M.S. Ramaiah University of Applied Sciences

New BEL Road, MSR Nagar, Bangalore – 560054

RAMAIAH
UNIVERSITY
OF APPLIED SCIENCES

PO, PSO, PEO & CO

Programme: B. Sc. (Hons) in Chemistry
Programme Code: 407

Programme Outcome (PO)
Programme Specific Outcome (PSO)
Program Educational Objectives (PEO)
Course Outcomes (CO)

Faculty of Mathematical & Physical Sciences

Programme Name: B. Sc. (Hons) Chemistry

Programme Outcomes (PO's)

At the end of the B. Sc. (Hons) (Chemistry) program, the graduate will be able to:

PO 1. Identify and describe basic laws and principles governing natural and man-made physical and chemical systems

PO 2. Explain the underlying scientific principles that govern the chemical systems

PO 3. Explain the mathematical methods and their applications for chemical systems

PO 4. Model and simulate simple chemical systems based on principles of chemistry, solve and interpret the results

PO 5. Perform duties as per the scientific protocols in various laboratories

PO 6. Use commercially available software tools like MATLAB for solving problems in Chemistry

PO 7. Work under various constraints to meet project targets

PO 8. Manage information, develop technical reports and make presentations

PO 9. Build, Manage and Lead a team to successfully complete a project and Communicate across teams and organizations to achieve professional objectives

PO 10. Adopt to the chosen profession by continuously upgrading his/her knowledge and understanding through Life-long Learning philosophy.

Programme Specific Outcomes (PSOs)

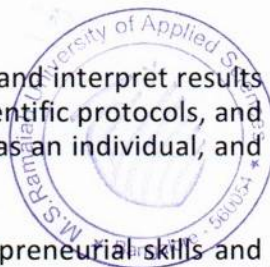At the end of the B. Sc. (Hons) (Chemistry) program, the graduate will be able to:

PSO - 1. Apply the knowledge of Chemistry and Physics to identify and explain basic laws and principles governing physical and chemical systems by using various methods including mathematical and statistical methods.

PSO – 2. Model and simulate simple physical and chemical systems, solve and interpret results obtained through experimentation and perform duties as per scientific protocols, and perform duties as per scientific protocols, demonstrate to work as an individual, and as a leader.

PSO – 3. Demonstrate ethics, leadership qualities, communication, entrepreneurial skills and involvement in lifelong learning for the betterment of organization, environment and society.

Dean
Faculty of Engineering and Technology
M.S. Ramaiah University of Applied Sciences
Bangalore-560058

RUAS- PO, PSO, PEO & CO

Program Educational Objectives (PEOs)

At the end of the B. Sc. (Hons) (Chemistry) program, the graduate will be able to:

PEO – 1. To provide students a fundamental knowledge in chemistry to enable them to deliver efficient solutions for complex scientific problems using analytical and cognitive skills in their chosen domain.

PEO – 2. To enable students to apply appropriate tools, techniques, methods and understand utilization of resources in laboratories and computational skills in their chosen domain and work as an individual as well as lead team in multidisciplinary settings.

PEO – 3. To inculcate ethics, environmental sustainability, communication, soft, managerial and entrepreneurial skills for a successful career in the chosen profession and to engage in lifelong learning and also work towards developing sustainable society.

Course Outcomes (COs)

Course Title & Code: Mechanics (PYC111A)

After undergoing this course students will be able to:

CO-1. Explain the concepts in One and two dimensional kinematics, laws of motion, rigid body dynamics, gravitation and elasticity, fluid mechanics and special theory of relativity

CO-2. Formulate the relevant expressions in laws of motions, rigid body dynamics, gravitation, elasticity, fluid mechanics and special theory of relativity

CO-3. Solve problems in laws of motions, rigid body dynamics, gravitation, elasticity, fluid mechanics and special theory of relativity

CO-4. Apply the concepts of laws of motions, rigid body dynamics, gravitation, elasticity, fluid mechanics and special theory of relativity to understand the real life physical problems

CO-5. Plan the experimental set-up, conduct experiments, calculate and plot the graphs to obtain the results and write a laboratory report as per the prescribed format.

Course Outcomes (COs)

Course Title & Code: Fundamentals of Chemistry-1 (CYC111A)
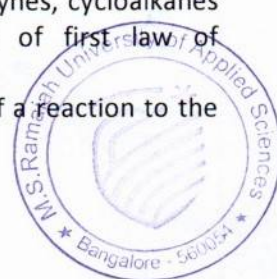
After undergoing this course students will be able to:

CO-1. Describe the properties of liquids, nature of matter and periodic properties of some of elements

CO-2. Explain the basic concepts of orbitals based on rules for filling up of electrons in orbitals, thermodynamics, qualitative and quantitative analysis, chemistry of aliphatic and aromatic hydrocarbons, Introduction of chemical bonding.

CO-3. Identify the factors affecting properties of liquids, alkanes, alkenes, alkynes, cycloalkanes and aromatic hydrocarbons and their stereochemistry, limitations of first law of thermodynamics and surface tension

CO-4. Relate the temperature dependence of the change in internal energy of a reaction to the

difference in isochoric heat capabilities of reactions to temperature, properties of beryllium and aluminium

CO-5. Determine the effective nuclear charge and electronegativity of atoms, surface tension of liquids and assess the stability of orbitals

CO-6. Conduct experiments as per the standard procedures and tabulate the measured values, calculate the limiting reagent, theoretical yield, and percent yield

Course Outcomes (COs)

Course Title & Code: Mathematics – 1 (MTC111A)

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

CO-1. Explain the principles of differential and integral calculus of multivariate functions

CO-2. State and prove important theorems such as Rolle's theorem, Lagrange and Cauchy mean value theorem, Taylor's theorem and Euler's theorem

CO-3. Solve simple mathematical problems associated with differential and integral calculus of multivariate functions

CO-4. Apply differential and integral calculus to model real world problems

CO-5. Solve complex real world problems associated with differential and integral calculus of multivariate functions

Course Outcomes (COs)

Course Title & Code: Introduction to Statistics and Probability (STC111A)

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

CO-1. Explain the basic definitions, importance and significance of statistics and probability in data analysis and quantification of randomness

CO-2. State and prove the important theorems in central tendency, dispersion, and probability

CO-3. Solve simple problems using measures of central tendency, dispersion, probability and univariate random variables.

CO-4. Model and solve the real world problems using univariate and bivariate random variables

CO-5. Solve complex problems arising in real world involving data analysis, univariate and bivariate random variables.

***

Registrar
M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054

Dean
Faculty of Engineering and Technology
M.S. Ramaiah University of Applied Sciences
Bangalore-560058

M.S. Ramaiah University of Applied Sciences

New BEL Road, MSR Nagar, Bangalore – 560054

PO, PSO, PEO & CO

Programme: B.Sc. (Hons) in Mathematics
Programme Code: 431

Programme Outcome (PO)
Programme Specific Outcome (PSO)
Program Educational Objectives (PEO)
Course Outcomes (CO)

Dean
Faculty of Engineering and Technology
M.S. Ramaiah University of Applied Sciences
Bangalore-560058

Registrar
M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054

Faculty of Mathematical & Physical Sciences

Programme Name: B. Sc. (Hons) Mathematics

Programme Outcomes (PO's)

At the end of the B. Sc. (Hons) (Mathematics) program, the graduate will be able to:

PO-1. Scientific Knowledge: Apply fundamental knowledge of Physics, Chemistry, Mathematics, Statistics, Computer Science and Electronics to solve real life problems in their chosen domain

PO-2. Knowledge dissemination and Administration: Teach in schools with relevant training and perform administrative duties in government, semi-government, private and public sector organizations

PO-3. Problem Solving: Understand and solve scientific problems by conducting experimental investigations

PO-4. Modern Tool Usage: Apply appropriate tools, techniques and understand utilizationof resources appropriately in various laboratories

PO-5. Computational Skills: Apply basic computational skills in their chosen domains

PO-6. The Science, Society and Ethics: Understand the effect of scientific solutions on legal, cultural, social, public health and safety aspects, and apply ethical principles to scientific practices and professional responsibilities

PO-7. Environment and sustainability: Understand sustainable solutions and their effect on society and environment

PO-8. Individual and teamwork: Work as a member of a team, to plan and to integrate knowledge of various disciplines as individual and to lead teams in multidisciplinary settings

PO-9. Communication: Make effective oral presentations and communicate technical ideas to a broad audience using written and oral means

PO-10. Life-long learning: Adapt to the changes and advancements in science and engage in independent and life-long learning.

Programme Specific Outcomes (PSOs)

At the end of the B. Sc. (Hons) Mathematics programme, the graduate will be able to:

PSO-1. Apply the basic principles of Mathematics to model, simulate, solve and interpret the results of scientific problems

PSO-2. Apply the basic principles of Physics, Chemistry and Statistics to solve scientific problems

PSO-3. Demonstrate ethics, leadership qualities, communication, entrepreneurial skills and involvement in lifelong learning for the betterment of organization, environment and society

Program Educational Objectives (PEOs)

The objectives of the B. Sc. (Honors) Mathematics Programme are to:

PEO-1. To provide students a knowledge in science to enable them to deliver efficient solutions for complex scientific problems using analytical and cognitive skills in **their**chosen domain

PEO-2. To enable students to apply appropriate tools, techniques and understand utilization of resources in laboratories and computational skills in their chosen domains and work as an individual as well as lead team in multidisciplinary settings

PEO-3. To inculcate ethics, environmental sustainability, communication, soft, managerial and entrepreneurial skills for a successful career in industries and to engage in lifelong learning

Course Outcomes (COs)

Course Title & Code: Mechanics (PYC111A)

After undergoing this course students will be able to:

CO-1. Explain the concepts in One and two dimensional kinematics, laws of motion, rigid body dynamics, gravitation and elasticity, fluid mechanics and special theory of relativity

CO-2. Formulate the relevant expressions in laws of motions, rigid body dynamics, gravitation, elasticity, fluid mechanics and special theory of relativity

CO-3. Solve problems in laws of motions, rigid body dynamics, gravitation, elasticity, fluid mechanics and special theory of relativity

CO-4. Apply the concepts of laws of motions, rigid body dynamics, gravitation, elasticity, fluid mechanics and special theory of relativity to understand the real life physical problems

CO-5. Plan the experimental set-up, conduct experiments, calculate and plot the graphs to obtainthe results and write a laboratory report as per the prescribed format.

Dean
Faculty of Engineering and Technology
M.S. Ramaiah University of Applied Sciences
Bangalore-560058

RUAS- PO, PSO, PEO & CO

Course Outcomes (COs)

Course Title & Code: Fundamentals of Chemistry-1 (CYC111A)

After undergoing this course students will be able to:

CO-1. Describe the properties of liquids, nature of matter and periodic properties of some of elements

CO-2. Explain the basic concepts of orbitals based on rules for filling up of electrons in orbitals, thermodynamics, qualitative and quantitative analysis, chemistry of aliphatic and aromatic hydrocarbons, Introduction of chemical bonding.

CO-3. Identify the factors affecting properties of liquids, alkanes, alkenes, alkynes, cycloalkanes and aromatic hydrocarbons and their stereochemistry, limitations of first law of thermodynamics and surface tension

CO-4. Relate the temperature dependence of the change in internal energy of a reaction to the difference in isochoric heat capabilities of reactions to temperature, properties of berylliumand aluminium

CO-5. Determine the effective nuclear charge and electronegativity of atoms, surface tension of liquids and assess the stability of orbitals

CO-6. Conduct experiments as per the standard procedures and tabulate the measured values, calculate the limiting reagent, theoretical yield, and percent yield

Course Outcomes (COs)

Course Title & Code: Mathematics – 1 (MTC111A)

After undergoing this course students will be able to:

CO-1. Explain the principles of differential and integral calculus of multivariate functions

CO-2. State and prove important theorems such as Rolle's theorem, Lagrange and Cauchy mean value theorem, Taylor's theorem and Euler's theorem

CO-3. Solve simple mathematical problems associated with differential and integral calculus of multivariate functions

CO-4. Apply differential and integral calculus to model real world problems

CO-5. Solve complex real world problems associated with differential and integral calculus of multivariate functions

Course Outcomes (COs)

Course Title & Code: Introduction to Statistics and Probability (STC111A)
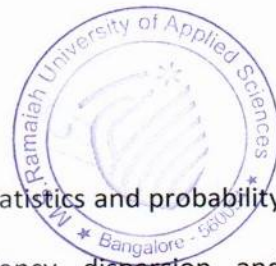
After undergoing this course students will be able to:

CO-1. Explain the basic definitions, importance and significance of statistics and probability in data analysis and quantification of randomness

CO-2. State and prove the important theorems in central tendency, dispersion, and probability

RUAS- PO, PSO, PEO & CO

CO-3. Solve simple problems using measures of central tendency, dispersion, probability and univariate random variables.

CO-4. Model and solve the real world problems using univariate and bivariate random variables

CO-5. Solve complex problems arising in real world involving data analysis, univariate and bivariate random variables.

Course Outcomes (COs)

Course Title & Code: English for Communication 1 (TSM101A)

After undergoing this course students will be able to:

CO-1. Identify the nuances of communication skills
CO-2. Apply the concepts of grammar in written communication
CO-3. Apply professional etiquette as appropriate
CO-4. Practice extempore and basic conversation skills
CO-5. Practice comprehension skills
CO-6. Compose precise paragraphs as per the given topic

Course Outcomes (COs)

Course Title & Code: Introduction to Scientific Programming (MTM101A)

After undergoing this course students will be able to:

CO-1. Perform basic operations in MATLAB
CO-2. Plot graphs using MATLAB built-in commands
CO-3. Write and execute programs using MATLAB
CO-4. Solve simple mathematical problems and compare the results with that of solutions obtained using MATLAB
CO-5. Solve complex real world mathematical problems and compare the results with that of solutions obtained using MATLAB

Course Outcomes (COs)

Course Title & Code: Electricity and Magnetism (PYC112A)

After undergoing this course students will be able to:

CO-1. Explain the basic laws of electricity and magnetism
CO-2. Describe dielectric properties of matter relevant to electricity
CO-3. Formulate the expression relevant to electricity and magnetism
CO-4. Apply principles of electromagnetism in various practical applications
CO-5. Solve relevant problems on electricity and magnetism

Course Outcomes (COs)

Course Title & Code: Fundamentals of Chemistry-2 (CYC121A)

After undergoing this course students will be able to:

CO-1. Explain the physical and chemical properties of noble gases, transition elements and coordination compounds, VSEPR theory, Clausius-Clapeyron equation, Collision theory of reaction rates, and chemistry of oxygen containing functional groups

CO-2. Discuss the phase equilibria of one and two component system, chemical kinetics of the reactions, stereochemistry of coordination complexes and organic compounds, stability of various oxidation states

CO-3. Discuss the chemistry of aromatic compounds, isomerism in organic and inorganic compounds, Electrophilic aromatic substitution in aromatic compounds and apply Hückel's rule to find the aromaticity

CO-4. Derive the expressions for first and second order rate equations, and discuss the industrial applications of oxygen containing functional groups.

CO-5. Conduct experiments as per the standard procedures and tabulate the measured values, calculate the limiting reagent, theoretical yield, and percent yield

Course Outcomes (COs)

Course Title & Code: Mathematics – 2 (MTC121A)

After undergoing this course students will be able to:

CO-1. Explain the principles of differential equations, multiple integrals, numerical analysisand complex analysis

CO-2. State and prove important theorems such in differential equations, multiple integrals, numerical analysis and complex analysis

CO-3. Solve simple mathematical problems associated with differential equations, multiple integrals, numerical analysis and complex analysis

CO-4. Apply differential equations and multiple integrals to model real world problems

CO-5. Solve complex real world problems associated with differential equations, multiple integrals, numerical analysis and complex analysis

Course Outcomes (COs)

Course Title & Code: Probability Distributions (STC121A)

After undergoing this course students will be able to:

CO-1. Explain the concepts of random variables, probability distribution of random variables, joint probability distribution.

CO-2. State and prove the important theorems in probability distributions and correlation and regression.

CO-3. Solve simple problems associated with univariate and bivariate random variables, probability distributions, correlation and regression.

- **CO-4.** Model and solve the real world problems associated with univariate and bivariate random variables.
- **CO-5.** Solve complex problems associated with univariate and bivariate random variables, probability distributions, correlation and regression analysis

Course Outcomes (COs)

Course Title & Code: Environmental Studies (BTN101A)

After undergoing this course students will be able to:

- **CO-1.** Illustrate the multidisciplinary nature of environmental studies and recognize the need for public awareness
- **CO-2.** Explain the various natural resources and their associated problems, ecosystem, and environmental pollution
- **CO-3.** Analyse the concept of ecosystem and classify various types
- **CO-4.** Compare biodiversity at local, national and global levels
- **CO-5.** Discuss various social issues pertaining to environment including sustainable development and energy issues

Course Outcomes (COs)

Course Title & Code: Linear Algebra (MTC211A)

After undergoing this course students will be able to:

- **CO-1.** Illustrate the principles of matrix theory, vector spaces, linear transformation, inner product spaces and decomposition of matrices
- **CO-2.** State and prove important theorems in linear algebra
- **CO-3.** Solve simple mathematical problems in matrix theory, vector spaces,
- **CO-4.** Apply numerical algorithms to solve linear systems and to decompose matrices
- **CO-5.** Solve complex real world problems associated with matrix theory, vector spaces, linear transformation, inner product spaces and decomposition of matrices

Course Outcomes (COs)

Course Title & Code: Advanced Calculus (MTC212A)

After undergoing this course students will be able to:

- **CO-1.** Explain basic concepts related to partial derivatives, vectors, vector functions, scalar functions, gradient of a scalar function, divergence of a vector function, curl of a vector function, line integral, surface integrals, beta function and gamma function.
- **CO-2.** State and prove important theorems such as Green's theorem, Stoke's theorem, and Gauss divergence theorem.
- **CO-3.** Solve simple mathematical problems associated with maxima, minima, gradient, curl, divergence, Stoke's theorem, divergence theorem, path integrals, surface integrals, beta

and gamma function.

CO-4. Apply calculus to model real world problems on advanced calculus

CO-5. Solve complex real world problems associated with maxima, minima, vector calculus, vector integral calculus, path integrals, surface integrals, beta and gamma function

Course Outcomes (COs)

Course Title & Code: Numerical Analysis - 1 (MTE211A)

After undergoing this course students will be able to:

CO-1. Illustrate various methods of numerical solutions of non-linear equations, non-linear system of equations, curve fitting, interpolation, numerical differentiation and integration

CO-2. State and prove theorems on convergence and stability of numerical algorithms

CO-3. Solve simple problems using numerical methods.

CO-4. Apply numerical methods to solve real world problems

CO-5. Solve complex problems associated with numerical techniques

Course Outcomes (COs)

Course Title & Code: Statistical Data Analysis using Microsoft EXCEL & R (MPO101A)
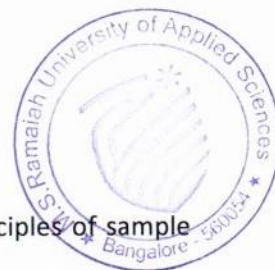
After undergoing this course students will be able to:

CO-1. Explain the basic statistical methods for data analysis

CO-2. Explain the basic operations in MS EXCEL and R

CO-3. Summarizing and presenting the data using MS excel and R

CO-4. Solve simple problems associated with univariate and bivariate random variables, probability distributions, correlation and regression.

CO-5. Solve complex problems associated with univariate and bivariate random variables, probability distributions, correlation and regression analysis.

Course Outcomes (COs)

Course Title & Code: Survey Sampling and Indian Official Statistics (STE211A)

After undergoing this course students will be able to:

CO-1. Explain the concept of Sampling, different types of sampling, basic principles of sample survey and various official statistical system in India.

CO-2. State and prove the important theorems on probability of selecting a sample, estimation of population mean, total and proportion.

CO-3. Solve simple mathematical problems associated with different types of sampling.

CO-4. Model and solve the real world problems associated with different sampling techniques used for designing and selecting a sample from a population.

CO-5. Solve complex problems using different types of sampling techniques.

Course Outcomes (COs)

Course Title & Code: Ordinary Differential Equations (MTC221A)

After undergoing this course students will be able to:

- **CO-1.** Explain the principles of higher order, system of differential equations, and series solutions
- **CO-2.** Solve linear higher order differential equations and system of differential equations
- **CO-3.** Solve system of differential equations and derive power series solutions of differential equations
- **CO-4.** Apply differential equations to model physical phenomena and dynamical systems
- **CO-5.** Solve complex real world problems associated with ordinary differential equations

Course Outcomes (COs)

Course Title & Code: Abstract Algebra (MTC222A)

After undergoing this course students will be able to:

- **CO-1.** Illustrate basic concepts of group theory and ring theory
- **CO-2.** State and prove important theorems of group theory and ring theory
- **CO-3.** Solve simple problems in group theory and ring theory
- **CO-4.** Apply the concepts of group theory and ring theory to solve mathematical problems
- **CO-5.** Solve complex problems in group theory and ring theory

Course Outcomes (COs)

Course Title & Code: Statistical Inference (STE221A)

After undergoing this course students will be able to:

- **CO-1.** Explain the concept and principles of estimation, sampling distributions and testing of hypothesis.
- **CO-2.** State and prove the important theorems in estimation, sampling distributions and hypothesis testing.
- **CO-3.** Solve simple mathematical problems associated with estimation, sampling distributions and hypothesis testing.
- **CO-4.** Model and solve the real world problems associated with estimation, sampling distributions and hypothesis testing.
- **CO-5.** Solve complex problems associated with estimation, sampling distributions, and hypothesis testing.

Dean
Faculty of Engineering and Technology
M.S. Ramaiah University of Applied Sciences
Bangalore-560058

Course Outcomes (COs)

Course Title & Code: Applied Statistics (STE222A)

After undergoing this course students will be able to:

CO-1. Explain the concept of time series, vital statistics, index numbers and statistical quality control.

CO-2. State and prove the important theorems in time series, vital statistics, index numbers and statistical quality control.

CO-3. Solve simple problems associated with time series, vital statistics, index numbers, and statistical quality control.

CO-4. Model and solve real world problems associated with time series, vital statistics, index numbers and statistical quality control.

CO-5. Solve complex problems associated with time series, index numbers, statistical quality control and vital statistics.

Course Outcomes (COs)

Course Title & Code: Statistical Modelling using R (MPO102A)

After undergoing this course students will be able to:

CO-1. Explain the basics of statistical inference, regression models, and time series models.

CO-2. Discuss the fundamental assumptions in statistical inference, regression and time series analysis

CO-3. Solve simple problems associated with statistical inference, regression and time series using R.

CO-4. Model and solve real world problems associated with statistical inference, regression and time series using R.

CO-5. Solve complex problems associated with statistical inference, regression and time series using R.

***

Dean
Faculty of Engineering and Technology
M.S. Ramaiah University of Applied Sciences
Bangalore-560058

Registrar
M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054

RUAS- PO, PSO, PEO & CO

M.S. Ramaiah University of Applied Sciences

New BEL Road, MSR Nagar, Bangalore – 560054

RAMAIAH UNIVERSITY OF APPLIED SCIENCES

PO, PSO, PEO & CO

Programme Name: B. Sc. (Hons) in Physics
Programme Code: 407

Programme Outcome (PO)
Programme Specific Outcome (PSO)
Program Educational Objectives (PEO)
Course Outcomes (CO)

Dean
Faculty of Engineering and Technology
M.S. Ramaiah University of Applied Sciences
Bangalore-560058

Registrar
M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054

Faculty of Mathematical & Physical Sciences

Programme Name: B. Sc. (Hons) Physics

Programme Outcomes (PO's)

At the end of the B. Sc. (Hons) (Physics) program, the graduate will be able to:

PO 1. Identify and describe basic laws and principles governing natural and man-made physical and chemical systems

PO 2. Explain the underlying scientific principles that govern the chemical systems

PO 3. Explain the mathematical methods and their applications for chemical systems

PO 4. Model and simulate simple chemical systems based on principles of Physics, solve and interpret the results

PO 5. Perform duties as per the scientific protocols in various laboratories

PO 6. Use commercially available software tools like MATLAB for solving problems in Physics

PO 7. Work under various constraints to meet project targets

PO 8. Manage information, develop technical reports and make presentations

PO 9. Build, Manage and Lead a team to successfully complete a project and Communicate across teams and organizations to achieve professional objectives

PO 10. Adopt to the chosen profession by continuously upgrading his/her knowledge and understanding through Life-long Learning philosophy

Programme Specific Outcomes (PSOs)

At the end of the B. Sc. (Hons) (Physics) program, the graduate will be able to:

PSO - 1. Apply the knowledge of Physics and Chemistry to identify and explain basic laws and principles governing physical and chemical systems by using various methods including mathematical and statistical methods.

PSO – 2. Model and simulate simple physical and chemical systems, solve and interpret results obtained through experimentation and perform duties as per scientific protocols, and perform duties as per scientific protocols, demonstrate to work as an individual, and as a leader.

PSO – 3. Demonstrate ethics, leadership qualities, communication, entrepreneurial skills and involvement in lifelong learning for the betterment of organization, environment and society.

Dean
Faculty of Engineering and Technology
M.S. Ramaiah University of Applied Sciences
Bangalore-560058

Program Educational Objectives (PEOs)

At the end of the B. Sc. (Hons) (Physics) program, the graduate will be able to:

PEO – 1. To provide students a fundamental knowledge in Physics to enable them to deliver efficient solutions for complex scientific problems using analytical and cognitive skills in their chosen domain.

PEO – 2. To enable students to apply appropriate tools, techniques, methods and understand utilization of resources in laboratories and computational skills in their chosen domain and work as an individual as well as lead team in multidisciplinary settings.

PEO – 3. To inculcate ethics, environmental sustainability, communication, soft, managerial and entrepreneurial skills for a successful career in the chosen profession and to engage in lifelong learning and also work towards developing sustainable society.

Course Outcomes (COs)

Course Title & Code: Mechanics (PYC111A)

After undergoing this course students will be able to:

CO-1. Explain the concepts in One and two dimensional kinematics, laws of motion, rigid body dynamics, gravitation and elasticity, fluid mechanics and special theory of relativity

CO-2. Formulate the relevant expressions in laws of motions, rigid body dynamics, gravitation, elasticity, fluid mechanics and special theory of relativity

CO-3. Solve problems in laws of motions, rigid body dynamics, gravitation, elasticity, fluid mechanics and special theory of relativity

CO-4. Apply the concepts of laws of motions, rigid body dynamics, gravitation, elasticity, fluid mechanics and special theory of relativity to understand the real life physical problems

CO-5. Plan the experimental set-up, conduct experiments, calculate and plot the graphs to obtain the results and write a laboratory report as per the prescribed format.

Course Outcomes (COs)

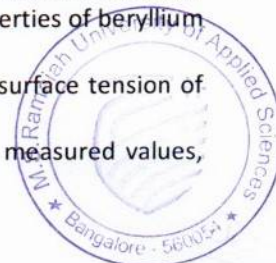**Course Title & Code: Fundamentals of Chemistry-1 (CYC111A)**

After undergoing this course students will be able to:

CO-1. Describe the properties of liquids, nature of matter and periodic properties of some of elements

CO-2. Explain the basic concepts of orbitals based on rules for filling up of electrons in orbitals, thermodynamics, qualitative and quantitative analysis, chemistry of aliphatic and aromatic hydrocarbons, Introduction of chemical bonding.

CO-3. Identify the factors affecting properties of liquids, alkanes, alkenes, alkynes, cycloalkanes and aromatic hydrocarbons and their stereochemistry, limitations of first law of thermodynamics and surface tension

CO-4. Relate the temperature dependence of the change in internal energy of a reaction to the difference in isochoric heat capabilities of reactions to temperature, properties of beryllium and aluminium

CO-5. Determine the effective nuclear charge and electronegativity of atoms, surface tension of liquids and assess the stability of orbitals

CO-6. Conduct experiments as per the standard procedures and tabulate the measured values, calculate the limiting reagent, theoretical yield, and percent yield

Dean
Faculty of Engineering and Technology
M.S. Ramaiah University of Applied Sciences
Bangalore-560058

Course Outcomes (COs)

Course Title & Code: Mathematics – 1 (MTC111A)

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

- **CO-1.** Explain the principles of differential and integral calculus of multivariate functions
- **CO-2.** State and prove important theorems such as Rolle's theorem, Lagrange and Cauchy mean value theorem, Taylor's theorem and Euler's theorem
- **CO-3.** Solve simple mathematical problems associated with differential and integral calculus of multivariate functions
- **CO-4.** Apply differential and integral calculus to model real world problems
- **CO-5.** Solve complex real world problems associated with differential and integral calculus of multivariate functions

Course Outcomes (COs)

Course Title & Code: Introduction to Statistics and Probability (STC111A)

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

- **CO-1.** Explain the basic definitions, importance and significance of statistics and probability in data analysis and quantification of randomness
- **CO-2.** State and prove the important theorems in central tendency, dispersion, and probability
- **CO-3.** Solve simple problems using measures of central tendency, dispersion, probability and univariate random variables.
- **CO-4.** Model and solve the real world problems using univariate and bivariate random variables
- **CO-5.** Solve complex problems arising in real world involving data analysis, univariate and bivariate random variables.

Course Outcomes (COs)

Course Title & Code: English for Communication 1 (TSM101A)

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

- **CO-1.** Identify the nuances of communication skills
- **CO-2.** Apply the concepts of grammar in written communication
- **CO-3.** Apply professional etiquette as appropriate
- **CO-4.** Practice extempore and basic conversation skills
- **CO-5.** Practice comprehension skills
- **CO-6.** Compose precise paragraphs as per the given topic

Course Outcomes (COs)

Course Title & Code: Introduction to Scientific Programming (MTM101A)

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

- **CO-1.** Perform basic operations in MATLAB
- **CO-2.** Plot graphs using MATLAB built-in commands
- **CO-3.** Write and execute programs using MATLAB
- **CO-4.** Solve simple mathematical problems and compare the results with that of solutions

obtained using MATLAB

CO-5. Solve complex real world mathematical problems and compare the results with that of solutions obtained using MATLAB

CO-6. Perform basic operations in MATLAB

Course Outcomes (COs)

Course Title & Code: Electricity and Magnetism (PYC112A)

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

CO-1. Explain the basic laws of electricity and magnetism

CO-2. Describe dielectric properties of matter relevant to electricity

CO-3. Formulate the expression relevant to electricity and magnetism

CO-4. Apply principles of electromagnetism in various practical applications

CO-5. Solve relevant problems on electricity and magnetism

Course Outcomes (COs)

Course Title & Code: Fundamentals of Chemistry-2 (CYC121A)

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

CO-1. Explain the physical and chemical properties of noble gases, transition elements and coordination compounds, VSEPR theory, Clausius-Clapeyron equation, Collision theory of reaction rates, and chemistry of oxygen containing functional groups

CO-2. Discuss the phase equilibria of one and two component system, chemical kinetics of the reactions, stereochemistry of coordination complexes and organic compounds, stability of various oxidation states

CO-3. Discuss the chemistry of aromatic compounds, isomerism in organic and inorganic compounds, Electrophilic aromatic substitution in aromatic compounds and apply Hückel's rule to find the aromaticity

CO-4. Derive the expressions for first and second order rate equations, and discuss the industrial applications of oxygen containing functional groups.

CO-5. Conduct experiments as per the standard procedures and tabulate the measured values, calculate the limiting reagent, theoretical yield, and percent yield

Course Outcomes (COs)

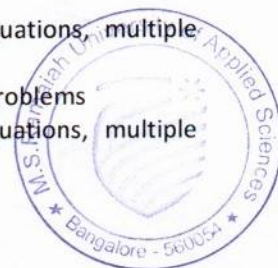**Course Title & Code: Mathematics – 2 (MTC121A)**

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

CO-1. Explain the principles of differential equations, multiple integrals, numerical analysis and complex analysis

CO-2. State and prove important theorems such in differential equations, multiple integrals, numerical analysis and complex analysis

CO-3. Solve simple mathematical problems associated with differential equations, multiple integrals, numerical analysis and complex analysis

CO-4. Apply differential equations and multiple integrals to model real world problems

CO-5. Solve complex real world problems associated with differential equations, multiple integrals, numerical analysis and complex analysis

Dean
Faculty of Engineering and Technology
M.S. Ramaiah University of Applied Sciences
Bangalore-560058

Course Outcomes (COs)

Course Title & Code: Probability Distributions (STC121A)

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

CO-1. Explain the concepts of random variables, probability distribution of random variables, joint probability distribution.

CO-2. State and prove the important theorems in probability distributions and correlation and regression.

CO-3. Solve simple problems associated with univariate and bivariate random variables, probability distributions, correlation and regression.

CO-4. Model and solve the real world problems associated with univariate and bivariate random variables.

CO-5. Solve complex problems associated with univariate and bivariate random variables, probability distributions, correlation and regression analysis.

Course Outcomes (COs)

Course Title & Code: Environmental Studies (BTN101A)

After undergoing this course students will be able to:

CO-1. Illustrate the multidisciplinary nature of environmental studies and recognize the need for public awareness

CO-2. Explain the various natural resources and their associated problems, ecosystem, and environmental pollution

CO-3. Analyse the concept of ecosystem and classify various types

CO-4. Compare biodiversity at local, national and global levels

CO-5. Discuss various social issues pertaining to environment including sustainable development and energy issues

<div align="center">

***

</div>

Registrar
M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054

Dean
Faculty of Engineering and Technology
M.S. Ramaiah University of Applied Sciences
Bangalore-560058