construct SR and JK Flip Flops using IC 7400 & 7410 and verify truth table

**Core Practical :05**

**PH6CRP05 – Thermal Physics, Spectroscopy and C++ Programming**

**CO1** Use Thermistor and Carey Foster's bridge to find Temperature coefficient of resistance

**CO2** Write and execute Computer programming in C++ to generate Fibonacci series and to convert a decimal number into binary number

**CO3** Write and execute Computer programming in C++ to Solve a quadratic equation and for sorting the numbers in ascending and descending order

**CO4** Calculate 'g' from experimental data of Simple Pendulum using Computer programming in C++

**CO5** Write and execute Computer programming in C++ to Convert temperature scale

**CO6** Find Dispersive power and Resolving power of grating and prism using Spectrometer and find Cauchy's constants

**Core Practical :06**

**PH6CRP06 – Acoustics, Photonics and Advanced Semiconductor Physics**

**CO1** Use Sonometer to Determine frequency of AC

**CO2** Determine frequency of given tuning fork, unknown mass and verification of laws of strings using sonometer and Melde's string

**CO3** Measure and draw V- I characteristics of solar cell and different colours of LED

**CO4** Construct and study Weinbridge Oscillator using IC 741 and Pulse Width Modulator using IC 555

**CO5** Construct Regulated power supply using Zener diode and IC 741 and study line and load regulations

**CO6** Construct and study Voltage multipliers – Doubler & Tripler

**PH6PRO01 – Project and Industrial Visit**

**CO1** Identify the need of lifelong learning and adapt to changing needs of profession and society and get updated with current state-of-art

**CO2** Express ideas clearly and effectively, both verbally and in written form.

**CO3** Find links across different areas of knowledge and generate, develop and evaluate ideas and information related to the project.

**CO4** Develops ability to work with peers, building teamwork and group skills.

**CO5** Inspect and realize practical working environment and industrial practices.

# MATHEMATICS COMPLEMENTARY COURSES FOR BSC PHYSICS

**Semester 1**

**MM1CMT01- Partial Differentiation, Matrices, Trigonometry and Numerical Methods**

**CO1** Identify functions of different variables and acquire knowledge in partial differentiation.

**CO2** Find Solutions of Homogeneous and Non Homogeneous linear equations.

**CO3** Discuss about Cayley Hamilton Theorem and its Applications.

**CO4** Identify the hyperbolic and Circular functions and Summation of different types of series.

**CO5** Find solution of algebraic and transcendental equations using different methods.

**Semester2**

**MM2CMT01-Integral Calculus and Differential Equations**

**CO1** Assess the volume of solids using Cross Sections.

**CO2** Examine the length of an arc of a curve whose equation in parametric form.

**CO3** Illustrate the area and volume by applying the technique of double and triple integral.

**CO4** Solve first order linear differential equations.

**CO5** Explain the origin of first order Partial Differential Equations

**CO6** Solve linear Partial Differential Equation of First Order.

**Semester 3**

**MM3CMT01:VECTOR CALCULUS, ANALYTICGEOMETRY AND ABSTRACT ALGEBRA**

**CO1** Differentiate Vector Fields.

**CO2** Illustrate gradient vector fields and find potential functions.

**CO3** Assess the line integrals, surface area and surface integrals.

**CO4** Examine the path independence.

**Semester IV**

## MM4CMT01 : FOURIER SERIES, LAPLACE TRANSFORM ANDCOMPLEX ANALYSIS

**CO1** Describe the idea of periodic functions, trigonometric series

**CO2** Find Fourier series of functions of any period and of even and odd functions and half range expansions

**CO3** Examine the fundamental ideas about power series method of solving differential equations

**CO4** Explain the mathematical theory behind the famous equations used in Physics such as Legendre equation and Legendre Polynomials, Rodrigues' Formula, etc.

**CO5** Describe the concept of analytic functions, elementary complex functions and their properties

**CO6** Apply the theory and techniques of complex integration

# CHEMISTRY COMPLEMENTARY COURSES FOR BSC PHYSICS

**Semester I**

**CH1CMT01: Basic Theoretical and Analytical Chemistry**

After the successful completion of the course, the learners shall be able to;

1. Describe atomic structure and bonding
2. Explain fundamental concepts in chemistry
3. Explain principles of analytical methods
4. Compare the different chromatographic methods used in analytical chemistry

**Semester II**

**CH2CMT02: Basic Organic Chemistry**

After the successful completion of the course, the learners shall be able to;

1. Draw the optical and geometric isomers of various organic compounds
2. Predct the structure and stability of various reaction intermediates.
3. Explain various electronic displacements and type of organic reactions:
4. Explain the synthesis and properties of natural and synthetic polymers

**CH2CMP01: Volumetric Analysis (Practicals)**

After the successful completion of the course, the learners shall be able to;

1. Quantitative analyse various compounds using acidimetry and alkalimetry.
2. Quantitative analyse various compounds using permanganometry
3. Quantitative analyse various compounds using dichrometry.
4. Quantitative analyse various compounds using iodometry.

**Semester III**

**CH3CMT03: Physical Chemistry-I**

After the successful completion of the course, the learners shall be able to;

1. Differentiate the properties of solid, liquid and gas
2. Explain the properties of surface chemistry and colloids
3. Explain properties related to phase equilibria
4. Differentiate defects in solids

**Semester IV**

**CH4CMT05: Physical Chemistry-II**

After the successful completion of the course, the learners shall be able to;

1. Assess the IR and UV –Vis spectrum of organic molecules
2. Explain the applications of conductance measurements
3. Explain the synthesis of nanomaterial
4. Discuss the kinetics of reactions

**CH4CMP02: Physical Chemistry (Practicals)**

After the successful completion of the course, the learners shall be able **;**

1. To determine transition temperature of salt hydrates
2. To find out the CST of phenol water system
3. To determine equivalence point by conductometric and potentiometric titrations
4. To determine MW of compounds by Rast's method

# BSc Zoology (Model II - Aquaculture)

**(CBCS-Under Graduate Degree Programme, 2017 admission onwards, MG University)**

## PROGRAMME SPECIFIC OUTCOME (PSO)

A student is expected to attain the following outcome after successful completion of this programme

1. ***Develop*** aptitude for learning the Science of Nature and its Life Processes by acquiring the theoretical ***knowledge*** and practical experience of Zoology and its allied branches.
2. Extend his/her ***support*** for the conservation of biosphere and natural resources and also for the sustainable development to maintain a natural balance in Local, National & World level.
3. Master basic skills for ***using*** ICT and biological instrument to become a competent person in the ever-growing field of Biology.
4. ***Apply*** the principles of modern branches of Zoology for keeping good standard in life/health (Individual and Community life/health).
5. ***Identify problems as scientific or not***, adopt standard methodology to synthesize solution to the problem (within the broad discipline of Zoology).
6. ***Design*** self-employment in certain applied branches of Zoology (such as aquaculture, apiculture, vermiculture, quail farming etc.) and also to pursue higher studies and research in Zoology or its allied branches.

## COURSE OUTCOME (CO)

# ZOOLOGY

**SEMESTER - 1**

### ZY1CRT01: GENERAL PERSPECTIVES IN SCIENCE & PROTISTAN DIVERSITY

1.1. Create curiosity to learn the philosophy of Science, its concepts and scope.

1.2. Develop scientific attitude and perspectives

1.3. Able to classify different levels of biological diversity through the systematics.

1.4. Get an outline on protistan diversity and parasitic forms of lower invertebrates.

**SEMESTER- 2**

### ZY2CRT02: ANIMAL DIVERSITY- NON CHORDATA

2.1. Create curiosity in learning the Non-Chordate diversity of life.

2.2. Compare and contrast the diversity of life and their biological importance.

2.3. Discuss the evolutionary significance of invertebrate fauna.

2.4. Describe various non-chordate phyla based on their general characters and classification.

**SEMESTER-3**

### ZY3CRT03: ANIMAL DIVERSITY- CHORDATA

3.1.Develop interest to learn about the classification, diversity and systematic position of chordates.

3.2.Discuss about the fish diversity and their structural modifications to lead aquatic life.

3.3. Identify the morphological and anatomical organization of frog, rabbit etc.

3.4. Examine the economic importance of some chordate classes and adaptations of selected vertebrates such as birds, aquatic mammals etc.

**SEMESTER -4**

**ZY4CRT04: RESEARCH METHODOLOGY, BIOPHYSICS AND BIOSTATISTICS**

4.1 Develop aptitude for natural inquiry about biological phenomena in a scientific way

4.2 Discuss on various research designs and different steps involved in writing a project proposal.

4.3 Describe on how to make a research communication?

4.4 Use statistical methods in biological studies.

4.5 Acquire skills for the effective use of different types of biological techniques.

**SEMESTER -5**

**ZY5CRT05: ENVIRONMENTAL BIOLOGY AND HUMAN RIGHTS**

5.1 Identify various environmental issues and their conservation strategies.

5.2 Discuss about natural resources, their protection, conservation, factors polluting the environment, their impacts and control measures.

5.3 Describe on toxicology, its impact on human health and remedial measures

5.4 Examine the concept of Human rights- & its manifestations.

**ZY5CRT06: CELL BIOLOGY AND GENETICS**

6.1 Examine the phenomenon of life on a Cellular perspective.

6.2 Discuss on various biophysical mechanisms of a cell

6.3 Examine the role of genes for the transmission of characters from parent to offspring.

6.4 Identify various human genetic disorders and how they affect the well-being of an individual?

**ZY5CRT07: EVOLUTION, ETHOLOGY AND ZOOGEOGRAPHY**

7.1 Discuss about the evolutionary history of earth - living and nonliving evolutionary concepts and theories.

7.2 Describe about the distribution of animals on earth, its pattern, evolution and causative factors.

7.3 Compare and contrast various animal behavior.

7.4 Identify the mechanism and factors affecting evolution.

**ZY5CRT08: HUMAN PHYSIOLOGY, BIOCHEMISTRY AND ENDOCRINOLOGY**

8.1 Examine the biochemistry of common food substances, their structure, function and metabolism.

8.2 Discuss on the structure and function of various organs and organ systems of man.

8.3 Examine the need for balanced diet, mental health and exercise.

8.4 Get an outline on the role of hormones in regulating various physiological processes.

**ZY5OPT01: VOCATIONAL ZOOLOGY** (Apiculture, Vermiculture, & Ornamental Fish Culture)

ZY5OPT01.1 Get an outline about the economically important animals.

ZY5OPT01.2 Discuss on the process of aquarium management, vermicomposting and apiculture.

ZY5OPT01.3 Examine the resources available for ornamental fish culture, vermicomposting and apiculture.

ZY5OPT01.4 Acquire skill for waste management through vermiculture and organic farming.

**SEMESTER -6**

**ZY6CRT09: DEVELOPMENTAL BIOLOGY**

9.1 Discuss on how a single celled zygote forms multicellular organism?

9.2 Describe on the environmental influences on the prenatal life.

9.3 Examine prenatal birth defects and diagnosis.

9.4 Explain the recent trends in stem cell research and its applications.

**ZY6CRT10: MICROBIOLOGY AND IMMUNOLOGY**

10.1 Discuss on the Methods in Microbiology: Sterilization and disinfection - physical and chemical methods.

10.2 Compare and contrast various types of Culture media, method of isolation of pure colony and culture preservation techniques etc.

10.3 Discuss on epidemiology, symptomology, diagnosis and treatment of Bacterial disease - tetanus, Viral disease – AIDS, fungal – candidiasis.

10.4 Explain on various types of vaccines and recent trends in vaccine preparation.

10.5 Discuss on the structure, types and functions of antibodies.

**ZY6CRT11: BIOTECHNOLOGY, BIOINFORMATICS AND MOLECULAR BIOLOGY**

11.1 Describe on recombinant DNA technology and its significance.

11.2 Discuss on various biological databases

11.3 Examine the flow of information from DNA to RNA and RNA to proteins.

11.4 Describe the structure of DNA and different types of RNA

**ZY6CRT12: OCCUPATIONAL ZOOLOGY** (Aquaculture, Apiculture, Vermiculture & Quail farming)

12.1 Create interest in the field of applied zoology as a means of self-employment.

12.2 Use the scientific knowledge on apiculture for self-employment.

12.3 Identify the scope of ornamental fish culture.

12.4 Compose waste management unit through the application of vermiculture.

12.5 Discuss about the methodology of Quail farming.

**ZY6CBT03: NUTRITION, HEALTH & LIFESTYLE MANAGEMENT**

ZY6CBT03.1 Describe the general concept of health and various parameters that define health and wellness.

ZY6CBT03.2 Compare various types of nutrients and their role in health.

ZY6CBT03.3 Explain on food safety, food laws & regulations.

ZY6CBT03.4 Discuss on how to attain good life style practices, physical fitness and healthy food habits?

# AQUACULTURE

## SEMESTER 1

### ZA1VO1U : PRINCIPLES AND METHODS IN AQUACULTURE

ZA1VO1U.1. Discuss on the scope and importance of aquaculture.

ZA1VO1U.2. Explain the concept of recycling organic waste for maximum aquatic production.

ZA1VO1U.3. Describe on how to construct and prepare a pond for fish culture?

ZA1VO1U.4. Classify various cultivable finfish and shell fish.

### ZA1VO2U: HATCHERY AND CULTURE TECHNIQUES

ZA1VO2U.1. Discuss on the culture practices of various indigenous edible and ornamental finfishes and edible shellfishes.

ZA1VO2U.2. Examine different technologies of seed production of common cultivable species.

ZA1VO2U.3. Describe on various live feeds available for aquatic organisms and understand their culture methods.

ZA1VO2U.4. Identify the techniques of culturing Crustaceans and Bivalve mollusks

## SEMESTER -2

### ZA2VO3U- CAPTURE FISHERY

ZA2VO3U.1. Describe on various types of craft and gears used in capture fishery.

ZA2VO3U.2. Discuss about the inland capture fishery resources and marine fishery resources of India

ZA2VO3U.3. Explain on how to manage and conserve fishery resources?

ZA2VO3U.4. Identify different types of commercially important marine shell fishes.

**ZA2VO4U: BIOLOGY OF FISHES**

ZA2VO4U.1. Discuss on the morphological and anatomical organization of finfishes and shellfishes.

ZA2VO4U.2. Describe the basic principles of Taxonomy of cultivable organisms.

ZA2VO4U.3. Examine the natural food of fishes and the pattern of growth

ZA2VO4U.4. Explain the reproductive biology of fishes

## SEMESTER-3

**ZA3VO5U-FISHERIES ENVIRONMENT**

ZA3VO5U.1. Examine the ecology of fresh water habitat and marine habitat.

ZA3VO5U.2. Identify the various instruments used in marine biological sampling.

ZA3VO5U.3. Describe on remote sensing techniques and satellite remote sensing of fish stocks.

ZA3VO5U.4. Identify the ecological indicator organisms.

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**ZA3VO6U- FISH NUTRITION**

ZA3VO6U.1. Discuss about the nutritional needs of aquatic organisms in culture.

ZA3VO6U.2. Explain the basic concept of energy budgeting, food additives and varieties of feed ingredients used in Aqua feeds.

ZA3VO6U.3. Relate the principles of feed formulation and equipment used in feed manufacture.

ZA3VO6U.4. Explain on various growth promoters that can be applied in fish feed

## SEMESTER-4

### ZA4VO7U: REPRODUCTIVE PHYSIOLOGY AND ENDOCRINOLOGY

ZA4VO7U.1. Discuss on variety of reproductive techniques in finfishes and shellfishes and the factors controlling reproduction.

ZA4VO7U.2. Explain the endocrine and neurosecretory system of finfishes and shellfishes.

ZA4VO7U.3. Describe the embryonic development of fishes

ZA4VO7U.4. Identify the techniques of induced breeding, and cryopreservation of fish gametes.

### ZA4VO8U: MICROBIOLOGY, PATHOLOGY AND POSTHARVEST TECHNOLOGY

ZA4VO8U.1. Describe on biochemical composition of fishes.

ZA4VO8U.2. Compare the characteristics of fresh fish and spoilage fish.

ZA4VO8U.3. Identify the various agencies involved in fish spoilage.

ZA4VO8U.4. Discuss on various methods used in fish processing and preservation.

ZA4VO8U.5. Identify various fish diseases and learns its remedial measures.

# CHEMISTRY COMPLEMENTARY COURSES FOR BSC ZOOLOGY

**Semester I**

**CH1CMT01: Basic Theoretical and Analytical Chemistry**

After the successful completion of the course, the learners shall be able to;

1. Describe atomic structure and bonding
2. Explain fundamental concepts in chemistry
3. Explain principles of analytical methods
4. Compare the different chromatographic methods used in analytical chemistry

**Semester II**

**CH2CMT02: Basic Organic Chemistry**

After the successful completion of the course, the learners shall be able to;

1. Draw the optical and geometric isomers of various organic compounds
2. Predct the structure and stability of various reaction intermediates.
3. Explain various electronic displacements and type of organic reactions:
4. Explain the synthesis and properties of natural and synthetic polymers

**CH2CMP01: Volumetric Analysis (Practicals)**

After the successful completion of the course, the learners shall be able to;

1. Quantitative analyse various compounds using acidimetry and alkalimetry.
2. Quantitative analyse various compounds using permanganometry
3. Quantitative analyse various compounds using dichrometry.
4. Quantitative analyse various compounds using iodometry.

**Semester III**

**CH3CMT04: Inorganic and Organic Chemistry**

After the successful completion of the course, the learners shall be able to;

1. Discuss the principle and applications of nuclear chemistry
2. Discuss the applications of bioinorganic chemistry
3. Explain the synthesis, properties and reaction of heterocyclic chemistry
4. Explain the chemistry of fertilizers, pesticides, drugs, food additives and cosmetics

**Semester IV**

**CH4CMT06: Advanced Bio-organic Chemistry**

After the successful completion of the course, the learners shall be able to;

1. Describe the chemistry, structure and functions of different natural products like terpenoids, alakaloids and carbohydrate.
2. Differentiate the functions of nucleic acids and enzymes
3. Explain the functions of amino acids and proteins.
4. Describe the structure and functions of vitamins, lipids and steroids

**CH4CMP03: Organic Chemistry (Practicals)**

After the successful completion of the course, the learners shall be able to;

1. Analyse systematically different functional groups.
2. Determine Melting point of various compounds.
3. Determine Boiling point of various compounds.
4. Prepare derivatives of various of organic compounds.

# BSc Mathematics (Model I)

## (CBCS-Under Graduate Degree Programme, 2017 admission onwards, MG University)

### Programme Specific Outcome (PSO)

After the completion of this programme the students will be able to

**PSO1**: Apply appropriate mathematical techniques in a multidisciplinary environment.

**PSO2**: Explain and discuss core areas of pure mathematics including geometry, algebra, mathematical analysis and discrete mathematics.

**PSO3**: Analyze and apply mathematical arguments in a logical and critical manner.

**PSO4**: Compare, relate and use quantitative models arising in social science, business and other contexts for further extension of their studies

**PSO5**: Categorize and examine advanced areas of mathematics and statistics, chosen by the student from the given courses for future research and societal applications

**PSO6**: Attain prominent career in industry, banks, offices and for further academic study.

## Course Outcomes (COs)

**Semester I**

**MM1CRT01 - FOUNDATION OF MATHEMATICS**

**CO 1 –** To describe fundamental ideas about sets and functions

**CO 2** – To construct truth tables and get an idea about Boolean algebra and logic gates in circuits

**CO 3** – Able to analyze statements using truth tables

**CO 4** – Able to construct simple proofs

**CO 5** – To identify mathematical symbols and explain standard methods of proofs

**CO 6** – Able to solve polynomial equations.

**Semester II**

**MM2CRT01 : ANALYTIC GEOMETRY, TRIGONOMETRY AND DIFFERENTIAL CALCULUS**

**CO 1 -** Discuss the concept of higher order derivatives and their applications. Parametric Equations of curves and their applications are introduced to the student.

**CO 2** - Compose higher order derivatives by applying Leibnitz Theorem.

**CO 3** - Apply L'Hospital's rule for computing limits of indeterminate forms.

**CO 4** - Acquire ability to apply the theorem in a correct mathematical way.

**CO 5** - Explain the concepts of Trigonometric functions, their properties and summation of trigonometric series.

**CO 6** – Categorize the standard equations of parabola, hyperbola, and ellipse.

**CO 7** – Explain the parametric forms of parabola, hyperbola, and ellipse

**Semester III**

**MM3CRT01 : CALCULUS**

**CO 1** - Find curvature and related parameters of a given curve.

**CO 2** - Find partial derivatives of functions of more than one variable.

**CO 3** - Examine how the ideas of maxima and minima can be used to solve practical problems

**CO 4** - Compose the area and volume of solids using definite integrals.

**CO 5 -** Examine the arc length of a given curve and area enclosed by curves.

**CO 6 -** Use of cylindrical and spherical co-ordinates in evaluating triple integrals.

**CO 7** – Apply triple integrals to finding volumes of solid objects.

**Semester IV**

**MM4CRT01 : VECTOR CALCULUS, THEORY OF NUMBERSAND LAPLACE TRANSFORM**

**CO 1 -** Apply vector calculus to real world problems.

**CO 2 -** Develop proficiency in the analysis of vector valued functions

**CO 2 -** Discuss the various properties of the gradient, the curl and divergence.

**CO 3** – Solve vector problems by applying Green's theorem, Divergence theorem and Stoke's theorem.

**CO 4 -**Discuss the Laplace transform of a given function.

**CO 5 -** Discuss the basic definitions and theorems in number theory.

**CO 6 -**Ability to apply number theory algorithms and procedures to basic problems.

**Semester V**

**MM5CRT01 : MATHEMATICAL ANALYSIS**

**CO1-** To discuss the concept of Algebraic and Completeness properties of real numbers.

**CO2-** To describe sequences and their limits and also about its convergence and divergence.

**CO3-** Explain Bolzano-Weierstrass Theorem , The Cauchy Criterion.

**CO4-** To discuss the basic ideas of series and absolute convergence.

**CO5-** To explain various tests for absolute and non-absolute convergence of series.

**CO6-** To discuss the Limit Concepts.

**MM5CRT02 : DIFFERENTIAL EQUATIONS**

**CO 1** – To identify various types of differential equations of first order and obtain its solution

**CO 2** – To find the complementary function and particular integrals of linear differential equation

**CO 3** – To illustrate the orthogonal trajectory of the system of curves on a given surface

**CO 4** – Describe the origin of partial differential equation and distinguish the integrals of first order linear partial differential equation into complete, general and singular integrals.

**CO 5** – To use the method of solution of Lagrange for solving the first order partial differential equation

**CO 6** – To categorize the fundamental ideas about the power series solution of equations in Physics such as Legendre's equation, Bessel's equation, Airy's equation, etc.

**MM5CRT03: ABSTRACT ALGEBRA**

**CO1** – Explain important mathematical concepts in abstract algebra such as definition of a group, order of a finite group and order of an element.

**CO2** – Identify and explain different types of subgroups such as normal subgroups, cyclic subgroups their structure and characteristics .

**CO3** – Explain many mathematical concepts studied in abstract mathematics such as permutation groups, factor groups and Abelian groups.

**CO4 -** Describe about major mathematicians or important contribution in the development of group theory

**CO5 -** Apply the results from group theory to study the properties of rings and fields and also to some advanced level of abstract algebra and its applications

**MM5CRTO4: HUMAN RIGHTS AND ENVIORNMENTAL MATHEMATICS**

**CO1 -** To investigate how and why things happen, and make their own decisions about complex environmental issues.

**CO2 -** To identify various problems with respect to the environment.

**CO3 -** To find the inter-relationship between man and environment for protecting the nature and natural resources and acquiring basic knowledge about environment.

**CO4 -** To create an idea of Indian Constitution, its Articles and about Human Rights.

**CO5 -** To Identify Fibonacci Numbers and Golden Ratio in nature.

**CO6 -** To examine g.c.d of numbers using Euclidean Algorithm and solving Linear Homogeneous Recurrence Relations With Constant Coefficients. (LHRRWCC).

**MM5GET02 : APPLICABLE MATHEMATICS (Open Course)**

**CO 1**- To examine the basic ideas of Mathematics such as quadratic equations, trigonometry, etc.

**CO2**- Able to write competitive examinations with confidence

**CO3** - To discuss mathematical concepts and problem solving skill.

**CO 4**- Apply short cut methods for solving problems.

**Semester VI**

**MM6CRT01 : REAL ANALYSIS**

**CO1**- To compare Continuity and Uniform Continuity.

**CO2**- To discuss the concept of Derivatives, L'Hospitals Rule.

**CO3** - Able to analyse Taylor's Theorem and Mean value Theorem.

**CO4** - To categorize the concepts of Reimann integration and related theorems.

**CO5** - To Identify the properties of pointwise convergence and absolute convergence of sequences.

**CO6** -To categorize the ideas of series of function.

**MM6CRT02: GRAPH THEORY AND METRIC SPACES**

**CO1**- Construct some important classes of graph theoretic problems

**CO2**- Explain the concept of trees in practical life applications such as current flow, linguistic grammar and apply some basic algorithms for graphs

**CO3** - Identify graph applications in day to day problems through graph Modeling and also the fundamental concepts in graph theory for further research needs.

**CO4**- Compare and examine various metric spaces evolved from its basic practical definition of usual distance in Euclidean plane

**CO5**- Will be able to investigate into topological properties of metric spaces which consequently sow a strong platform for further research

**MM6CRTO3 : LINEAR ALGEBRA**

**CO 1 –** Identify vectors in n-space which is useful in representing data.

**CO 2 -** Discuss linear system of equations using matrix as a tool.

**CO 3** - Examine the geometric ideas and the relationship of vector space theory and matrix theory.

**CO 4** - Explain eigen values and eigen vectors which are significant in dynamic problems.

**CO 5 -** Relate the concepts of linear transformation and matrix representation.

**CO 6 –**Able to find the null space, range space of linear transformations.

**MM6CRT04 : COMPLEX ANALYSIS**

**CO1** -To describe the basic concepts in complex analysis like modulus, amplitude, polar forms etc.

**CO2** -To examine important concept like analytic functions, entire functions, harmonic functions and elementary functions.

**CO3** -To compare and contrast between real functions and complex functions

**CO4** -To discuss about complex integration

**CO5** -To discuss with series representation of analytic function

**CO6** -Analyze the various applications of complex integration

**CO7** -To discuss about singular, poles and evaluation of complex integrals.

**MM6CBT01 : OPERATIONS RESEARCH**

**CO1** - To solve LPP using Graphical method, Simplex Method and Big-M Method.

**CO2 -** To form dual of an LPP and theorems of duality with proof.

**CO3 -** To solve transportation and assignment problem.

**CO4** – To find different solution methods of Games without saddle points.

## PHYSICS COMPLEMENTARY COURSES FOR

## BSC MATHEMATICS

**Semester-I**
**PH1CMT01: PROPERTIES OF MATTER AND ERROR ANALYSIS**

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

**CO1** **Define** states of matter.

**CO2** **Construct** an idea of properties of solids and **illustrate the** use of material with their properties.

**CO3** **Develop** the following concepts and **solve** problems involving them
a. Hooke's Law and other stress-strain laws
b. Determination of rigidity modulus
c. Uniform and Non- uniform bending
d. I Section girder

**CO4** **Construct** an idea of properties of liquids and **explain** different phenomena associated with it.

**CO5** **Study** the motion of fluids by **developing understanding** of viscosity, Poiseuille's Law and Bernoulli's Equation.

**CO6** **Examine and describe** Experimental methods and error analysis.

**Semester-II**
**PH2CMT01: MECHANICS AND ASTROPHYSICS**

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

**CO1** **Discuss** the physical quantities of accelerated motion of objects.

**CO2** E***xplain*** *different terms associated with rotational mechanics and* ***obtain solutions*** *to physical problems of rotational mechanics.*

**CO3** **Assess** the moment of inertia of different structures using parallel and perpendicular axes theorem.

**CO4** **Explain** oscillatory motion and **design** and **classify** different oscillators.

**CO5** **Describe** the concept of wave motion and able to **construct** different models describing wave motion.

**CO6** **Discuss** various theories of evolution of stars and **explain** various physical parameters that affecting the star.

**Semester-III**
**PH3CMT01: MODERN PHYSICS AND ELECTRONICS**

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

**CO1** ***Explain*** *different atom models and its basic features.*

**CO2** **Describe** atomic nucleus and **classify** the nucleus according to their properties and salient features. **Explain** radioactivity and **discuss** different aspects of nuclear energy in nuclear reactors and radio carbon dating.

**CO3** **Familiar** with the main aspects of the historical development of quantum mechanics and be able to **discuss** and **interpret** experiments that reveal the wave properties of matter

**CO4** **Understand** the central concepts and principles in quantum mechanics, such as the Schrödinger equation, the wave function and its statistical interpretation, the uncertainty principle, stationary and non-stationary states, time evolution of solutions.

**CO5** **Describe** the properties of materials and **application** of semiconductor electronics. **Apply** the knowledge of semiconductors to **illustrate** the functioning of basic electronic devices.

**C06** ***Use*** the operations with basic number systems and **identify** its applications in digital electronics.

**Semester-IV**
**PH4CMT01: OPTICS AND ELECTRICITY**

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

**CO1** **Discuss** the interference phenomenon and **explain** the significance of it by **illustrating** examples. **Resolving** numerical examples of interference in different context.

**CO2** **List out** different types of diffraction and **categorise** various physical problems of diffraction.

**CO3** **Explain** the concept of polarization and **describe** various theorems of it. **Design** and **illustrate** Polaroids and **find** the applications of it.

**CO4** **Explain** the working of laser and **compare** different types of lasers. **Predict** the applications of lasers. **Illustrate** the working of Optical Fiber by **designing** a working model of it.

**CO5** **Discuss** dielectric material and its properties.

**CO6** **Describe** transient current, its growth and decay and **analyse** working of various AC circuits in it.

# STATISTICS COMPLEMENTARY COURSES FOR BSC MATHEMATICS

**Semester 1**

**ST1CMT01 - Descriptive Statistics**

Upon successful completion of the course, a student will be able to

**CO1 -** Identify appropriate sampling and data collection processes

**CO2 -** Present data objectively using tables, diagrams and graphs

**CO3** – Calculate measures of central tendency and measures of dispersion in grouped and ungrouped data cases

**CO4** – Examine the significance of moments and kurtosis

**CO5** – Explain index numbers as a method to identify trends in data set

**Semester 2**

**ST2CMT02 - Probability Theory**

Upon successful completion of the course, a student will be able to

**CO1** – Compute the probability of events and use the basic probability rules, including additive and multiplicative laws

**CO2 -** Explain the concept of probability distribution and probability density functions

**CO3 -** Calculate probabilities, and derive the marginal and conditional distributions of bivariate random variables

**CO4** – Use correlation coefficient to describe the direction and strength of a liner relationship

**CO5** – Explain regression technique as a method to model pattern in the data and to make predictions

**Semester 3**

**ST3CMT03 – Probability Distributions**

Upon successful completion of the course, a student will be able to

**CO1** – Explain the concept of moments, MGF and characteristic function of random variables

**CO2** – Identify the type of statistical situation to which different standard distributions can be applied

**CO3 -** Use standard normal curve to calculate the area under normal curve

**CO4 -** Apply Tchebycheff `s inequality, Bernoulli`s law of large numbers, Weak law of large numbers and Central Limit Theorem to calculate probabilities

**CO5 -** Compare the different sampling distributions

**Semester 4**

**ST4CMT04 - Statistical Inference**

Upon successful completion of the course, a student will be able to

**CO1** – Use different estimation methods to find point and interval estimators

**CO2** – Discuss the properties of good estimators

**CO3 -** Define null hypothesis, alternative hypothesis, type 1 and type 2 error, level of significance and test statistic

**CO4** –Conduct statistical hypotheses testing to test for means, proportions and variance in one and two sample cases

**CO5** – Examine the association between the attributes and test goodness of fit using Chi-square test

# BSc PHYSICS (Model III - Electronic Equipment Maintenance)

**(CBCS-Under Graduate Degree Programme, 2017 admission onwards, MG University)**

## PROGRAMME SPECIFIC OUTCOMES (PSO)

**PSO1 –**Understand the basic concepts, theories and principles of various branches of Physics and realize the contributions of great physicists

**PSO2 -** Explain a broad spectrum of modern trends in physics and to develop experimental,

computational and mathematics skills of students.

**PSO3 -**Develop their experimental, observation and data analysis skills through a wide range of experiments through practical at laboratories.

**PSO4-**Create positive attitude towards the environment, ecosystem and energy conservation

**PSO5 -**Provide an exposure to practical working environment and industrial practices.

**PSO6 –** Provide opportunities to find links across different areas of knowledge and generate, develop and evaluate ideas and information related to the project.

## COURSE OUTCOMES (COs)

### Core Course 1 - Physics

**Semester-I**

**PH1CRT01: METHODOLOGY AND PERSPECTIVES OF PHYSICS**

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

**CO1** **Construct** the insight of the Development of physics in the last century and **list out** the contributions of great scientists.

**CO2** **Compare and contrast** the Contributions of Indian physicists.

**CO3** **Identify** basic concepts, theories and principles and its applications of physics in everyday life.

**CO4** ***Use*** the operations with basic number systems and **identify** its applications in digital electronics.

**Semester-II**

**PH2CRT02: MECHANICS AND PROPERTIES OF MATTER**

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

**CO1** **Describe** the concept of wave motion and able to **construct** different models describing wave motion.

**CO2** A**nalyse** different phenomena associated with wave motion.

**CO3** **Explain** oscillatory motion and **design** and **classify** different oscillators.

**CO4** E***xplain*** *different terms associated with rotational mechanics and* ***obtain solutions*** *to physical problems of rotational mechanics*d error analysis

**Semester-III**

**PH3CRT03: OPTICS, LASER AND FIBER OPTICS**

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

**CO1** **Discuss** the interference phenomenon and **explain** the significance of it by **illustrating** examples.

**CO2** **Resolving** numerical examples of interference in different context.

**CO3** **List out** different types of diffraction and **categorise** various physical problems of diffraction.

**CO4** **Explain** the concept of polarization and **describe** various theorems of it.

**Semester-IV**

**PH4CRT04: SEMICONDUCTOR PHYSICS**

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

**CO1** **Describe** the properties of materials and **application** of semiconductor electronics

**CO2** **Apply** the knowledge of semiconductors to **illustrate** the functioning of basic electronic devices.

**CO3** **Demonstrate** the switching and amplification application of the semiconductor devices.

**CO4** **Demonstrate** the control applications using semiconductor devices.

**SEMESTER V**

**PH5CRT05: ELECTRICITY AND ELECTRODYNAMICS**

CO1 Discuss the theory of moving coil ballistic galvanometer.

CO2 Discuss variation of alternating current with time and define basic parameters and determine mean value and rms values of ac.

CO3 Analyse LCR series circuits and LCR parallel resonant circuit

CO4 Illustrate Superposition, Reciprocity, Thevenin's, Norton's & Maximum power transfer theorems.

**PH5CRT06: CLASSICAL AND QUANTUM MECHANICS**

CO1 Describe principle of virtual work and D'Alembert's principle

CO2 Solve Linear Harmonic oscillator, Planetary motion and Simple Pendulum problems using Lagrange's equation of motion

CO3 Illustrate Calculus of variations to find out Euler Lagrange's equations for shortest distance between two points,Brachistochrone problem

CO4 Identify the limitations of classical mechanics and find the need of quantum mechanics

**PH5CRT07: DIGITAL ELECTRONICS AND PROGRAMMING**

CO1 Compare Digital and analog systems.

CO2 Compare operators, logic symbols and truth tables of different logic gates.

CO3 Summarizing combinational and sequential logic systems

CO4 Use Sum of product method, product of sum method for reducing Boolean expressions.

**PH5CRT08: ENVIRONMENTAL PHYSICS AND HUMAN RIGHTS**

CO1 Explain the Causes, effects and control measures of environmental pollution

CO2 Discuss environmental ethics and various environment protection acts such as air act, water act, wildlife protection act and forest conservation act

CO3 Categorize renewable and non-renewable energy sources

CO4 Classify solar heat energy convertors such as solar cooker, solar still, solar dryer , solar pond

**Semester-VI**

**PH6CRT09: THERMAL AND STATISTICAL PHYSICS**

CO1 Apply first law to isochoric process, isobaric process, adiabatic process.

CO2 Describe the parts of heat engines.

CO3 Apply second law to explain the working of Carnot Refrigerator

CO4 Understand the concept of entropy and change in entropy.

**PH6CRT10: RELATIVITY AND SPECTROSCOPY**

CO1 Extend the Lorentz transformation to concepts of Length contraction, time dilation and relativistic Mass.

CO2 Outline the introductory concepts of general theory of relativity.

CO3 Describe Vector Atom model

CO4 Discuss Zeeman Effect

**PH6CRT11: NUCLEAR, PARTICLE PHYSICS AND ASTROPHYSICS**

CO1 Illustrate General properties of nucleus

CO2 Classify Models of Nuclear structure

CO3 Compare and explain Nuclear Radiation Detectors, Counters and Particle Accelerators

CO4 Describe Gamow's theory of α decay.

**PH6CRT12: SOLID STATE PHYSICS**

CO1 Define the fundamental terms needed to study the structure of a crystal.

CO2 Distinguish the different crystal structures with examples.

CO3 Discuss the classical and quantum theories of free electron model.

CO4 Discuss band theory qualitatively using Kronig – Penney model.

**Choice Based Course**

**PH6CBT03: COMPUTATIONAL PHYSICS**

CO1 Solve Nonlinear Equations by Bisection, Newton Raphson, Regula-Falsi , Secant and Fixed point iteration methods

CO2 Solve system of linear algebraic equations by Gauss elimination method, Gauss-Jordan method Factorization and Iterative methods

CO3 Apply Regression and interpolation methods in Curve fitting

CO4 Explain trapezoidal rule and Simpson's 1/3 and 1/8 rule for numerical integration also state algorithm.

## Physics Practical

## SEMESTER 1&2 (First Year)

### Core Practical 1: PH2CRP01 – Mechanics and Properties of Matter

**Semester 1**

**CO1** Gain practical knowledge by applying the experimental methods to correlate with the Physics theory

**CO2** Apply the analytical techniques and graphical analysis to the experimental data

**CO3** Apply the mathematical concepts/equations to obtain quantitative results

**CO4** To understand the dynamics of different types of pendulum .

**Semester 2**

**CO1** Gain practical knowledge by applying the experimental methods to correlate with the Physics theory

**CO2** Apply the analytical techniques and graphical analysis to the experimental data

**CO3** Apply the mathematical concepts/equations to obtain quantitative results

**CO4** Study of bending behaviour beams and analyse the expression for young's modulus

## SEMESTER 3&4 (Second Year)

### Core Practical 02: PH4CRP02 –Optics and Semiconductor Physics

**Semester 3**

**CO1** Gain practical knowledge by applying the experimental methods to correlate with the Physics theory

**CO2** Apply the analytical techniques and graphical analysis to the experimental data

**CO3** Apply the mathematical concepts/equations to obtain quantitative results

**CO4** To learn focal length of lens and optical constants of different media.

**Semester 4**

**CO1** Gain practical knowledge by applying the experimental methods to correlate with the Physics theory

**CO2** Apply the analytical techniques and graphical analysis to the experimental data

**CO3** Apply the mathematical concepts/equations to obtain quantitative results

**CO4** Distinguish between P-N diode and Zener diode.

## SEMESTER 5 & 6 (Third Year)

**Core Practical : 03**

**PH6CRP03 – Electricity, Magnetism and LASER**

**Semester 5**

CO1 Using Potentiometer Measure resistance of wire

CO2 Calibrate low range and high range voltmeter using Potentiometer

CO3 Calibrate ammeter using Potentiometer and Tangent galvanometer.

CO4 Convert galvanometer into voltmeter and ammeter

**Semester 6**

CO1 Find magnetic moment of a bar magnet using Searle's vibration magnetometer

CO2 Measure resistivity of wireusing Carey Foster's bridge.

CO3 Verify Thevenin's and Norton's theorems

CO4 Determine wavelength of Laser using Grating

**Core Practical : 04**

**PH6CRP04 – Digital Electronics**

**Semester 5**

CO1 Realize logic gates – AND, OR and NOT – Using diodes, transistors etc.

CO2 Realize logic gates – AND, OR and NOT – Using universal gates

CO3 Verification of truth table of NAND, NOR, XOR and XNOR gates

CO4. Verify De Morgan's theorems – Using IC 7400

**Semester 6**

CO1 Construct Astable Multivibrator using Transistor and IC 555

CO2 Construct Monostable Multivibrator using Transistor and IC 555

CO3 Construct and verify A/D converter using IC 741

CO4 Construct SR Flip Flops using IC 7400 and Verify truth table

**Core Practical : 05**

**PH6CRP05 – Thermal Physics, Spectroscopy and C++ Programming**

**Semester 5**

CO1 Use Thermistor to find Temperature coefficient of resistance

CO2 Using Carey Foster's bridge find the Temperature co-efficient of resistance

CO3 Write and execute Computer programming in C++ to Generate Fibonacci series

CO4 Write and execute Computer programming in C++ to Convert a decimal number into binary number

**Semester 6**

CO1 Use Spectrometer find Cauchy's constants

CO2 Use Spectrometer find Resolving power of prism and grating.

CO3 Write and execute Computer programming in C++ to Solve a quadratic equation

CO4 Calculate 'g' from experimental data of Simple Pendulum using Computer programming in C++

**Core Practical : 06**

**PH6CRP06– Acoustics, Photonics and Advanced Semiconductor Physics**

**Semester 5**

CO1 Determine frequency of given tuning forkusingMelde's string

CO2 Use Sonometer to Determine frequency of AC

CO3 Determine frequency of given tuning fork, unknown mass and verification of laws of strings using sonometer

CO4 Measure and draw V- I characteristics of solar cell **CP-PSO Matrix** Correlation levels

**Semester 6**

CO1 Construct Voltage regulator using Zener diode and transistor and study line and load regulations

CO2 Construct and study Voltage multipliers – Doubler &Tripler

CO3 Realize adder and subtractor using OPAMP

CO4 Construct Pulse Width Modulator using IC 555

**PH6PRO01 – Project and Industrial Visit**

CO1 Identify the need of lifelong learning and adapt to changing needs of profession and society and get updated with current state-of-art

CO2 Express ideas clearly and effectively, both verbally and in written form.

CO3 Find links across different areas of knowledge and generate, develop and evaluate ideas and information related to the project.

CO4 Develop ability to work with peers, building teamwork and group skills.

## CORE COURSE 2 - ELECTRONICS

### PH1CRT21-Principles of Electronics

CO1 Understand the current voltage characteristics of semiconductor devices,...

CO2 Design simple analogue circuits

CO3 Evaluate frequency response to understand behaviour of Electronics circuits

CO4 Analyze dc circuits and relate ac models of semiconductor devices with their physical Operation.

### PH1CRT22-Communication Engineering

CO1 Understand fundamental principles of radio communication

C02 Use of different modulation and demodulation techniques used in analog communication

C03 Identify and solve basic communication problems

CO4 Analyze transmitter and receiver circuits

### PH2CRT23-Power Electronics

CO1 Understand the basics of Power Electronics.

CO2 Learn the details of power semiconductor switches (Construction, Characteristics and operation).

CO3 Understand the working of various types of converters.

CO4 Learn how to analyse the converters and design the components of them, under various load types

### PH2CRT24 - Analogue Integrated Circuit

CO1 Understand the fundamentals and areas of applications for the integrated circuits

CO2 Analyze important types of integrated circuits.

CO3 Demonstrate the ability to design practical circuits that perform the desired operations.

CO4 Understand the differences between theoretical, practical & simulated results in integrated circuits.

**PH3CRT25 - Microprocessor and its Application**

CO1 Understand the basic programming in 8085

CO2 How to write application level programmes

CO3 Design microprocessor applications like trafficlight, motorspeed control, washing machine

CO4 Designing of interfacing

**PH3CRT26 - Network Theory**

CO1 Synthesize the network using passive elements.

CO2 Apply concepts of electric network topology nodes, branches, loops to solve circuit problems including the use of computer simulation.

CO3 Apply time and frequency concepts of analysis.

CO4 Understand various functions of network and also the stability of network

**PH4CRT27 - Troubleshooting of Audio Equipment**

CO1 Understand the concept of different loudspeakers, microphones etc

CO2 Understand different types of recording methods

CO3 Understand the working of MP3player, Hometheatre etc

CO4 Understand the working of DVD player

**PH4CRT28 - Troubleshooting of Video Equipment**

CO1 Understand the fundamental concepts of television transmitter and receiver systems, the transmission of video signals and importance of television standards to effectively work with broadcasting applications and to trouble shoot television systems.

CO2 Understand different colour television systems used worldwide and its compatibility.

CO3 Understand principles of digital video and component video signal.

CO4 Understand advanced TV technology, MAC signals and DTH technology

**PH5OPT03 - Computer Hardware and Networking (Open Course)**

CO1 Perform all the functions with Electrical and Electronic Components related to Computer and Networking system following safety precautions.

CO2 Assemble and repair of Desktop Computer with all its hardware components.

CO3 Perform the operations of office package (word, excel, power point).

CO4 Assemble and repair Laptop and its hardware components

## COMPLIMENTARY COURSES 1 - MATHEMATICS

**Semester I**

**MM2CMT01-Numerical Analysis, Matrices, Trignometry and Partial Differentiation**

CO1 Derive appropriate numerical methods to solve algebraic and transcendental equations

CO2 Understand how Numerical Methods can be used to find approximate solutions and study of error by approximation.

CO3 Understand the use of numerical methods for finding approximate root of algebraic equations

CO4 Determine approximate numerical solutions to mathematical problems

**Semester II**

**MM2CMT02 Integral Calculus and Differential Equation**

CO1 Understands how to evaluate double and triple integrals and their use for finding areas and volumes

CO2 Solve the first-order linear differential equations

CO3 Learn how the differential equations are used to study various physical problems such as mass attached to spring and electric circuit problem etc.

CO4 Understand various types of differential equation

**Semester III**

**MM2CMT03 Vector Calculus, Analytic Geometry and Abstract Algebra**

CO1 Understand the abstract structure 'Groups', its Subgroups, cyclic Groups and Permutation Groups, homomorphism and isomorphism

CO2 Enhance problem solving skills.

CO3 Understand vector valued functions and their use for finding tangents, normal, and arc length of space curves.

CO4 Understand the applications of Green's, Stokes' and Divergence Theorem

**Semester IV**

**MM2CMT04----- Fourier Series, Laplace Transforms and Complex Analysis**

CO1 Understand properties of Complex Numbers and functions of a complex variable

CO2 Understand the concept of limit, continuity, differentiability and analyticity of functions of complex variable

CO3 Understand elementary functions of a complex variable

CO4 Understand the concept of Integration of functions of complex variable along a contour

## COMPLIMENTARY COURSES 2 - COMPUTER SCENCE

**Semester 1**

**CA1CMT01- Computer Fundamentals**

CO1 Familiarise operating systems, programming languages, peripheral devices, networking, multimedia and internet

CO2 Understand how logic circuits and Boolean algebra forms as the basics of digital computer

CO3 Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.

CO4 Apply computer science theory and software development fundamentals to produce computing-based solutions.

**Semester 2**

**CA2CMT02-Programing in C language**

CO1 Able to implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems.

CO2 Demonstrate an understanding of computer programming language concepts.

CO3 Develop C programs on linux platform.

CO4 Design and develop computer programs and also analyze, and interpret the concept of pointers.

**Semester 3**

**CA3CMT03- Web Technology and Programming**

CO1 Design and development of web-pages and web-applications

CO2 Retrieve information, and use of documentation and standards

CO3 Learn good design, universal design, multi platform web applications

CO4 Understand formats and languages used in modern web-pages: HTML, XHTML, CSS, XML, XSLT, Javascript, DOM

**Semester 4**

**CA4CMT04- Visual Programming Techniques**

CO1 Create a project. (WC, CCT)

CO2 Use the IDE. (WC, CCT)

CO3 Create a VB application. (WC, CCT)

CO4 Apply Picture Box controls, Text Box controls, and Command Button

# BCom (Model I, Finance & Taxation)

**(CBCS-Under Graduate Degree Programme, 2017 admission onwards, MG University)**

## PROGRAM SPECIFIC OUTCOMES (PSOs)

1. Become worthy global citizens who will emerge as future leaders, entrepreneurs and efficient administrators
2. Facilitate an insight on accounting skills and acquainting the students with latest development in the field.
3. Recognize the fundamental concepts in finance, taxation, marketing, management and e-commerce.
4. Development of quantitative aptitude of students and imparting basic knowledge on research methods.
5. Acquire managerial skills and knowledge focusing on different functional areas of management, thereby enabling them to make managerial decisions.
6. Enable learners to pursue post- graduation and career in taxation, financial services, management, e-commerce etc.

## COURSE OUTCOMES (COs)

**SEMESTER – 1**

### CO1CRT01 : DIMENSIONS AND METHODOLOGY OF BUSINESS STUDIES

1. Create an awareness on various components of business environment
2. Evaluate various stages and developments of business in Indian economy.
3. Analyze the concepts of E Commerce and its technological integration with business.
4. Discuss the significance of ethics and fair governance in modern business.
5. Recognize the various types of business research and the techniques to apply it in the real situation.

### CO1CRT02 : FINANCIAL ACCOUNTING – 1

1. Develop awareness on the basic concepts of Accounting and be able to prepare Financial Statements.
2. Evaluate Single entry and Double entry and equip with the knowledge to do Accounting of Incomplete Records.
3. Apply accounting treatments regarding Royalty, Consignment and to prepare accounts accordingly.
4. Discuss the concepts of various accounts related with farming activities
5. Discuss the concepts of Accounting and be able to prepare Financial Statements.

### CO1CRT03 : CORPORATE REGULATIONS AND ADMINISTRATION

1. Investigate development of Companies Act and Legal framework
2. Appraise the procedure of registration and liquidation procedure as per Companies Act, 2013.
3. Describe the concepts internal and external authority of a company
4. Recognize the role and functions of different stakeholders of the company.
5. Discuss relevance of management and administration of joint stock companies in India

### CO1CMT01 : BANKING AND INSURANCE

1. Construct a basic idea about banking functions
2. Experiment various innovations and reforms in the banking sector
3. Describe different dimensions of relationship between banker and customer
4. Describe insurance sector and various functions
5. State various reforms in this sector
6. Discuss various types of insurance and its principles and practices

**SEMESTER: 2**

**CO2CRT04 : FINANCIAL ACCOUNTING –II**

1. Develop awareness on the concepts of Hire Purchase and learn its accounting treatment.
2. Analyze the concept of branch account and its system.
3. Analyze the scope of departmental accounting.
4. Prepare the accounts of dissolution of a partnership firm.
5. Describe the major Accounting Standards and its Applicability.

**CO2CRT05 : BUSINESS REGULATORY FRAMEWORK**

1. Create an awareness on the Indian Contract ACT 1872 and investigate the concept of contracts and its legal formalities
2. Differentiate the special contracts- Bailment and pledge
3. Discuss the contract of indemnity and contract of guarantee
4. Recognize the law of agency
5. Define the sale of goods ACT 1930

**CO2CRT06 : BUSINESS MANAGEMENT**

1. Develop the basic managerial functions in a common business and non- business environment.
2. Appraise the managerial principles-contributions of F.W.Taylor and Henry Fayol.
3. Analyze various modern tools in management
4. Recognize the significant leadership and motivational theories.
5. Recognize the ability to take effective managerial decisions in various situations.

**CO1CMT02 : PRINCIPLES OF BUSINESS DECISION**

1. Create an insight into the relevance and importance of business decisions
2. Evaluate the application of economic theories in decision making
3. Analyze the demand theory and demand forecasting methods for new products production theory
4. Analyze the production theory and evaluation of cost output relationship
5. Recognize cost theory and pricing theory and report how price is fixed under various market conditions.

**SEMESTER: 3**

**CO3CRT07: CORPORATE ACCOUNTS-I**

1. Create awareness on the features of Shares and Debentures and accounting treatment of redemption of preference shares, ESOP, Right shares, bonus issue and buyback of shares.
2. Evaluate the practice of underwriting of Shares and Debenture
3. Execute an exposure to the company final accounts and providing knowledge to prepare final accounts of companies as per the provisions of Companies Act 2013
4. Describe the construction of Investment accounts and its accounting treatments.
5. Discuss the ascertainment of the value of insurance policy and calculation of insurance claims under different situations.

**CO3CRT08 :QUANTITATIVE TECHNIQUES FOR BUSINESS- I**

1. Create an insight into the basic concepts of Statistics.
2. Equip with the skills to apply the appropriate sampling survey method and collect data.
3. Execute the methods to calculate an appropriate measure of central tendency.
4. Recognize the method to calculate an appropriate measure of dispersion.
5. Recognize the method to extrapolate a value from a series and use it for forecasting.

**CO3CRT09 :FINANCIAL MARKETS AND OPERATIONS**

1. Develop an insight into various financial markets and its operations
2. Evaluate the regulatory authorities in financial markets
3. Relate and distinguish the working of both primary and secondary market
4. Discuss capital market performance and online trading of stocks.
5. Recognize concept financial engineering

**CO3CRT10 :MARKETING MANAGEMENT**

1. Create an insight on broader concepts of marketing and elements in marketing mix.
2. Discuss various principles and practices of marketing management,
3. Create an insight on the role of marketing in business as also to its various stakeholders including consumers and society.
4. To acquire the ability to develop marketing strategies based on product, price and physical distribution.
5. To acquire the ability to analyze marketing problems and provide solutions based on critical examination of marketing information.

**CO3OCT01: GOODS AND SERVICES TAX**

1. Develop an insight on the basic concept of goods and services tax and related terms
2. Appraise concept related to levy and collection of GST
3. Experiment the concept of time and place of goods in GST
4. Experiment the concept of input tax credit and GST payment procedures
5. Discuss the registration and returns and assessment related to GST

**SEMESTER – 4**

**CO4CRT11: CORPORATE ACCOUNTS-II**

1. Investigate about insurance companies and the preparation of final accounts of insurance companies as per IRDA Regulation Act.
2. Evaluate the accounts of banking companies and the preparation of final accounts of Banking Companies as per Banking Companies Act 1949
3. Execute various models of internal reconstruction and its accounting treatment.
4. Create an awareness about amalgamation , absorption and external reconstruction
5. Enable the students to gain an idea of liquidation of companies and its accounting treatment

**CO4CRT12: QUANTITATIVE TECHNIQUES FOR BUSINESS-2**

1. Execute the relationship between variables using correlation.
2. Design a model comprising the variables and using regression.
3. Design and construct appropriate index numbers.
4. Compute a time series analysis of data.
5. Apply the knowledge on determine the probability of simple events.

**CO4CRT13 : ENTREPRENEURSHIP DEVELOPMENT AND PROJECT MANAGEMENT**

1. Create an entrepreneurial spirit among students
2. Equip students for individual freedom, initiative and enterprise by pursuing self-employment and small business entrepreneurship.
3. Create awareness on the opportunities and support for entrepreneurship in India
4. Apply the knowledge on the preparation of a project report
5. Recognize the registration, functions of startups

**CO4OCT01: FINANCIAL SERVICES**

1. Create an insight on the nature and importance of financial services.
2. Distinguish various fund based and non-fund based financial services.
3. Analyze the importance and functions of merchant bankers.
4. Discuss with venture capital and its various stages of financing.
5. Describe securitization of debt and its process.
6. Recognize the concept of credit rating and various credit rating agencies.

**SEMESTER -5**

**CO5CRT14: COST ACCOUNTING – I**

1. Create insight on basic cost concepts and the major classification of costs.
2. Appraise the relevance of material costing and methods of pricing the issue of materials in a firm.
3. Relate the costs on account of labour and measures to control such costs in a firm.
4. Apply the knowledge of allocation and apportionment of all overhead costs in an organization.
5. Apply the knowledge on preparation of cost sheet and reconciliation account for tenders and quotation pricing.

**CO5CRT15: ENVIRONMENT MANAGEMENT AND HUMAN RIGHTS**

1. Create an awareness on the various environmental management aspects
2. Evaluate the importance of biodiversity and its conservation
3. Describe various human rights aspects
4. Discuss the impacts of RTI Act and its application
5. Discuss the relevance of ecosystem and its structure.

**CO5CRT16: FINANCIAL MANAGEMENT**

1. Create awareness on functional areas of financial management and familiarize its principles.
2. Appraise the concept of financing decisions
3. Experiment various capital budgeting methods
4. Experiment the concept of working capital and its estimation
5. Discuss the concept of capital structure and cost of capital
6. Recognize the relevance of dividend calculations and various practice of dividend polices.

**CO5OCT01: INCOME TAX – I**

1. Appraise the method of computing taxable income under the head Income from salary.
2. Apply the method on computing taxable income under the head Income from house property.
3. Apply the method on computing taxable income under the head Profits and gains of business or profession.
4. Discuss on Income Tax Act,1961
5. Apply knowledge to compute taxable income under the three heads of income.

**SEMESTER -6**

**CO6CRT17: COST ACCOUNTING –II**

1. Calculate specific order costing and contract costing
2. Discuss the relevance of service costing and classification of costs of various operating costing industries
3. Discuss on the different costs incurred in various levels of processing and the wastage or losses.
4. Discuss the relevance of marginal costing and the breakeven point analysis
5. Preparation of different types of budgets and to ensure proper control of budget.

**CO6CRT18: ADVERTISEMENT AND SALES PROMOTION**

1. Create awareness on various advertisements and key players in the industry and also understand the ethics in advertisement.
2. Analyze and make decisions regarding the most feasible advertisement appeal and media.
3. Execute pre-testing, post testing and concurrent testing of ads to determine their effectiveness.
4. Identify the dealer, customer and salesmen oriented promotion techniques.
5. Recognize various types of sales persons and also understand the steps involved in sales force management.

**CO6CRT19: AUDITING AND ASSURANCE**

1. Create an awareness on the principles and procedure of auditing
2. Evaluate the duties and responsibilities of auditors
3. Equip students to find out various frauds and malpractices done by companies
4. Apply the knowledge on preparation of an audit report
5. Recognize the electronic environment of auditing.

**CO6CRT20: MANAGEMENT ACCOUNTING**

1. Develop an awareness on management accounting practices
2. Describe the method of interpretation of financial statements
3. Computation and interpretation of various ratios based on financial statements
4. Preparation and analysis of fund flow and cash flow statements
5. Preparation and presentation of general management accounting practices.

**CO6OCT01: INCOME TAX – II**

1. Apply the method on computing taxable income under the head capital gains.
2. Apply the method on computing taxable income under the head Income from other sources.
3. Analyze various deductions under chapter VI A-80C to 80U of Income Tax Act,1961.
4. Discuss the income assessment procedure.
5. Discuss on clubbing provisions and carry forward and set off of losses.
6. Recognize the concepts of TDS, TCS, Advance payment of tax, tax planning, tax avoidance and tax evasion

# BCom (Model II, Computer Applications)

**(CBCS-Under Graduate Degree Programme, 2017 admission onwards, MG University)**

## PROGRAM SPECIFIC OUTCOME (PSO)

**PSO1:** Become worthy global citizens who will emerge as future leaders, entrepreneurs and efficient administrators

**PSO2:** Facilitate an insight on accounting skills and acquainting the students with latest development in the field.

**PSO3:** Recognize the fundamental concepts in finance, marketing, information technology and applications of computer to business and office

**PSO4:** Develop quantitative aptitude and basic knowledge on research methods. Acquire practical knowledge of SPSS for doing social science research

**PSO5:** Acquire practical knowledge in Computerized Accounting and Programming in C Language. Understand the relevance of Data Base Management system in Business

**PSO6:** Develop presentation and analytical skills and able to work in teams by strengthening group dynamics.

## COURSE OUTCOMES (COs)

**SEMESTER – 1**

### CO1CRT01: DIMENSIONS AND METHODOLOGY OF BUSINESS STUDIES

1. Create an awareness on various components of business environment
2. Evaluate various stages and developments of business in Indian economy.
3. Analyze the concepts of E Commerce and its technological integration with business.
4. Discuss the significance of ethics and fair governance in modern business.
5. Recognize the various types of business research and the techniques to apply it in the real situation.

### CO1CRT02: FINANCIAL ACCOUNTING – 1

1. Develop awareness on the basic concepts of Accounting and be able to prepare Financial Statements.
2. Evaluate Single entry and Double entry and equip with the knowledge to do Accounting of Incomplete Records.
3. Apply accounting treatments regarding Royalty, Consignment and to prepare accounts accordingly.
4. Discuss the concepts of various accounts related with farming activities
5. Discuss the concepts of Accounting and be able to prepare Financial Statements.

### CO1CRT03: CORPORATE REGULATIONS AND ADMINISTRATION

1. Investigate development of Companies Act and Legal framework
2. Appraise the procedure of registration and liquidation procedure as per Companies Act, 2013.
3. Describe the concepts internal and external authority of a company
4. Recognize the role and functions of different stakeholders of the company.
5. Discuss relevance of management and administration of joint stock companies in India

### CO1CMT01: BANKING AND INSURANCE

1. Construct a basic idea about banking functions
2. Experiment various innovations and reforms in the banking sector
3. Describe different dimensions of relationship between banker and customer
4. Describe insurance sector and various functions
5. State various reforms in this sector .Discuss various types of insurance and its principles and practices

**SEMESTER: 2**

**CO2CRT04: FINANCIAL ACCOUNTING –II**

1. Develop awareness on the concepts of Hire Purchase and learn its accounting treatment.
2. Analyze the concept of branch account and its system.
3. Analyze the scope of departmental accounting.
4. Prepare the accounts of dissolution of a partnership firm.
5. Describe the major Accounting Standards and its Applicability.

**CO2CRT05: BUSINESS REGULATORY FRAMEWORK**

1. Create an awareness on the Indian Contract ACT 1872 and investigate the concept of contracts and its legal formalities
2. Differentiate the special contracts- Bailment and pedge
3. Discuss the contract of indemnity and contract of guarantee
4. Recognize the law of agency
5. Define the sale of goods ACT 1930

**CO2CRT06: BUSINESS MANAGEMENT**

1. Develop the basic managerial functions in a common business and non- business environment.
2. Appraise the managerial principles-contributions of F.W.Taylor and Henry Fayol.
3. Analyze various modern tools in management
4. Recognize the significant leadership and motivational theories.
5. Recognize the ability to take effective managerial decisions in various situations.

**CO1CMT02: PRINCIPLES OF BUSINESS DECISION**

1. Create an insight into the relevance and importance of business decisions
2. Evaluate the application of economic theories in decision making
3. Analyze the demand theory and demand forecasting methods for new products production theory
4. Analyze the production theory and evaluation of cost output relationship
5. Recognize cost theory and pricing theory and report how price is fixed under various market conditions.

**SEMESTER: 3**

**CO3CRT07: CORPORATE ACCOUNTS-I**

1. Create awareness on the features of Shares and Debentures and accounting treatment of redemption of preference shares, ESOP, Right shares, bonus issue and buyback of shares.
2. Evaluate the practice of underwriting of Shares and Debenture
3. Execute an exposure to the company final accounts and providing knowledge to prepare final accounts of companies as per the provisions of Companies Act 2013
4. Describe the construction of Investment accounts and its accounting treatments.
5. Discuss the ascertainment of the value of insurance policy and calculation of insurance claims under different situations.

**CO3CRT08: QUANTITATIVE TECHNIQUES FOR BUSINESS- I**

1. Create an insight into the basic concepts of Statistics.
2. Equip with the skills to apply the appropriate sampling survey method and collect data.
3. Execute the methods to calculate an appropriate measure of central tendency.
4. Recognize the method to calculate an appropriate measure of dispersion.
5. Recognize the method to extrapolate a value from a series and use it for forecasting.

**CO3CRT09: FINANCIAL MARKETS AND OPERATIONS**

1. Develop an insight into various financial markets and its operations
2. Evaluate the regulatory authorities in financial markets
3. Relate and distinguish the working of both primary and secondary market
4. Discuss capital market performance and online trading of stocks.
5. Recognize concept financial engineering

**CO3CRT10: MARKETING MANAGEMENT**

1. Create an insight on broader concepts of marketing and elements in marketing mix.
2. Discuss various principles and practices of marketing management,
3. Create an insight on the role of marketing in business as also to its various stakeholders including consumers and society.
4. To acquire the ability to develop marketing strategies based on product, price and physical distribution.
5. To acquire the ability to analyze marketing problems and provide solutions based on critical examination of marketing information.

**CO30CT02: INFORMATION TECHNOLOGY FOR BUSINESS**

1. Expand the basic concept of Information Technology and social informatics.
2. Create the concepts of network and communication
3. Able to develop web pages for business by applying information technology
4. Evaluate the concept of computer fundamentals and computer hardware's.
5. Demonstrate the concept of operating system windows, Linux.

**SEMESTER – 4**

**CO4CRT11: CORPORATE ACCOUNTS-II**

1. Investigate about insurance companies and the preparation of final accounts of insurance companies as per IRDA Regulation Act.
2. Evaluate the accounts of banking companies and the preparation of final accounts of Banking Companies as per Banking Companies Act 1949
3. Execute various models of internal reconstruction and its accounting treatment.
4. Create an awareness about amalgamation , absorption and external reconstruction
5. Enable the students to gain an idea of liquidation of companies and its accounting treatment

**CO4CRT12: QUANTITATIVE TECHNIQUES FOR BUSINESS-2**

1. Execute the relationship between variables using correlation.
2. Design a model comprising the variables and using regression.
3. Design and construct appropriate index numbers.
4. Compute a time series analysis of data.
5. Apply the knowledge on determine the probability of simple events.

**CO4CRT13: ENTREPRENEURSHIP DEVELOPMENT AND PROJECT MANAGEMENT**

1. Create an entrepreneurial spirit among students
2. Equip students for individual freedom, initiative and enterprise by pursuing self-employment and small business entrepreneurship.
3. Create awareness on the opportunities and support for entrepreneurship in India
4. Apply the knowledge on the preparation of a project report
5. Recognize the registration, functions of startups

**CO4OCT02: INFORMATION TECHNOLOGY FOR OFFICE**

1. Able to draft letters, Curriculum Vitae and mail merge using MSWord
2. Develop skills to analyze data and presentation using MS Excel
3. Develop skills to create and presenting slides through MS PowerPoint
4. Develop skills to create simple poster using page maker
5. Enable the students to manage the office activities with the help of information technology.

**SEMESTER -5**

**CO5CRT14: COST ACCOUNTING – I**

1. Create insight on basic cost concepts and the major classification of costs.
2. Appraise the relevance of material costing and methods of pricing the issue of materials in a firm.
3. Relate the costs on account of labour and measures to control such costs in a firm.
4. Apply the knowledge of allocation and apportionment of all overhead costs in an organization.
5. Apply the knowledge on preparation of cost sheet and reconciliation account for tenders and quotation pricing.

**CO5CRT15: ENVIRONMENT MANAGEMENT AND HUMAN RIGHTS**

6. Create an awareness on the various environmental management aspects
7. Evaluate the importance of biodiversity and its conservation
8. Describe various human rights aspects
9. Discuss the impacts of RTI Act and its application
10. Discuss the relevance of ecosystem and its structure.

**CO5CMT08: PROGRAMMING IN C**

7. Create the basic programming concept algorithms and flowcharts
8. Provide complete knowledge of **C language**
9. Able to develop logics which will help them to create programs, applications in **C**
10. Apply array, function, structure, union, pointer, file in C Language for problem solving
11. Able to switch over to any other language in the future by learning the basic programming constructs

**CO5OCT02: COMPUTERISED ACCUONTING**

1. Discuss the concept of manual accounting and computerised accounting
2. Provide a practical and theoretical knowledge about the best accounting software Tally ERP 9.

3. Equip the students to understand various usages of the Tally software and its application in business processes for accounting purposes.
4. Develop skills to do various accounting through the Tally ERP software.
5. Recognize the concepts of TDS, TCS, and GST through Tally ERP 9.

**SEMESTER -6**

**CO6CRT17: COST ACCOUNTING –II**

1. Calculate specific order costing and contract costing
2. Discuss the relevance of service costing and classification of costs of various operating costing industries
3. Discuss on the different costs incurred in various levels of processing and the wastage or losses.
4. Discuss the relevance of marginal costing and the breakeven point analysis
5. Preparation of different types of budgets and to ensure proper control of budget.

**CO6CRT18: ADVERTISEMENT AND SALES PROMOTION**

1. Create awareness on various advertisements and key players in the industry and also understand the ethics in advertisement.
2. Analyze and make decisions regarding the most feasible advertisement appeal and media.
3. Execute pre-testing, post testing and concurrent testing of ads to determine their effectiveness.
4. Identify the dealer, customer and salesmen oriented promotion techniques.
5. Recognize various types of sales persons and also understand the steps involved in sales force management.

**CO6CRT20: MANAGEMENT ACCOUNTING**

1. Develop an awareness on management accounting practices
2. Describe the method of interpretation of financial statements
3. Computation and interpretation of various ratios based on financial statements
4. Preparation and analysis of fund flow and cash flow statements
5. Preparation and presentation of general management accounting practices.

**CO6CMT10: DATABSE MANGMENT SYSTEM (DBMS)**

1. Develop students with the concepts of DBMS.

2. Make students capable to handle database for business firms
3. Prepare students with the use of MS Access to create databases .
4. Mold the students to crate table in MS Access
5. Prepare the students to crate Query ,Forms and Reports in Ms Access

**CO6OCT02: SOFTWARE FOR BUSINESS AND RESEARCH**

1. Enhance students for research oriented activities
2. Familiarize students with software developments and working in data analysis
3. Making students focused on research tools and aspects
4. Equip the student in analyzing the data for their project.
5. Familiarize with Libre Office Writer and Calc

## DEPARTMENT OF ENGLISH

## COURSE OUTCOMES (COs) FOR ENGLISH COMMON COURSES

### SEMESTER 1

**Course Title- Fine Tune Your English**
**Course Code- EN1CCO1**
Name of the Programme: BA/ BSc/ BCom

CO 1: Become competent in the use of English Grammar and vocabulary.

CO 2: Become capable of effective communication skills.

CO 3: Use English language as a tool for career advancement.

CO 4: Identify common errors in English to better academic writing skills.

**Course Title- Pearls from the Deep**
**Course Code- EN1CCO2**
Name of the Programme: BA/ BSc

CO 1: Discuss various genres in English literature.

CO 2: Examine literary works by looking at its aesthetic and didactic elements.

CO 3: Design approaches to learn English language through literary works.

CO 4: Evaluate literary works with a newer perspective looking at its intricacies in terms of language use and literary devices.

**SEMESTER 2**

**Course Title- Issues That Matter**
**Course Code- EN2CCO3**
Name of the Programme: BA/ BSc/ BCom

CO 1: Become aware of issues of concern that are of contemporary relevance.

CO 2: Develop a rational and empathetic outlook on such matters.

CO 3: Become active participants in promoting sustainable measures for protecting our environment.

CO 4: Examine colonialism through the lens of issues faced by the colonized natives.

**Course Title- Favouring the Classics**
**Course Code- EN2CCO4**
Name of the Programme: BA/ BSc

CO 1: Identify the canons in world literature.

CO 2: Relate the works as models to emulate for writing the best literature.

CO 3: Evaluate what makes certain works classics by making an in-depth analysis of the anthology.

CO 4: Design various approaches to the study of English Literature

**SEMESTER 3**

**Course Title- Literature and/as Identity**
**Course Code- EN2CCO5**
Name of the Programme- BA/ BSc

CO 1: Evaluate the issues concerning diasporic identity through literature.

CO 2: Analyse the conflict ridden experiences of people belonging to crisis affected regions of South Asia.

CO 3: Examine the literary creations by authors of their life experiences to understand the question of identity representation and its relevance.

CO 4: Investigate the distinctiveness of native communities to decipher their history, tradition and culture.

**Course Title- Gems of Imagination**
**Course Code- EN2CCO6**
Name of the Programme- BCom

CO 1: Examine some of the major works in literature and familiarize various genres in literature.

CO 2: Analyse literature as a means for improving creative aptitude through various writing exercises.

CO 3: Discuss world literature to expand the possibilities of texts for reading.

CO 4: Use English for formal communication effectively.

**SEMESTER 4**

**Course Title- Illuminations**
**Course Code- EN2CCO7**
Name of the Programme- BA/ BSc

CO 1: Discuss motivating stories in literature.

CO 2: Engage with examples of those people who have overcome various hardships in life and emerged successful in their respective fields.

CO 3: Develop an optimistic attitude in life.

CO 4: Locate various works in specific categories of writing, taking into notice the expansiveness of the literary output.

**Course Title- Revisiting the Classics**
**Course Code- EN2CCO8**
Name of the Programme- BCom

CO 1: Identify the canons in world literature.

CO 2: Relate the works as models to emulate for writing the best literature.

CO 3: Evaluate what makes certain works classics by making an in-depth analysis of the anthology.

CO 4: Design various approaches to the study of English Literature

## DEPARTMENT OF MALAYALAM

## COURSE OUTCOMES (COs) OF MALAYALAM COMMON COURSES

### Model 1- BA/BSc

### 1st Semester

### ML1CCT01 Kadha Sahithyam

1. To discuss about famous short stories & writers in mother tongue
2. To explain the history of Malayalam short stories.
3. To relate short stories of different eras.
4. To analyse real life situations through different short stories in Malayalam.

### 2nd Semester

### ML2CCT02 Kavitha

1. To explain the history of modernism in Malayalam poetry.
2. Analyse & inspect living pictures of Keralanadu depicted in Malayalam poetry.
3. To identify poetic images in kavitha.
4. To outline the cultural heritage of our motherland.

### 3rd Semester

### ML3CCTO3 Drysyakalasahithyam.

1. To analyse Kadhakali & it's literature.
2. To compare & contrast ancient, medieval & modern Drisyakalasahithyam.
3. To examine the role of criticism in Thullal sahithyam.
4. Classify the society through its art & literature.
5. To rate Kerala society through its cinemas

### 4th Semester

### ML4CCT04 Malayala Gadhyarachanakal.

1. To compare linguistic peculiarities of dravidian languages.
2. To identify the legends in music, painting & printing related to Keralanadu.

3. To analyse the biographical literature.
4. To analyse the role of SPCS in the growth of Malayalam book printing & distribution
5. To identify scientific essays in Malayalam language.

**B.Com. Model 1**

**1st Semester**

**ML1CCT05 - Kadhayum Kavithayum**

1. To explain famous short stories & writers in Malayalam language & literature.
2. To assess poems & poetic images in Malayalam.
3. To discuss the history of modernism & post modernism in Malayalam.
4. To evaluate feminism in Malayalam short stories & poems.

**2nd Semester**

**ML2CCT06- Aathmakadha, Lekhanam.**

1. To identify the autobiographical literature.
2. Analyse the living memories of the autobiographers.
3. To evaluate the personality development of autobiographers.
4. To outline Malayalam prose.
5. To categorize & rate different personalities related to Malayalam autobiographical literature.

**BA Model 2**

**1st Semester**

**ML1CCT07- Kadha, Novel**

1. To discuss the history of Malayalam novels.
2. Analyse the living pictures depicted in Malayalam novels
3. To justify modernism & post modernism in Malayalam short stories.
4. Relate Malayalam short stories of different era's

**2nd Semester**

**ML2CCT08- Kavithayum Natakavum**

1. To inspect poetic images in Malayalam kavitha.

2. To evaluate modernism & post modernism in Malayalam poetry.
3. Analyse living pictures in Malayalam dramas
4. To outline feminism in Malayalam language & literature.

**BSc Model 2**

**1st Semester**

**ML1CCT09 Kadha, Kavitha**

1. To explain the history of Malayalam poetry.
2. To assess poetic images.
3. To analyse post modernism in Malayalam short stories.
4. Relate short stories of different eras.

**2nd Semester**

**ML2CCT10 Gadhyaparichayam**

1. To identify & rate feminism.
2. To analyse music in Kerala related voice & noise.
3. To explain autobiographical literature in Malayalam
4. To outline Malayalam prose.
5. To identify the milestones in the development of our motherland through its literature.

**BCom Model 2**

**1st Semester**

**ML1CCT11- Kadha, Kavitha, Natakam**

1. To illustrate famous short stories & writers in Malayalam.
2. To analyse modernism & post modernism in Malayalam.
3. To assess poetic images in Malayalam.
4. To compare & contrast life situations through Malayalam drama.

**2nd Semester**

**ML2CCT12- Gadhyam, Yathravivaranam**

1. To outline Malayalam prose.
2. To analyse music in Kerala related to voice & noise.

3. To investigate on feminism.
4. To identify the milestones in the development of our motherland through its literature
5. To identify & categorize Malayalam travelogues.
6. To outline geographical peculiarities of distant places through Malayalam travelogues.

**DEPARTMENT OF HINDI**

**COURSE OUTCOMES (COs) OF HINDI COMMON COURSES**

## Model 1 – BA/BSc

Upon successful completion of the course, a student will be able to

**1st Semester**

### Paper I – Prose & One-act Plays

1) Discuss the contemporary and anicient Hindi literature.
2) Explain human rights and gender issues from environment studies
3) Assess important features of various fictions, Hindi drama, one-act plays and its authors.
4) Describe the importance of moral life and values in human life.

**2nd Semester**

### Paper-II – Short Stories & Novel

1. Discuss the literature in its aesthetic sense to make apt appreciations.
2. Outline culture and social responsibility.
3. Classify different types of short stories, famous novels and its authors

**3rd Semester**

### Paper III – Poetry, Grammar and Translation

1. Translate from Hindi to English and vice versa.
2. Able to communicate in Hindi and carry out language teaching.
3. Recommend the right use of Hindi words following the Grammar.
4. Examine the aesthetic expression of poetry and its relation to the culture.

**4th Semester**

### Paper IV – Drama and Long Poem

1. Communicate effectively in Hindi
2. Develop awareness of culture and social responsibility.
3. Analyze various modes of fiction together with postmodernism and modern poetry.

**Model I - BCom**

Upon successful completion of the course, a student will be able to

**1st Semester**

**Paper I – Prose & Mass Media**

1. Explain the role of communication in development media.
2. Discuss the relevance of communication in media and society.
3. Examine the link between literature and film
4. Develop a sense of awareness on the environment and its various problems.

**2nd Semester**

**Paper II Poetry, Commercial Correspondence & Translation**

1. Secure basic skill in translation through various exercises
2. Describe the emerging trends in aesthetic poetry.
3. Translate from Hindi to English and vice versa.
4. Able to communicate in Hindi and carry out language teaching..

**Model II BCom**

Upon successful completion of the course, a student will be able to

**1st Semester**

**Paper I – Prose, Commercial Correspondence and Translation**

1. Secure basic skill in translation through various exercises
2. Describe the emerging trends in aesthetic poetry.
3. Translate from Hindi to English and vice versa.
4. Able to communicate in Hindi and carry out language teaching..

**2nd Semester**

**Paper II – Poetry and Mass Media**

1. Implement functional Hindi in the fields of administration, science and technology.
2. Describe the role of communication in development media.
3. Explain the relevance of communication in media and society
4. Examine links between literature and film.

**Model II – BA**

Upon successful completion of the course, a student will be able to

**1st Semester**

**Paper I – Drama and Long Poem**

1. Use Hindi proficiently.
2. Synthesize drama as an art form.
3. Identify the positive values literature brings in
4. Explain about modernism and modern poetry.

**2nd Semester**

**Paper II –Prose and Poetry**

1. Understand how their decisions and actions affect the environment through environmental education
2. Explain the inter-relationship between man and environment and attains the spirit to protect nature and natural resources.
3. Identify the link between poetry and the culture of the region.
4. Describe about ancient and modern poetry.

**Model II. BSc**

Upon successful completion of the course, a student will be able to

**1st Semester**

**Paper I Poetry & One-act Play**

1. Relate postmodernism and modern poetry.
2. Describe various types of fictions, Hindi one-act play writers, important features about drama and one-act plays.
3. Discuss the contemporary and anicient Hindi literature.
4. Describe the importance of moral life and values in human life.

**2nd Semester**

**Paper II – Prose and Short Stories**

1. Develop a positive attitude about the environment
2. Explain the various types of fictions

3. Write about the famous Hindi writers
4. Analyse the different types of short stories