| Programme Name : B.Sc Mathematics | | Programme Code: SM1 |
|---|---|---|
| **Course Code & Course Name** | **Course Outcomes**<br>**At the end of this course the students will be able to** | **Cognitive Level** |
| **Cognitive Level - Remember - ( R ), Understand - ( U ), Apply - ( P ), Analyse - ( A ), Evaluate - ( E ), Create - ( C )** | | |
| **I Year - I Semester** | | |
| **LA11A - Tamil I** | CO1: இக்கால இலக்கிய வகைகளையும் இலக்கிய வரலாற்றையும் தெரிந்து கொள்வர். | U |
| | CO2: இக்கால இலக்கியங்களைத் துய்க்கும் முறைகளையும், உணர்த்தும் கருத்துகளையும் அறிந்து கொள்வர். | U |
| | CO3: மொழியைத் திறம்படப் பயன்படுத்தும் ஆற்றலைப் பெறுவர். | U |
| **CLK1S - French I** | CO1: Define the overview of the rich French civilisation. | R |
| | CO2: Infer the phrase to write the informal letters. | U |
| | CO3: Make use of the rules of grammar in the phrases. | P |
| **CLE1E - Hindi I** | CO1: Infer the values from the stories and relate them to real life experiences. | U |
| | CO2: Construct official and business correspondence using functional Hindi. | P |
| **CLG1E - Sanskrit I** | CO1: Explain the greatness of epics in Sanskrit literature. | U |
| | CO2: Outline the Sanskrit grammar- Lakaras, Indeclinables and Shabdas. | U |
| | CO3: Explain the literary merit of Raghuvamsa of Kalidasa. | U |
| **LZ11A - Communicative English I** | CO1: Demonstrate the basics of LSRW in real life applications. | U |
| | CO2: Classify American and British vocabulary. | U |
| | CO3: Demonstrate the usage of grammar in written and oral form. | U |
| **SM21A - Algebra** | CO1 : Acquire basic ideas on theory of Equations, Matrices and Theory of Numbers, knowledge to solve theoretical and applied problems. | U |
| | CO2 : Illustrate how to find the polynomial equations and their roots. | U |
| | CO3 : Relate the roots and co.efficients of polynomial equations. | U |
| | CO4 : Demonstrate how infinite series can be summed using Binomial, exponential and logarithmic series. | U |
| | CO5 : Explain certain properties of matrices, eigen values, eigen vectors and Cayley Hamilton Theorem and use them in problems. | U |
| | CO6 : Illustrate problem solving using divisibility, congruences, the Euler's function and the integer part of real numbers. | U |

| Course Code & Course Name | Course Outcomes<br>At the end of this course the students will be able to | Cognitive Level |
|---|---|---|
| **SM21B - Differential Calculus** | CO1: Acquire Knowledge about The basics of differentiation and its applications. The notion of curvature, evolutes, involutes and polar co-ordinates. | U |
| | CO2: Recall Leibnitz's theorem to find the nth derivative of a product of two functions. | R |
| | CO3: Find equations involving derivatives of general order. | R |
| | CO4: Illustrate the method of finding the extremum values. | U |
| | CO5: Find the angle between the tangent and the radius vector at a point on a given curve | R |
| | CO6: Illustrate the different methods of finding the asymptotes. | U |
| **SM3AB - Calculus of Finite Differences and Numerical Analysis-I** | CO1: Acquire knowledgeabout numerical techniques used as powerful tools in scientific computing and Linear algebraic, transcendental equations and interpolation using finite difference formulae. | U |
| | CO2: Illustrate numerical techniques to find the roots of non-linear equations and solutions of system of linear equations. | U |
| | CO3 : Classify the finite difference operators and interpolation formulae and use them in proving some standard results. | U |
| | CO4: Demonstrate how to interpolate using a suitable interpolation formula. | U |
| **NLT1C - Basic Tamil I** | CO1: தமிழ் எழுத்துக்களின் வகைகளை எழுதவும் படிக்கவும் அறிந்து கொள்வர். | U |
| | CO2: சொற்களின் வகைகளை அறிந்து கொள்வர். | U |
| | CO3: வாக்கிய அமைப்பு முறை மற்றும் பிழையின்றி எழுதத் தெரிந்து கொள்வர். | U |
| | CO4: தமிழ் எண்கள், உறவுப் பெயர்கள், வாழ் இடங்கள் மற்றும் பொருள்கள் பற்றித் தெரிந்து கொள்வர். | U |
| | CO5: தமிழகத்தின் இயற்கை, விழாக்கள் மற்றும் உணவு முறைகளை அறிந்து கொள்வர். | U |
| **TLT1C - Advanced Tamil I** | CO1: இக்கால இலக்கியங்கள் உணர்த்தும் கருத்துகள், துய்க்கும் முறைகளை அறிந்து கொள்வர். | U |
| | CO2: இக்கால இலக்கிய வகைகள் மற்றும் வரலாற்றை தெரிந்து கொள்வர். | U |
| | CO3: மொழியைத் திறம்படப் பயன்படுத்தும் ஆற்றலைப் பெறுவர். | U |
| **CC5AC - Non Major Elective I - Health Care Management** | CO1:Awareness to overcome health problems. | U |
| | CO2:Explain the importance of self health care management. | U |
| | CO3:Explain the significance of family and communal health | U |
| | CO4:Explain the techniques of disaster management. | U |

| Course Code & Course Name | Course Outcomes<br>At the end of this course the students will be able to | Cognitive Level |
|---|---|---|
| **PZ1SA - Professional English for Physical Sciences** | CO1: Demonstrate their listening skill. | U |
| | CO2: Illustrate the use of language skills for speaking with confidence in an intelligible and acceptablemanner. | U |
| | CO3: Illustrate their reading skill while reading independently unfamiliar texts with comprehension. | U |
| | CO4: Illustrate their writing skill while writing simple sentences without committing error of spelling or grammar. | U |
| **I Year - II Semester** | | |
| **LA12A - Tamil II** | CO1: சங்க இலக்கியம், அற இலக்கியங்களின் அமைப்பு மற்றும் இலக்கிய வரலாற்றையும் தெரிந்து கொள்வர். | U |
| | CO2: சங்க இலக்கியம், அற இலக்கியங்களின் சிறப்பியல்புகள், உணர்த்தும் விழுமியங்களை அறிந்து கொள்வர். | U |
| | CO3: மொழியைத் திறம்படப் பயன்படுத்தும் ஆற்றலைப் பெறுவர். | U |
| **CLE2G - HINDI II** | CO1: Understand and explain the one act plays and make students get a good opportunity to get acquainted with the situation of the society which helps in making the girl students self-reliant. | U |
| | CO2: Summarize the author's experience in the story. | U |
| | CO3: Infer the phrase and translate the passages. | U |
| **CLG2G - SANSKRIT II** | CO1: Explain the merits of Gadya kavyas in Sanskrit literature. | U |
| | CO2: Explain Sanskrit grammar-Lakaras and Shabdas. | R |
| | CO3: Summarize the moral derived from the stories. | U |
| **CLK2T - FRENCH II** | CO1: Explain the different parts of speech. | U |
| | CO2: Recall the short texts. | R |
| | CO3: Outline the culture and tradition. | U |
| **LZ12A - Communicative English II** | CO1: Demonstrate the learnt LSRW skills to communicate their ideas. | U |
| | CO2: Find the correct vocabulary to use in the given context. | R |
| | CO3: Demonstrate the right usage of grammar. | U |
| **SM22A - Trigonometry** | CO1: Acquire knowlege about the expansions of Trigonometric Functions, Hyperbolic Functions and sum of Trigonometric Series. | U |
| | CO2:Illustrate how to expand powers and multiple angles of trigonometric functions. | U |
| | CO3:Relate circular and hyperbolic functions. | U |
| | CO4:Find the logarithm of a complex number. | R |
| | CO5:Show how to obtain the sums of finite and infinite trigonometrical series. | R |

| Course Code & Course Name | Course Outcomes<br>At the end of this course the students will be able to | Cognitive Level |
|---|---|---|
| **SM22B - Integral Calculus and Vector Analysis** | CO1: Acquire Knowledge about Integration and its eometrical applications, double, triple integrals and improper integrals,Vector differentiation and Vector integration. | U |
| | CO2:Recall integration by parts and bernoulli's formula to derive the reduction formulae for different kinds of functions | R |
| | CO3:Illustrate problems in double and triple integral. | U |
| | CO4:Relate the properties of beta and gamma functions. | U |
| | CO5:Define gradient, curl, solenoidal and irrotational vectors. | R |
| | CO6:Illustrate problems in line, surface and volume integrals. | U |
| **SM3AF - Calculus of Finite Differences and Numerical Analysis-II** | CO1: Acquire knowledge about Numerical techniques used as powerful tools in scientific computing. | U |
| | CO2: Acquire knowledge about numerical integration, numerical differentiation and difference equation. | U |
| | CO3:Explain the methods of solving higher order linear homogeneous and non-homogeneous difference equations. | U |
| | CO4:Illustrate the methods of finding numerical solution of ordinary differential equations of first order. | U |
| **NLT2D- Basic Tamil II** | CO1: நீதி இலக்கியங்கள் உணர்த்தும் அறங்களை அறிந்து கொள்வர். | U |
| | CO2: நீதி கதைகள் உணர்த்தும் அறங்களைத் தெரிந்து கொள்வர். | U |
| | CO3: தமிழ் இலக்கியம், தமிழக வரலாறு மற்றும் அலுவலகப் பெயர்கள் பற்றித் தெரிந்து கொள்வர். | U |
| | CO4: பழமொழிகள் உணர்த்தும் விழுமியங்களை அறிந்து கொள்வர். | U |
| **TLT2D - Advanced Tamil II** | CO1: கட்டுரைகளின் வழி சமுதாயச் சூழல்களை, மாறுபாடுகளை அறிந்து கொள்வர். | U |
| | CO2: சங்க இலக்கியங்கள், பக்தி, காப்பிய இலக்கியங்கள் உணர்த்தும் விழுமியங்களை அறிந்து கொள்வர். | U |
| | CO3: சங்க இலக்கியம், பக்தி, காப்பிய இலக்கியம், கட்டுரை இலக்கிய வரலாறுகளைத் தெரிந்து கொள்வர். | U |
| | CO4: மொழியைத் திறம்படப் பயன்படுத்தும் ஆற்றலைப் பெறுவர். | U |
| **PZ1SC - Professional English for Physical Sciences** | CO1: Illustrate interview skills with boldness and confidence. | U |
| | CO2: Show adaptability in the workplace context, having become efficient listeners and readers. | U |
| | CO3: Demonstrate their skills to apply to the Research & Development organisations/sections in companies and offices with winning proposals. | U |

| Course Code & Course Name | Course Outcomes<br>At the end of this course the students will be able to | Cognitive Level |
|---|---|---|
| **II Year - III Semester** | | |
| **LA13A - Tamil III** | CO1: பக்தி இலக்கியம் (சைவம், வைணவம், சித்தர், கிறித்தவம், இஸ்லாம்), சிற்றிலக்கியங்களின் பின்னணி, இலக்கிய வரலாற்றைத் தெரிந்து கொள்வர். | U |
| | CO2: பக்தி இலக்கியம் (சைவம், வைணவம், சித்தர், கிறித்தவம், இஸ்லாம்), சிற்றிலக்கியங்களின் பொருண்மைகள், விழுமியங்கள், சிறப்பியல்புகளை அறிந்து கொள்வர். | U |
| | CO3: மொழியைத் திறம்படப் பயன்படுத்தும் முறைகளைக் கற்றுக் கொள்வர். | U |
| **CLE3H - Hindi III** | CO1: Explain the moral of the poetry in tamil and contrast with the hindi literature | U |
| | CO2: Outline the experiences of the poets and their societies. | U |
| | CO3: Explain the thought, ideology, expressional and artistic skills of writers. | U |
| **CLG3H - Sanskrit III** | CO1: Summarize the origin, development and characteristics of dramas in Sanskrit literature. | U |
| | CO2: Explain the lang lakaras of selected roots. | U |
| | CO3: Explain the text of Madhyamavyayoga of Bhasa and its merits. | U |
| **CLK3V - French III** | CO1: Outline the overview of the short literary texts | U |
| | CO2: Explain the literary text . | U |
| | CO3: Make use of the rules of grammar in the texts | P |
| **LZ13B - Language through Literature I** | CO1: Extend their vocabulary and use them appropriately to communicate in contexts | U |
| | CO2: Infer the commonly occurring errors to avoid committing them in language use | U |
| | CO3: Rephrase words and sentences by changing their forms and use them appropriately | U |
| | CO4: Demonstrate improvement in their pronunciation | U |
| | CO5: Demonstrate different kinds of writing – essays, emails, blogs, letters etc. - prepare resumes to face interviews | U |
| | CO6: Extend short stories into plays, skit and role plays by making a dramatic script of the scenes. | U |
| | CO7: Show their ability to develop a webpage for themselves and others | U |
| | CO8: Explain their awareness of contemporary issues and themes that are socially relevant by reading texts of different literary genres | U |
| **SM23A - Analytical Geometry** | CO1: Analyze characteristics and properties of two and three dimensional geometric shapes and to develop mathematical arguments about geometric relationships and its applications in real world. | U |
| | CO2: Define the basic concepts of two and three dimensional geometry. | R |
| | CO3: Illustrate the various methods of finding equations of pole,polar,straight line,Plane and Sphere. | U |

| Course Code & Course Name | Course Outcomes<br>At the end of this course the students will be able to | Cognitive Level |
|---|---|---|
| **SM23B - Differential Equations** | CO1:Acquire knowledge about the methods of solving Ordinary and Partial Differential Equations and introduce Differential Equation as a powerful tool in solving problems in Science. | U |
| | CO2 :Illustrate various methods of solving ordinary and partial differential equations. | U |
| | CO3: Explain the method of forming partial differential equations. | U |
| **SM3AC - Mathematical Statistics I** | CO1:Acquire knowledge on Probability laws and Bayes theorem, Measure of location,Dispersion, Correlation and Regression, Discrete and Continuous Probability Distributions. | U |
| | CO2:Explain the basic laws and theorems on Probability. | U |
| | CO3 : Recall the concept of Random variables and its characteristics. | R |
| | CO4 : Explain the concept of characteristics function and related theorems. | U |
| | CO5 : Relate variables by finding the coefficient of correlation and regression. | U |
| | CO6 : Illustrate the various characteristics of discrete and continuous probability distribution. | U |
| **TSSEB - Essentials of Language and Communication Skills** | CO1: Interpret the process and concepts pertaining to listening, speaking and reading. | U |
| | CO2: Demonstrate their writing skills to fulfill the requirements for employment. | U |
| | CO3: Demonstrate their ability to use Business correspondences and its types. | U |
| **II Year - IV Semester** | | |
| **LA14A - Tamil IV** | CO1: காப்பியம், சிற்றிலக்கியம், இசுலாமியம் மற்றும் கிறித்துவ இலக்கியங்களின் அமைப்பு, இலக்கிய வரலாறுகளைத் தெரிந்து கொள்வர். | U |
| | CO2: காப்பியம், சிற்றிலக்கியம் ஆகியவற்றின் செல்நெறிகளை அறிந்து கொள்வர். | U |
| | CO3: படைப்பாற்றலை வளர்த்துக் கொள்வர். கலைச்சொல்லாக்கம் செய்யக் கற்றுக் கொள்வர். | U |
| **CLE4J - Hindi IV** | CO1: Summarize the poetic skills of poets and their poems. | U |
| | CO2: Explain the modern hindi literature and its current advances. | U |
| | CO3: Outline the human, social, ethical and literary values | U |
| **CLG4J - Sanskrit IV** | CO1: Explain the greatness of the two main epics and devotional lyrics in literature. | U |
| | CO2: Translate of passages from Ramayana, Mahabharata and Didactic works. | U |
| | CO3: Explain the figures of speech in literature and to identify such usages. | U |

| Course Code & Course Name | Course Outcomes<br>At the end of this course the students will be able to | Cognitive Level |
|---|---|---|
| **CLK4W - French IV** | CO1: Outline the overview of the short literary texts | U |
| | CO2: Explain the literary text . | U |
| | CO3: Make use of the rules of grammar in the texts | P |
| **LZ14B - Language through Literature II** | CO1: Show the ability to gather ideas and information to collaborate and write with clarity and ease. | U |
| | CO2: Demonstrate different kinds of writing. | U |
| | CO3: Show the ability to construct itineraries, checklists and write about social events, festivals, sports, nature and environment. | U |
| | CO4: Infer details from various information to write opinions, reviews and appraisals. | U |
| | CO5: Demonstrate basic skills of translation. | U |
| | CO6: Show understanding of topics/characters/ideas by writing an acrostic poem. | U |
| | CO7: Explain the unity and diversity in Indian cultures. | U |
| | CO8: Outline stories based on text and picture-based hints. | U |
| | CO9: Rephrase and extend the plot of a story. | U |
| | CO10: Illustrate their sensibility to the social and economic divisions that prevail and its consequences. | U |
| | CO11: Demonstrate their skills of creativity and critical thinking that will help them form opinions, make decisions and seek solutions. | U |
| **SM24A - Transform Techniques** | CO1:Acquire knowledge about Laplace Transforms and its inverse in solving ordinary differential equations with constant coefficients simultaneous ordinary differential equations. | U |
| | CO2: Aquire knowledge to solve Problems in Fourier series and fourier transform. | U |
| | CO3:Explain the basic concepts in transform techniques. | U |
| **SM24B - Statics** | CO1: Acquire knowledge about particles or body in rest under the given forces and forces, equilibrium of a particle and centre of mass of various bodies. | U |
| | CO2:Classify the forces and to resolve them into two components | U |
| | CO3: Illustrate how to find the centre of mass. | U |
| | CO4: Find the tension in hanging strings. | R |

| Course Code & Course Name | Course Outcomes<br>At the end of this course the students will be able to | Cognitive Level |
|---|---|---|
| **SM3AG - Mathematical Statistics II** | CO1: Acquire knowledge to provide the foundation of statistical analysis used in varied applications,Of Sampling methods, Tests of significance and testing of hypothesis | U |
| | CO2: Explain the basic characteristics of sampling theory and sampling distribution. | U |
| | CO3: Explain the basic concept of estimation and different kinds of estimators. | U |
| | CO4: Demonstrate the method of hypothesis testing to draw statistical inferences. | U |
| | CO5: Illustrate the difference among means using the method of ANOVA. | U |
| | CO6: Explain the method of constructing the confidence interval for population means. | U |
| **SM3A1- Mathematical Statistics Practicals** | CO1: Acquire knowledge on Probability laws and Bayes theorem, Measure of location,Dispersion, Correlation and Regression, Discrete and Continuous Probability Distributions. | U |
| | CO2: Acquire knowledge to provide the foundation of statistical analysis used in varied applications,Of Sampling methods, Tests of significance and testing of hypothesis. | U |
| **TSSE1 -Computing Skills** | CO1:Understand the fundamentals of operating systems and networking. | U |
| | CO2: Understand the basic features in MS word, MS Excel and MS power point. | U |
| **ENV4B - Environmental Studies** | CO1: Explain the concepts of ecosystem and biodiversity. | U |
| | CO2: Explain the environmental problems, policies and practices. | U |
| **III Year - V Semester** | | |
| **SM25A-Algebraic Structures I** | CO: Acquire knowledge about the concepts of Sets, Groups and Rings. | U |
| | CO2: Illustrate the various properties and theorems related to groups and subgroups. | U |
| | CO3:Explain the Cayley's theorem and permutation groups. | U |
| | CO4: Summarize the lemmas and theorems in rings. | U |
| | CO5: Extend the concepts of rings to Euclidean ring. | U |
| **SM25B-Real Analysis I** | CO1: Acquire knowledge to apply mathematical concepts and principles to perform numerical and symbolic computations, understand and perform simple proofs in real analysis and to know abstract ideas and rigorious methods in mathematical analysis can be applied. | U |
| | CO2: Define the fundamental concepts in real analysis. | R |
| | CO3: Explain the properties of Convergent and divergent sequences and series. | U |
| | CO4: Illustrate the concepts in limits and metric spaces. | U |

| Course Code & Course Name | Course Outcomes<br>At the end of this course the students will be able to | Cognitive Level |
|---|---|---|
| **SM25C-Dynamics** | CO1: Acquire knowledge of the motion of bodies under the influences of forces. | U |
| | CO2: Acquire knowledge of Rectilinear motion of Projectiles ,Impact and Moment of Inertia of Particles. | U |
| | CO3: Define fundamental concepts in dynamics. | R |
| **SM25D-Discrete Mathematics** | CO1: Apply tools and ideas in Mathematics for solvingApplied Problems and To Evaluate Boolean functions and to express a logic sentence in terms of Predicates, quantifiers, and logical connectives. | U |
| | CO2: Explain the basic properties of sets,Mathematical induction and representation of positive integers. | U |
| | CO3: Demonstrate how boolean algebra is used in circuits and Logical gates. | U |
| | CO4:Illustrate how to solve complex counting problems using the tools recurrence relations and generating functions. | U |
| | CO5 :Demonstrate how to verify the logical validity of the arguments using proportional and predicate logic. | U |
| **SM45A- Programming in C(Theory)/SM451- C Practicals** | CO1: Acquire knowledge about the basic concepts and structure of 'C' program. | U |
| | CO2: Write simple programs with Mathematical Applications. | P |
| **VAE5Q-Value Education** | CO1: Understand the basic concept of values in life. | U |
| | CO2: Acquire the values oriented to education in life. | U |
| **III Year - VI Semester** | | |
| **SM26A- Algebraic Structures 2** | CO1: Acquire knowledge about the Vector space, Dual spaces and inner product spaces and linear transformation. | U |
| | CO2:Define all the basic concepts that are used in Vector space, Dual spaces and inner product spaces. | R |
| | CO3: Summarize the lemmas,theorems and properties of Vector, dual and inner product spaces. | U |
| | CO4: Explain the linear transformation and its applications. | U |
| | CO5: Extend the concepts of linear transformation to matrices and its cannonical and triangular forms. | U |
| **SM26B-Real Analysis II** | CO1: Acquire knowledge about real numbers,analytic properties of real valued functions. | U |
| | CO2: Acquire knowledge about the analytic concepts of connectedness, compactness, completeness and calculus. | U |
| | CO3:Demonstrate how to solve problems related to the theorems learnt. | U |

| Course Code & Course Name | Course Outcomes<br>At the end of this course the students will be able to | Cognitive Level |
|---|---|---|
| **SM26C-Complex Analysis** | CO1: Acquire the knowledge about the basic ideas of analysis of complex functions in solving complex variables. | U |
| | CO2: Explain the transformations of different kinds of complex valued functions. | U |
| | CO3: Summarise the Cauchy's fundamental theorem and Cauchy's residue theorem to evaluate integral of a function. | U |
| | CO4: Classify the singular points and represent a given function as a taylor series or Laurent series. | U |
| **SM4AG - Graph Theory** | CO1: Acquire knowledge to describe and apply some basic algorithm of graphs and to model real world problems using graph theory. | U |
| | CO2:Define the basic terminologies and concepts related to graphs, subgraphs and its properties. | R |
| | CO3: Demonstrate how to solve problems related to the concepts learnt in graph theory. | U |
| | CO4: Summarize the theorems in graphs. | U |
| | CO5: illustrate certain properties of graphs. | U |
| **SM4AH - Operations Research** | CO1: Acquire knowledge in solving LPP. | U |
| | CO2: Acquire knowledge in sequencing the jobs to be carried out based on cost optimization. | U |
| | CO3: Acquire knowledge in solving assignment and transportation problem and queuing theory models. | U |
| | CO4:Illustrate the method of solving Two person Zero-sum game,dominance method. | U |
| | CO5:Explain how to find the critical path and the estimated completion time for a given project using CPM and PERT. | U |