ARUMUGAM PILLAI SEETHAI AMMAL COLLEGE
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Tiruppattur – 630 211.

B.Sc., Mathematics Programme

Programme Outcome (POs) :

➢ PO-1. Help the students to enhance their knowledge in soft skills and Computing skills.
➢ PO-2. Enable the students to equip knowledge in various concepts involved in algebra, differential equations and graph theory.
➢ PO-3. Enable the students to acquire knowledge in C programming.
➢ PO-4. Students are trained in an effective manner to attend the competitive exams in order to brighten their future.
➢ PO-5. Facilitate students to acquire a flair knowledge in discrete mathematics, real analysis and solve problems efficiently.

Programme Specific Outcome (PPOs):

➢ PSO-1. To provide the student with pertinent information in the field of Mathematics.
➢ PSO-2.To teach the student with a broad understanding of Mathematical and their interactions with the Equations.
➢ PSO-3.To learn to apply mathematics to real life situations and help in problem solving
➢ PSO-4.The students will learn functions of real and complex variables, different types of integration.
➢ PSO-5. The students can solve various constrained and unconstrained problems in single variable as well as multivariable.
➢ PSO-6. Also by the understanding of Numerical Analysis they will ready to develop computational skill to solve science and engineering problems

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Calculus-7BMA1C1 :
Course Description:
This course is intended to develop practical skills in differential calculus and Integral calculus

Course Objectives
1. Know to find higer derivatives and expand the given function and know about envelope, curvature and evolute of a curve.
2. Accure knowledge about p – r equation of curve, asymptotes and radius of curvature in polar co – ordinates.
3. Expose to definite integrals and their properties, reduction formulae and Bernoulli's formula.
4. Know about double and triple integral and their properties, Jacobian.
5. Be familiar with Beta and Gamma functions.

Course Outcome (COs)
1. Evaluate higer derivatives and expand the given function and find envelope, curvature and evolute of a given curve.
2. Find the radius of curvature, p – r equation of curve, asymptotes and radius of curvature in polar co – ordinates.
3. Evaluate definite integrals and integrate a given function by integration by parts and Bernoulli's formula.
4. Find double and triple integral and their properties, Jacobian.
5. Do problems Beta and Gamma functions.

Algebra and Trigonometry 7BMA1C2

Course Objectives
To present a rigorous development of Number Theory using axioms, definitions, examples, theorems and their proofs

Course Outcome (COs)
1) effectively express the concepts and results of Number Theory.
2) construct mathematical proofs of statements and find counterexamples to false statements in Number Theory.
3) collect and use numerical data to form conjectures about the integers.
4) understand the logic and methods behind the major proofs in Number Theory.
5) work effectively as part of a group to solve challenging problems in Number Theory

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Properties of Matter, Thermal Physics and Optics (4BPHA1)

Course Objectives
- ϖ To introduce the concept of elastic moduli.
- ϖ To give the exposure of Moment of inertia.
- ϖ To understand the concept of viscosity and Bernoulli's theorem.
- ϖ To make the students to learn about the conduction, convection and Radiation.
- ϖ To understand the concept of Thermodynamic laws.
- ϖ To enable the students to learn about the interference, diffraction and polarization

Course Outcome (COs)
- ϖ Acquire the knowledge in different elastic moduli of the materials.
- ϖ Ability to understand the application of Poiseuille's formula and Bernoulli's equation.
- ϖ Thorough knowledge in stream lined motion and turbulent motion.
- ϖ Enable to calculate the thermal conductivity of the bad conductor using Lee's disc method.
- ϖ Practice to derive the Rayleigh jeans law and Wien's laws from Planck's law.
- ϖ Arrive the Carnot's cycle condition for heat engine and cold engine.
- ϖ Thorough knowledge in fundamental principles of thermodynamics.
- ϖ Application of interference, diffraction and polarization.

422E Prose Extensive Reading and Communication Skills

Course Objectives
1. Critical thinking, to analyse, evaluate, and synthesis the information he has gathered in from the lecture.
2. Communication, to effectively interpret and express his ideas through written and spoken.
3. To inculcate Social Responsibility about civic responsibility, and adjust with regional, national and global communities.

Course Outcome (COs)
a. Speak and write in English for Global competency.
b. Will be able to analyze literary works (prose and short stories).
c. They will also be exposed to basic literary genres of prose and short stories
d. Grammar, reading and writing exercises will make the student to read any text and understand it and make them to think beyond the text.
e. Compositions give space for more writing skills. They will help the student to write essays, and reports. Thereby they will be able to differentiate objective and subjective writing.

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INTEGRAL CALCULUS AND FOURIER SERIES - 7BMA2C1

Course Description:

This course in calculus is intended to develop practical skills in integral calculus and Fourier series. As well, it is intended to illustrate various applications of calculus to technical problems. Methods of algebraic integration will be introduced, with both definite and indefinite integrals being determined for a variety of functions. The use of tables of integrals for finding solutions for difficult integrals will be introduced. Various applications of integration will be studied including Fourier series. And in particular about,

• Definite Integrals and their properties, the Fundamental Theorems of Calculus, substitution, integration by parts, other methods of integration, numerical techniques.

• Reduction formula for Sinn x, cosn x, tann x, sinmxcosn x – Bernoulli's formula

• Beta and Gamma Integrals – Properties and Problems

• Fourier series – Expansion of even and odd functions – half range series

• Double integrals – change of variables – Jacobean – Triple integrals

Course Objectives

Integral Calculus and Fourier series is primarily concerned with developing the students' understanding of the concepts of calculus and providing experience with its methods and applications. The course emphasizes a multi representational approach to calculus, with concepts, results, and problems being expressed geometrically, numerically, analytically, and verbally. The connections among these representations are also important

• to introduce the basics of multivariable calculus and Integral Transformers and their applications.

• Understand the meaning of integration and fourier series

• to make the students understand the basic concepts of multiple integrals, vector calculus, and Fourier transformers, Fourier series and their applications in various engineering problems.

• To introduce improper integrals and specially to Beta and Gamma Functions

Course Outcome (COs)

Upon successful completion of this course, the student will have reliably demonstrated the ability to:

• Calculate definite integral values using Beta and Gamma Functions

• define the basic concepts and principles of differential and integral calculus of real functions and sequences and series

• interpret the geometric meaning of differential and integral calculus

• apply the concept and principles of differential and integral calculus to solve geometric and physical problems. organize solving of complex problems by combining the acquired mathematical concepts and principles

• Apply integration to determine volumes, areas, and averages and to produce Fourier series.

• Know how to derive a Fourier series of a given periodic function by evaluating Fourier coefficients

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ANALYTICAL GEOMETRY OF 3D AND VECTOR CALCULUS - 7BMA2C2

Course Objectives

This is a beginning course in plane analytic geometry emphasizing the correspondence between geometric curves and algebraic equations. The course assumes a sound background in analytical geometry, and vector calculus. The Geometry course includes,

• Analysis of plane, solid, coordinate geometry, logic and proof, parallel lines and polygons, perimeter and area analysis, volume and surface area analysis,

• Analysis of Intersection of two lines, coplanar lines Shortest distance, distance between two skew lines, Equation of a sphere Tangent line and tangent plane, section of a sphere problems.

• Includes vector-valued functions, gradient, curl, divergence, vector identities, problems vector fields, line and surface integrals partial derivatives, and the theorems of Green, Gauss, and Stokes, vector operators and the extension of the calculus to the vectors in 3-D space.

Course Outcome (COs)

This course is intended to expose the students to,

• Solve Bisector planes, Perpendicular distance from a point to a plane – Problems.
• Evaluate angle between a line and a plane, length of perpendicular from a point to a line – Shortest distance, distance between two skew lines
• Demonstrate Vectors, gradient, curl, divergence, vector identities, and problems.
• Solve Line integral, surface integral, volume integral.
• Prove Green's Theorem, Stokes theorem, Gauss's Theorem. Statements and verification

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Allied Physics Practical - (7BPHAP1)

Course Objectives
- ϖ To determine the young's modulus of the given material.
- ϖ To find the thickness of the thin wire using Air wedge.
- ϖ To calibrate the given ammeter and voltmeter.
- ϖ To find the number of lines per meter and wavelength of the mercury spectrum.
- ϖ To verify the logic gates using discrete components and ICs.
- ϖ To find the thermal conductivity of the bad conductor using Lees disc method.

Course Outcome (COs)
- ϖ Ability to determine the Youngs modulus of different mateials.
- ϖ Able to calibrate the given ammeter and voltmeter using potentiometer.
- ϖ Acquire the knowledge of interference fringes and measure the bandwidth.
- ϖ Ability to construct the logic gates by using discrete components and ICs.
- ϖ Capable of producing line spectra and measure the diffraction angle by using spectrometer.

ELECTRICITY, ELECTRONICS, ATOMIC AND NUCLEAR PHYSICS - 7BPHA2
Course Description:
The paper titled "Electricity, Electronics, Atomic and Nuclear Physics" is the allied paper for the B.Sc., (Maths) and B.Sc.,(Chemistry) major students. Mathematics major students will study this allied paper in the second semester whereas Chemistry major students will study this allied paper in the fourth semester. This paper has four credits. The students will be examined for 60 marks externally and 15 marks for internally.

Course Objectives
The objectives of the paper "Electricity, Electronics, Atomic and Nuclear Physics" are
- To be familiar with basic definitions in electricity
- To be familiar with basic concepts of electromagnetism
- To be familiar with various atoms model and related phenomenon
- To understand the basic concepts in digital and analog electronics

Course Outcome (COs)
- Enable to understand the concepts of electricity and current flow related bridges
- Enable to understand the concepts of magnetic fields
- Thorough knowledge in the basic concepts of electromagnetic induction
- Application of interference, diffraction and polarization experiments

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Environmental Studies. - (7BES2)

Course Objectives

The course Explore the basics of environmental studies and the unique interdisciplinary methods used to address the most challenging environmental problems. This segment will give to the students a brief overview of types of issues and the solutions examined within environmental studies. Course Objective:

• Creating the awareness about environmental problems among to the students.
• Imparting basic knowledge about the environment and its allied problems.
• Examine the Renewable and Non renewable resources.
• Motivating students to participate in environment.
• Environmental Study to learn the importance of Eco-system.
• Mention the causes and effect of pollution.

Course Outcome (COs)

Developing an attitude of students for the environment.
☐ Study the importance of Plantation.
☐ The Environmental Studies Program actively cultivates in our students for environmental issues.
☐ Acquiring skills to help the concerned individuals in identifying and solving environmental
problems.
☐ Striving to attain harmony with Nature.

Poetry Drama and Communication Skills - (732E)

Course Objectives

a) Speak and Write in English
b) to analyse literary works
c) They will be exposed to basic literary genres of prose and poetry

Course Outcome (COs)

After completing the course, Students will be able to
a) Grammar, Reading and Writing exercises will make the students read any text
b) Composition practice will help the student to write essays

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MODERN ALGEBRA - 7BMA3C1

Course Description:

In this course, we will study algebraic structures that are fundamental to almost all branches of mathematics and to other fields of study such as physics, chemistry, and computer science. Modern Algebra covers group theory, including finite groups, subgroups, cyclic groups, permutation groups, group isomorphism, and cosets, and introduces rings and fields, including integral domains, polynomial rings, unique factorization domains and Euclidean domains. This course will also focus on understanding and writing proof

Course Objectives

- Present the relationships between abstract algebraic structures with familiar numbers systems such as the integers and real numbers.
- Present concepts of and the relationships between operations satisfying various properties (e.g. commutative property).
- Present concepts and properties of various algebraic structures.
- Use results from elementary group theory to solve contemporary problems;
- Explain from elementary principles why certain algebraic facts are true.

Course Outcome (COs)

- Students will have a working knowledge of important mathematical concepts in abstract algebra such as definition of a group, order of a finite group and order of an element.
- Students will be knowledgeable of different types of subgroups such as normal subgroups, cyclic subgroups and understand the structure and characteristics of these subgroups.
- Students will be introduced to and have knowledge of many mathematical concepts studied in abstract mathematics such as permutation groups, factor groups and Abelian groups.
- Students will gain experience and confidence in proving theorems. A blended teaching method will be used requiring the students to prove theorems give the student the experience, knowledge, and confidence to move forward in the study of mathematics.
- Analyze and demonstrate examples of subgroups, normal subgroups and quotient groups,
- Analyze and demonstrate examples of ideals and quotient rings,
- Use the concepts of isomorphism and homomorphism for groups and rings

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DIFFERENTIAL EQUATIONS AND ITS APPLICATIONS - 7BMA3C2
Course Description:
This course provides an introduction to topics involving
• ordinary differential equations. Emphasis is placed on the development of abstract concepts and applications for first-order and linear higher-order differential equations,.
 Exact differential equations –Clairaut's equation – Second and higher order linear Differential equations with constant Coefficients. Homogeneous linear Equations with variable coefficients
• Method of reduction and variation of parameters –Necessary and Sufficient condition of integrability of Pdx+Qdy +Rdz = 0 – Rules for solving it.

Course Objectives
learning differential equations is certainly one of the goals of this course, the purpose of this module is to provide participants with the skills, knowledge and attitudes required to solve differential equations
• Identify essential characteristics of ordinary differential equations.
• Explore the use of differential equations as models in various applications
• classify differential equations by order, linearity, and homogeneity
• solve first order linear differential equations
• solve linear equations with constant coefficients
• use separation of variables to solve differential equations
• solve exact differential equations
• use variation of parameters to solve differential equations
• Laplace transforms and their inverses to solve differential equations
• solve systems of linear differential equations using matrix techniques and eigenvalues
• use numerical methods to solve differential equations

Course Outcome (COs)
On completion of this module the learner should be able to:
• Find general solutions to first-order, second-order, and higher-order homogeneous and nonhomogeneous differential equations by manual and technology-based methods.
• Determine solutions to first order exact differential equations,Clairaut's equation.
• Determine solutions to second order linear homogeneous differential equations with constant coefficients.
• Determine solutions to second order linear non-homogeneous differential equations with constant coefficients
• Determine solutions to Partial Differential Equations – Formation of P.D.E. by the elimination of constants –Lagrange's method – Charpit's method
• Select and apply appropriate methods to solve differential equations; variation of parameters, LaPlace and inverse LaPlace transforms

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PROGRAMMING IN C (THEORY & LAB) - 7BCEA3

Course Description:

This C programming course provides a comprehensive introduction to the ANSI C language, emphasizing portability and structured design. Comprehensive examples are integrated throughout to reinforce learning

Course Objectives

Students will be exposed to C Programming language. They will learn syntax and semantics in C language. Students are introduced to fundamental data types, flow control, and standard function libraries. Thorough treatment is given to the topics of string and character manipulation, dynamic memory allocation, standard I/O, macro definition, and the C runtime library. The course explains the use of structures, unions, and pointers. Structured programming constructs and various functions are also covered. Emphasis is given to the processing of command line arguments and environment variables so students will be able to write flexible, user-friendly programs. They will also learn to solve problems using various programming logic and various file types.

Course Outcome (COs)

Students completing the course will be able to

CO1. Develop their skill in C programming language.

CO2. Understand the basic concepts of program development statements and its syntax.

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CO3. Understand the various types of arrays.

CO4. Know about the various types of Functions and String handling mechanisms.

CO5. Really Understand the Concepts of structures and Unions.

CO6. Illustrates the various operations performed on different types of data files.

COMPETITIVE EXAMINATIONS SKILLS – 7SBS3A1

Course Description:

Students are expected to develop the skill of creativity, numerical ability to have a better job

Course Objectives

STUDENTS COMPLETING THE COURSE WILL BE ABLE TO:

1. Develop the art of speaking to have a fluency in language

2. Know the various type of inductive reasoning to develop the individual memory.

3. Developing the verbal skill of an individual.

4. Analyze the various test of an individual.

5. Prompt thought to have a overall development in an individual.

6. Understanding Analytical Method which are essential for the development of an individual.

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EFFECTIVE EMPLOYABILITY SKILLS - 7NME3C

Course Description:
Students will be exposed to have employment which are the basics of life to have income which lead to higher standard of living.

Course Objectives
Students completing the course will be able to,
1. Fill the job application form while they are approaching for the job without others help.
2. Know the frequently asked question in the interview.
3. The rules to be followed while facing the interview.
4. Steps to be followed in group discussion with the management.
5. Leadership qualities that are needed for the growth of inculcating the characteristics of the leader.

Course Outcome (COs)
The above two books are prescribed texts for first two semester. The course objectives of the above prescribed text are,
1. Critical thinking about how to face the interview.
2. Analytical skill to develop the art to face the interview

Shakespeare and English for Competitive Examinations(742E)

Course Description:
To enable the learners become proficient users of English involving all the skills, so that the students confidentially face competitive examinations and come out successfully.

Course Objectives
1. To impart specific training necessary for writing competitive examinations.
2. To facilitate effective communication in English.
3. To familiarize the learners with the use of technology for writing the exams
4.To make the students understand and relish the great works of Shakespeare

Course Outcome (COs)
Abilities Developed: 1. Usage of appropriate vocabulary in appropriate contexts, identifying unnecessary words and sentence structure, critical analysis, summarizing skills and identifying the tone. 2. Fluency in English, precise and correct use of English language, building confidence in handling English language

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SEQUENCES AND SERIES - 7BMA4C1

Course Description:

This course will introduce students to a variety of new techniques of infinite series, and to sequences and series. Students will be expected both to become proficient with basic skills and to demonstrate an understanding of the underlying principles of the subject. • Sequences:, Convergence, divergence. Oscillation, Monotonic and bounded sequences, subsequence and Cauchy sequence. algebra of limits. Behaviour of Geometric sequence. • Infinite series: Series of positive terms cauchy's general principle of convergence, comparison test , Harmonic series Σ $1/np$ • Kummer's test, Raabe's test ,D' Alembert'sratio test, cauchy's root test ,Gauss test and Problems • Cauchy condensation test, cauchy's integral test Alternating series,Absolute convergence ,conditionally convergence ,Leibnitz's test and Problems.

Course Objectives

The aim of this course is to develop an understanding of convergence in its simplest setting. And also to learn about
• The difference between a sequence and a series in the mathematical context.
• The convergence/divergence of a series so we will give the basic ideas and definitions in this section.
• Using the Integral Test, Comparison Test, Limit Comparison Tests, Alternating Series Test, Ratio Test and Root Test to determine if a series converges or diverges.
• A brief discussion on absolute convergence and how it differs from convergence.
• A set of general guidelines to use when deciding which test to use.

Course Outcome (COs)

By learning this course students will be able to
• Evaluate the limit of a sequence • Evaluate the limit of an infinite series
• Determine the monotonic and bounded sequences.
• Test the convergence of an infinite series
• Represent a function as a power series
• Represent a function as a infinite series
• Use series in application problems

LINEAR ALGEBRA - 7BMA4C2

Course Description:

This course covers matrix theory and linear algebra, emphasizing topics useful in other disciplines. Linear algebra is a branch of mathematics that studies systems of linear equations and the properties of matrices. The concepts of linear algebra are extremely useful in physics, economics and social sciences, natural sciences, and engineering. Due to its broad range of applications, linear algebra is one of the most widely taught subjects in college-level mathematics

Course Objectives

Understand real vector spaces and subspaces and apply their properties. Understand linear independence and dependence.
● Find basis and dimension of a vector space, and understand change of basis.

● Compute linear transformations, kernel and range, and inverse linear transformations, and find matrices of general linear transformations.

● Find the dimension of spaces such as those associated with matrices and linear transformations.

● Find eigenvalues and eigenvectors and use them in applications.

● Compute inner products on a real vector space and compute angle and orthogonality in inner product spaces

Course Outcome (COs)

Use computational techniques and algebraic skills essential for the study of systems of linear equations, matrix algebra, vector spaces, eigenvalues and eigenvectors, orthogonality and diagonalization.

● Use visualization, spatial reasoning, as well as geometric properties and strategies to model, solve problems, and view solutions, especially in R2 and R3 , as well as conceptually extend these results to higher dimensions.

● Critically analyze and construct mathematical arguments that relate to the study of introductory linear algebra.

● Communicate and understand mathematical statements, ideas and results, both verbally and in writing, with the correct use of mathematical definitions, terminology and symbolism.

● Work collaboratively with peers and instructors to acquire mathematical understanding and to formulate and solve problems and present solutions.

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PROGRAMMING IN C AND C++ LAB - 7BCEAP2

Course Description:

This C and C++ programming lab course provides hands on training in ANSI C language. Comprehensive hands on exercises are integrated throughout to reinforce learning and develop real competency. The C and C++ Lab course provides hands on training to students. The list of program are integrated throughout to reinforce learning and develop real competency.

Course Objectives

This course objective is to write, compile, debug and execute C and C++ programs, to formulate problems and implement algorithms and to effectively choose programming components that efficiently solve computing. The list of C Programs are to find the is odd or even , sum of digits, Armstrong number, Prime number, perfect number, palindrome, simple and compound interest , sorted array, Counting positive, negative and zeros. Students will be exposed to C++ Programming language. They will learn syntax and semantics of statements in C++ computer programming language. They will also learn to solve problems in Object oriented ways i.e., bottom approach. The list of C++ programs are to evaluate STD, Farenheit to Celsius, Sum of digits using constructor, employee paybill, adding and multiplying complex numbers using operator over loading, student mark list, to find volume using inline function and to apply Multiple inheritance and Hierarchical inheritance. Students come with their developed programs to their lab session. They have to enter, compile, link and execute two programs in their lab session. They have to correct the syntax error, logical errors, input errors and output errors. Students are assessed by formative and summative assessment and examinations.

Course Outcome (COs)

CO1. Use Arrays and Functions in programs.
CO2. Use pointers, structures and files handling.
CO3. Develop their skill in executing C programs.
CO4. Construct the flowchart to solve mathematical and scientific problems.
CO5. Use the features of C++ using object oriented programming.
CO6. Use encapsulation and inheritance.
CO7. Develope programs in C++ Using polymorphism.
CO8. Use the advanced features of C++ specifically stream I/O and operator overloading.
CO9. Design and test programs to solve mathematical and scientific problems using object oriented concepts.

PROGRAMMING IN C++ (THEORY & LAB) - 7BCEA4

Course Description:

Students will be exposed to C++ Programming language. The C++ programming course provides an accelerated introduction to the most essential syntactical components of the C and C++ language, focus on object-oriented programming with C++. Comprehensive examples are integrated throughout to reinforce learning and develop real competency.

Course Objectives

Students will learn syntax and semantics of statements in C++ language. The course begins by introducing the built in data types, fundamental control constructs, and rich expression operator repertoire common to both C and C+. The central concepts of C++ syntax and style are taught in the context of using object-oriented methods to achieve reusability, adaptability and reliability. Emphasis is placed on the features of C++ that support abstract data types, inheritance, and polymorphism. Students will learn to apply the process of data abstraction and class design. Practical aspects of C++ programming including efficiency, performance, testing, and reliability considerations are stressed throughout. They will also learn to solve problems in using object oriented approach.

Course Outcome (COs)

CO1. Explain the top-down and bottom-up programming approach and apply bottom up approach to solve real world problems.

CO2. Explain the difference between static and dynamic binding.

CO3. Describe the concept of inheritance, overloading, constructors and apply real world problems.

CO4. Discuss the generic data type for the data type independent programming which relates it to reusability.

CO5. Explain to design of handling large data set using File I/O.

CO6. Develop their skill in C++ programming language

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MODERN ANALYSIS - 7BMA5C1

Course Description:
The course will cover the topics contained in the five units of the syllabus. Several additional topics will also be covered and the presentation will not necessarily follow the text. Attendance is required and the exams will be over the lectures and homework. The course topics include:

- countable and uncountable sets inequalities of holder and minkowski-
- metric space and subspace
- Completeness intersection theorem-baire category theorem.
- Continuity uniform continuity
- Connectedness and continuity - intermediate value theorem.
- Characterization for compactness - continuity and compactness

Course Objectives
This course is intended to expose you to the basic ideas of Modern Analysis. In particular to learn about

- basic properties of the field of real numbers.
- the series of real numbers and convergence.
- Open and Closed Sets of Real Numbers Compact, Perfect and Connected Sets The Intermediate Value Theorem
- Definitions, theorems, techniques etc… these are your mathematical tools and as a bare minimum you have to know what they are.
- continuity of a function and uniform continuity of a function
- To prove various theorems about continuous functions and emphasize the proofs' development

Course Outcome (COs)
After completion of course, the students will be able to

- Define and recognize the basic properties of the field of real numbers
- Improve and outline the logical thinking.
- prove a basic set theoretic statement
- prove a theorem about continuous functions
- Give the definition of concepts related to metric spaces, such as continuity, compactness, completeness and connectedness
- Understand and perform simple proofs
- apply critical thinking skills to solve problems that can be modeled mathematically.

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EMERGENCY AND MEDICAL LAB SKILLS - 7SBS4B2

Course Description:
The course is designed to provide understanding about different types of emergencies and the required medical skills to be given to the people being affected.

Course Objectives
1. To prepare the students to rise to the occasion of emergencies.
2. To provide the medical lab skills to those people affected by natural and other situations.

Course Outcome (COs)
1. provide knowledge and skills to rescue people affected by fractures fire Snake bite road and bite and heat stroke and those people affected by the diseases like diarrhoea and dysentery.
2. Introduces the traffic rules and precautions to be followed during the Travels along the roads.
3. Introduces the basic knowledge about medical lab tests for the human beings
4. Use knowledge about treating different types of diseases by using locally available Herbals.
5. The project work given to the students main provide them chances to learn B.Sc.,Mathematics about different types of diseases and the methods of curing Dum by using native treatments.

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MANAVALAKALAI YOGA - 7BMY4
Course Description:
It provides a thorough arena for meditation, yoga and physical exercise which leads to holistic health that totally transforms a person.

Course Objectives
1. Understand the health concepts and the different aspects of physical body.
2. Have the basic knowledge on simplified physical exercise and asanas.
3. Introspect and improve the behaviour of an individual.
4. Understand how to improve concentration and focus.
5. Improve intellectual sharpness.

Course Outcome (COs)
1. To enhance soft skills and develop the ability for an efficient management in their field chosen.
2. Inculcates the social responsibility, to realize the enduring values of peace, NonViolence and hormone to revitalize human society for restoring its sanity and strength.

WOMEN STUDIES - 7BWS4

Course Description:
The students will be exposed to gender identity, gender equality, role of gender in different aspects, capacity of women and the various schemes and programmes implemented for women empowerment

Course Objectives
1. Explain the concepts of socialisation and internalisation and gain knowledge on gender ideology.
2. Understand the role of women in various capacity and how she balances both work and family efficiently.
3. Explain the different indexes such as HDI, GDI, GEM and participation of women in decision making and the political arena.
4. Explain physical and biological differences of gender in sports and the mental ability of women in handling emotions.
5. Understand the different policies, welfare schemes and programmes introduced by the central and state government.
6. Explain the concepts, levels and tools of women empowerment.

Course Outcome (COs)
Inculcates social responsibility by imparting the role of women to the stakeholders and play active role in empowering women to have a balanced development.

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B.Sc., Mathematics Programme

Modern Analysis - (7BMA5C1)

Course Description:

The course will cover the topics contained in the five units of the syllabus. Several additional topics will also be covered and the presentation will not necessarily follow the text. Attendance is required and the exams will be over the lectures and homework. The course topics include:

• countable and uncountable sets inequalities of holder and minkowski-

• metric space and subspace

 • Completeness intersection theorem-baire category theorem.

• Continuity uniform continuity

• Connectedness and continuity - intermediate value theorem.

• Characterization for compactness - continuity and compactness

Course Objectives

his course is intended to expose you to the basic ideas of Modern Analysis. In particular to learn about

• basic properties of the field of real numbers.

• the series of real numbers and convergence.

• Open and Closed Sets of Real Numbers Compact, Perfect and Connected Sets The Intermediate Value Theorem

• Definitions, theorems, techniques etc… these are your mathematical tools and as a bare minimum you have to know what they are.

• continuity of a function and uniform continuity of a function

• To prove various theorems about continuous functions and emphasize the proofs' development

Course Outcome (COs)

• Define and recognize the basic properties of the field of real numbers

• Improve and outline the logical thinking.

• prove a basic set theoretic statement 312 B.Sc.,Mathematics

• prove a theorem about continuous functions

• Give the definition of concepts related to metric spaces, such as continuity, compactness, completeness and connectedness

• Understand and perform simple proofs

• apply critical thinking skills to solve problems that can be modeled mathematically.

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MATHEMATICAL STATISTICS - 7BMA5C2

Course Description:
This course is an introduction to probability density function, probability distribution, test of signification, analysis of varience and Latin square design.

Course Objectives
On completion of this course the learner will
1. know about p.d.f of a random variable, expectation and moment generating function of variable.
2. have knowledge in binomial, poisson, normal distribution.
3. know the methods to test the hypoyhesis for large samples.
4. know the methods to test the hypoyhesis for small samples.
5. expose to chi-square distribution, analysis of variance.

Course Outcome (COs)
1. evaluate p.d.f of a discrete and continuous random variable, expectation and moment generating function of discrete and continuous of variable.
2. do problems using binomial, poisson, normal distribution.
3. test the null hypoyhesis for large samples.
4. test the null hypoyhesis for small samples.
5. do problems in analysis of variance: one way classification, two way classification and the Latin square.

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STATICS - 7BMA5C3
Course Description:
The course covers the following topics; statics of particles: forces in plane, forces in space, equilibrium, moment of a force, moment of a couple, equivalent systems of forces on rigid bodies, equilibrium in two dimensions, equilibrium in three dimensions, distributed forces: centroids and center of gravity, analysis of structures: trusses, frames and machines, internal forces in beams and cables, friction, moments of inertia of areas, moments of inertia of masses, method of virtual work.

Course Objectives
1) To provide definition of force and moment vectors and give necessary vector algebra
2) To explain the concept of equilibrium of particles and rigid bodies in plane and 3D space
3) To give information about support types and to give ability to calculate support reactions
4) To explain the equilibrium of structures and internal forces in trusses, and frames

LINEAR PROGRAMMING - 7BMA5C4
Course Description:
Operations Research is the study of scientific approaches to decision-making. Through mathematical modeling, it seeks to design, improve and operate complex systems in the best possible way. And also, introduce the students to the advanced methods for large-scale transportation and assignment problems. The goal of this course is to teach to formulate, analyze, and solve mathematical models that represent real-world problems.

Course Objectives
Formulate a real-world problem as a mathematical programming model
● Understand the theoretical workings of the simplex method for linear programming and perform iterations of it by hand
● Understand the relationship between a linear program and its dual, including strong duality and complementary slackness
● Solve specialized linear programming problems like the transportation and assignment problems

Course Outcome (COs)
● explain the meaning of operations research
● know the various techniques of operations research;
● select an optimum solution with profit maximization;
● Identify and develop operational research models from the verbal description of the real system.
● Develop a report that describes the model and the solving technique, analyse the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.

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GRAPH THEORY - 7BMAE1A

Course Description:

The course covers basic theory and applications of combinatory and graph theory. Combinatory is a study of different enumeration techniques of finite but large sets. Topics that will be studied include principle of inclusion and exclusion, generating functions and methods to solve difference equations. Graph theory is a study of graphs, trees and networks. Topics that will be discussed include Euler formula, Hamilton paths, planar graphs and coloring problem; the use of trees in sorting and prefix codes; useful algorithms on networks such as shortest path algorithm, minimal spanning tree algorithm and minflow max-cut algorithm. Course Objectives: The successful student will know the definitions of relevant vocabulary from graph theory and combinatory, and know the statements and proofs of many of the important theorems in the subject, and be able to perform related calculations

Course Objectives

The successful student will know the definitions of relevant vocabulary from graph theory and combinatory, and know the statements and proofs of many of the important theorems in the subject, and be able to perform related calculations.Goals of the Course: • gain an understanding of the fundamental concepts of graph theory, • gain an understanding of when a graph is a useful mathematical tool to solve problems in mathematics, the sciences and the environment, • develop the ability to write a logical and coherent proof, including proof by contradiction and induction, • introduce topics suitable for a senior thesis (and see ones that have been), • develop a desire for further study in related areas, including combinatorics and computer science.

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HERITAGE AND TOURISM - 7SBSA4

Course Description:
This course covers the Importance of Tourism and inter-linkage factors between Heritage and tourism.

Course Objectives
1. To illustrate the complexity of "heritage" and heritage tourism;
2. Students will learn the tourist places in regional, state level and national level
3. To outline the challenges of conserving, managing and marketing heritage tourism;
4. Inculcate and mindset creation to go around the tourist places to enrich their knowledge on cultural and linguistic integration.
5. Speak and write other Indian languages for national competency, for that tourism will motivate the students.
6. Will be able to get new innovative ideas to promote tourism by attracting even foreign tourists.

Course Outcome (COs)
This course will bring national integration through tourism. Students will turn into broad minded humans and social reforms, also economic development will be enhanced

MARKETTING AND SALES MANAGEMENT - 7SBS5A5

Course Description:
This course is meant to be an introduction to a career in sales. Despite the "sales" focus, students can find significant value in the sales techniques for many other elements of their lives, from leadership and management to career-building concepts such as interviews

Course Objectives
1. Recognize the key drivers of change in selling and sales management. 2. Understand the best practices in selling that lead to exceeding customer expectations. 3. Explain the historical basis for stereotypical views of selling in society. 4. Identify and explain key success factors for salesperson performance. 5. Discuss and give examples of different types of selling jobs. 6. List and explain the role of various participants in an organizational buying center

Course Outcome (COs)
This course is designed to provide students with an understanding of the processes involved in personal selling and sales management.

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COMPLEX ANALYSIS - 7BMA6C1

Course Description:

This course is an introductory course on Complex Analysis. It is designed for students in Mathematics disciplines. It may, however, be useful to students in engineering and other related fields. It introduces students to the complex numbers system and varieties of operations, analyses and problems that may arise within the context. It also equips the students with mathematical techniques and skills to handles such cases. Topics to be covered in this course includes: Introduction to complex number system, Limits and Continuity of Complex variable functions, Derivation of the Cauchy –Riemann"s Equation, Analytic functions. Harmonic functions, Bilinear transformation, Conformal mapping, Contour Integrals, Convergence of a sequences and series of function of Complex variable. Complex numbers, the topology of the complex plane, the extended complex plane and its representation using the sphere. Complex functions and their mapping properties, their limits, continuity and differentiability, analytic functions, analytic branches of a multiple valued function. Complex integration, Cauchy's theorems, Cauchy's integral formulae. Power series, Taylor's series, zeroes of analytic functions, Rouche's theorem, and open mapping theorem. Mobius transformations and their properties. Isolated singularities and their classification, Laurent's series, Cauchy's residue theorem, the argument principle

Course Objectives

: Demonstrate skills in communicating mathematics orally and in writing.
- Upon successful completion of this course, the student will be able to:
- justify the need for a Complex Number System and explain how is related to other existing number systems
- define a function of complex variable and carry out basic mathematical operations with complex numbers.
- know the condition(s) for a complex variable function to be analytic and/or harmonic

State and prove the Cauchy Riemann Equation and use it to show that a function is analytic.

- define singularities of a function, know the different types of singularities, and be able to determine the points of singularities of a function.
- explain the concept of transformation in a complex space (linear and non-linear) and sketch associated diagrams.
- understand the concept of sequences and series with respect to the complex numbers system and establish whether a given series/ sequences is convergent/ divergent at a specified point or interval.

Course Outcome (COs)

Demonstrate understanding of the basic concepts underlying complex analysis. Demonstrate familiarity with a range of examples of these concepts. Prove basic results in complex analysis. Apply the methods of complex analysis to evaluate definite integrals and infinite series. Demonstrate understanding and appreciation of deeper aspects of complex analysis such as the Riemann Mapping theorem.

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B.Sc., Mathematics Programme

OPERATIONS RESEARCH - 7BMA6C2

Course Description

Operations research (OR) has many applications in science, engineering, economics, and industry and thus the ability to solve OR problems is crucial for both researchers and practitioners. Being able to solve the real life problems and obtaining the right solution requires understanding and modeling the problem correctly and applying appropriate optimization tools and skills to solve the mathematical model. The goal of this course is to teach to formulate, analyze, and solve mathematical models that represent real-world problems.

Course Objectives

- introduce students to the techniques of operations research in mining operations
- provide students with basic skills and knowledge of operations research and its application in mineral industry
- introduce students to practical application of operations research in big mining projects
- And, the subject learning will emphasize the mathematical procedures of nonlinear programming search techniques, probabilistic models in operations research.
- Students successfully completing this course are expected to be able to apply a variety of operations research techniques for solving nonlinear programming problems; to have a good command of probabilistic operations research methods and dynamic programming techniques; and to be familiar with computer software for solving nonlinear programming problems.

Course Outcome (COs)

- formulate and solve problems as networks and graphs.
- solve the problems using special solution algorithms.
- use CPM and PERT techniques, to plan, schedule, and control project activities.
- set up decision models and use some solution methods for nonlinear optimization problems.
- Formulate and analyses the general nonlinear programming problems.
- use some solution methods for solving the nonlinear optimization problems.
- propose the best strategy using decision making methods under uncertainty and game theory and to solve the zero-sum two- person game

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DYNAMICS - 7BMA6C3

Course Description:

Dynamics is the study of motion and force systems on bodies in motion. The course will be an overview of the application of Newton's Laws to rectilinear and curvilinear motion problems. Plane motion, work/energy, impulse/ momentum, force analysis, and mechanical vibration will be studied as well as motivation to understand and analyze linkages.

Course Outcome (COs)

1. Apply analytical skills to solve problems involving motion, force and energy
2. Determine the specific effect of forces on the motion of an element by applying the laws of motion and conservation of energy and momentum.
3. Use dynamics theory in the solution of various engineering problems

FUZZY ALGEBRA - 7BMAE2B

Course Description:

To master the various fundamental concepts of fuzzy logic. This will help the students to get sufficient knowledge on Fuzzy sets. This course introduces students to the basic concepts of
• Extension principle for Fuzzy sets.
 • Operations on Fuzzy sets– Fuzzy complements fuzzy morphisms
• Fuzzy numbers Fuzzy relations – Binary fuzzy relations – Fuzzy equivalence relations.

Course Objectives

• Be able to understand basic knowledge of fuzzy sets and fuzzy logic
 • Be able to apply basic knowledge of eextension principle for Fuzzy sets.
 • Be able to apply basic fuzzy inference and approximate reasoning
• Be able to understand the basic notion of fuzzy rule base
 • Be able to apply basic fuzzy complement
• Be able to apply basic fuzzy relations and inverse relations.
• Be able to understand the basic notion of fuzzy numbers

Course Outcome (COs)

• Understand how fuzzy sets model ambiguity.
 • Manipulate fuzzy membership functions for simple operations.
• Be familiar with the nature and use of fuzzy relations.
• Perform linguistic analysis using fuzzy sets.
• Develop and simulate simple fuzzy numbers
• Familiar with a wide variety of areas in which fuzzy sets may be applied

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NUMERICAL ANALYSIS - 7BMAE3A
Course Description:
This course introduces the theory and application of numerical methods and techniques to interpolate, to evaluate derivatives and integrals from the given data and also to solve difference equation and differential equation.

Course Objectives
1. be introduced to the operators Error! Reference source not found. and E, factorial polynomial and difference of polynomial.
2. learn Newton's forward and backward formulas, Newton's divided difference formula and etc… to interpolate. Also successive approximation.
3. expose to numerical differentions and integration.
4. accure knowledge in summation of series and difference equation.
5. know to solve differential equations by Euler, Taylor and Runge –Kutta methods

Course Outcome (COs)
1. prove the relations between the numerical operators and find the difference of a given polynomials.
2. interpolate using the learnt formulae.
3. find derivatives and integrales from the given data without knowing the function.
4. sum the given series, solve difference equation and differential equation using numerical methods.

BASIC INTERNET AND OFFICE AUTOMATION LAB - 7SBS6B3

Course Description:
Students will get fundamentals of knowledge in MS-Word, MS-Excel, a preparation of power point slides, Internet browsing and application of tools in social science.

Course Objectives
1. MS-Word is introduced in the syllabus to help the students learn typing, alignment, cut, copy, paste etc., of theoretical work
2. MS-Excel is help the students in diagrammatic and statistical representation of data, Drafting documents, preparation of balance sheet accounts etc.,
3. MS- PowerPoint to enhance the knowledge of students in the presentations of slides, flex, animation work etc.,
4. Internet and Browsing to give access to students in downloading reading materials, literature etc., their subject.
5. Statistical Package for Social Science (SPSS) to apply statistical and mathematical tools in the preparation of thesis, dissertation, project etc.,

Course Outcome (COs)
Application of computer knowledge in economics has widened the scope of Economics.
1. Ms-Word and Excel to highly useful in the analysis, evaluation, interpretation and presentation of statistical data collected.
2. Through the knowledge in internet browsing, students can download relevant literature or any study material they need.

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FRUITS AND VEGETABLES PRESERVATION SKILLS - 7SBS6B4

Course Description:
Provides the knowledge related to the various types of vegetables and fruits that could be preserved, the preservation techniques available the related equipment's and methodology

Course Objectives
1. To improve income earning skills through fruits and vegetable preservation.
2. To open up new areas of self-employment opportunities for the youth

Course Outcome (COs)
1. Introduces the principles and method available in the preservation process.
2. Provides knowledge about various types of equipment available and different types of containers that are being used in the preservation process.
3. To introduce various methods available for the preservation of vegetables and fruits. Also gives knowledge related to personal hygiene and the sanitary standards to be followed in the preservation process.
4. Gives the practical knowledge of fruits and their preservation methods.
5. The project work helps the students to know the various centres that are involved in the reservation practices. Also it helps to understand the area specific Technology that could be applied