



**THIRUVALLUVAR UNIVERSITY
SERKKADU, VELLORE-632115**

**B.SC.,
MATHEMATICS WITH
COMPUTER APPLICATION
SYLLABUS**

**FROM THE ACADEMIC YEAR
2023 – 2024**

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1. Introduction

B.Sc. Mathematics with Computer Applications: Programme Outcome, Programme Specific Outcome and Course Outcome

Mathematics is the study of quantity, structure, space and change, focusing on problem solving, with wider scope of application in science, engineering, technology, social sciences etc. The key core areas of study in Mathematics include Algebra, Analysis (Real & Complex), Differential Equations, Geometry, and Mechanics. The Bachelor's Degree B.Sc. Mathematics with Computer Applications is awarded to the students on the basis of knowledge, understanding, skills, attitudes, values and academic achievements expected to be acquired by learners at the end of the Programme. Learning outcomes are aimed at facilitating the learners to acquire these attributes, keeping in view of their preferences and aspirations for gaining knowledge of Mathematics and Computer Science.

As per the guidelines given by the University Grants Commission and the Tamil Nadu State Council for Higher Education, the B.Sc. degree programme is designed in such a way to have a foundation in Mathematics and Computer Applications, a Mathematical attitude towards problem formulation and solving analytical skills and desire for correctness, and appreciation of the approaching of mathematical techniques, the programming skills at higher level Computer Language and research aptitude in both Mathematics and Computer Applications.

Students completing this programme will be able to present Mathematics clearly and precisely, make abstract ideas precise by formulating them in the language of Mathematics, describe Mathematical ideas from multiple perspectives and explain fundamental concepts of Mathematics to non-Mathematicians.

Completion of this programme will also enable the learners to join teaching profession, enhance their employability for government jobs, jobs in banking, insurance and investment sectors, data analyst jobs and jobs in various other public and private enterprises and IT Sectors. .

LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK GUIDELINES BASED REGULATIONS FOR UNDER GRADUATE PROGRAMME	
Programme:	B.Sc., MATHEMATICS WITH COMPUTER APPLICATIONS
Programme Code:	
Duration:	3 years [UG]
Programme Outcomes:	<p>PO1: Disciplinary knowledge: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate Programme of study</p> <p>PO2: Communication Skills: Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.</p> <p>PO3: Critical thinking: Capability to apply analytic thought to a body of knowledge; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.</p> <p>PO4: Problem solving: Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations.</p> <p>PO5: Analytical reasoning: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples, and addressing opposing viewpoints.</p> <p>PO6: Research-related skills: A sense of inquiry and capability for asking relevant/appropriate questions, problem arising, synthesising and articulating; Ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation</p> <p>PO7: Cooperation/Team work: Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team</p> <p>PO8: Scientific reasoning: Ability to analyse, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.</p> <p>PO9: Reflective thinking: Critical sensibility to lived experiences, with self awareness and reflexivity of both self and society.</p> <p>PO10 Information/digital literacy: Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of</p>

	<p>data.</p> <p>PO 11 Self-directed learning: Ability to work independently, identify appropriate resources required for a project, and manage a project through to completion.</p> <p>PO 12 Multicultural competence: Possess knowledge of the values and beliefs of multiple cultures and a global perspective; and capability to effectively engage in a multicultural society and interact respectfully with diverse groups.</p> <p>PO 13: Moral and ethical awareness/reasoning: Ability to embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. Capable of demonstrating the ability to identify ethical issues related to one's work, avoid unethical behaviour such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights; appreciating environmental and sustainability issues; and adopting objective, unbiased and truthful actions in all aspects of work.</p> <p>PO 14: Leadership readiness/qualities: Capability for mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision, building a team who can help achieve the vision, motivating and inspiring team members to engage with that vision, and using management skills to guide people to the right destination, in a smooth and efficient way.</p> <p>PO 15: Lifelong learning: Ability to acquire knowledge and skills, including „learning how to learn“, that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives, and adapting to changing trades and demands of work place through knowledge/skill development/reskilling.</p>
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Under Graduate Programme

Programme Outcomes:

PO1: Disciplinary Knowledge: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study.

PO2: Critical Thinking: Capability to apply analytic thought to a body of knowledge; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.

PO3: Problem Solving: Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations.

PO4: Analytical Reasoning: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples and addressing opposing viewpoints.

PO5: Information/digital literacy: Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data.

PO6: Self-directed & Lifelong Learning: Ability to work independently, identify and manage a project. Ability to acquire knowledge and skills, including "learning how to learn", through self-placed and self-directed learning aimed at personal development, meeting economic, social and cultural objectives.

B.Sc Mathematics with Computer Applications

Programme Specific Outcomes:

PSO1: Acquire good knowledge and understanding, to solve specific theoretical & applied problems in different area of Mathematics.

PSO2: Identify the application of Mathematics in other discipline and society to solve real life problems.

PSO3: Explore and apply technical knowledge in diverse areas of Computer Applications and Mathematics is conducive in cultivating skills for successful career, entrepreneurship.

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) can be carried out accordingly, assigning the appropriate level in the grids:

	POs							PSOs		
	1	2	3	4	5	6	...	1	2	...
CLO1										
CLO2										
CLO3										
CLO4										
CLO5										

3. Strong Correlation 2. Medium Correlation 1. Low Correlation

Highlights of the Revamped Curriculum:

- Student-centric, meeting the demands of industry & society, incorporating industrial components, hands-on training, skill enhancement modules, industrial project, project with viva-voce, exposure to entrepreneurial skills, training for competitive examinations, sustaining the quality of the core components and incorporating application-oriented content wherever required.
- The Core subjects include latest developments in the education and scientific front, advanced programming packages allied with the discipline topics, practical training, devising mathematical models and algorithms for providing solutions to industry / real life situations. The curriculum also facilitates peer learning with advanced mathematical topics in the final semester, catering to the needs of stakeholders with research aptitude.
- The General Studies and Mathematics based problem solving skills are included as mandatory components in the ‘Training for Competitive Examinations’ course at the final semester, a first of its kind.
- The curriculum is designed so as to strengthen the Industry-Academia interface and provide more job opportunities for the students.
- The Industrial Statistics course is newly introduced in the fourth semester, to expose the students to real life problems and train the students on designing a mathematical model to provide solutions to the industrial problems.
- The Internship during the second year vacation will help the students gain valuable work experience, that connects classroom knowledge to real world experience and to narrow down and focus on the career path.
- Project with viva-voce component in the fifth semester enables the student, application of conceptual knowledge to practical situations. The state of art technologies in conducting a Explain in a scientific and systematic way and arriving at a precise solution is ensured. Such innovative provisions of the industrial training, project and internships will give students an edge over the counterparts in the job market.
- State-of Art techniques from the streams of multi-disciplinary, cross disciplinary and inter disciplinary nature are incorporated as Elective courses, covering conventional topics to the latest - Artificial Intelligence.

Value additions in the Revamped Curriculum:

Semester	Newly introduced Components	Outcome / Benefits
I	Foundation Course To ease the transition of learning from higher secondary to higher education, providing an overview of the pedagogy of learning abstract Mathematics and simulating mathematical concepts to real world.	<ul style="list-style-type: none"> • Instil confidence among students • Create interest for the subject
I, II, III, IV	Skill Enhancement papers (Discipline centric / Generic / Entrepreneurial)	<ul style="list-style-type: none"> • Industry ready graduates • Skilled human resource • Students are equipped with essential skills to make them employable
		<ul style="list-style-type: none"> • Training on Computing / Computational skills enable the students gain knowledge and exposure on latest computational aspects
		<ul style="list-style-type: none"> • Data analytical skills will enable students gain internships, apprenticeships, field work involving data collection, compilation, analysis etc.
		<ul style="list-style-type: none"> • Entrepreneurial skill training will provide an opportunity for independent livelihood • Generates self – employment • Create small scale entrepreneurs • Training to girls leads to women empowerment
		<ul style="list-style-type: none"> • Discipline centric skill will improve the Technical knowhow of solving real life problems using ICT tools
III, IV, V & VI	Elective papers- An open choice of topics categorized under Generic and Discipline Centric	<ul style="list-style-type: none"> • Strengthening the domain knowledge • Introducing the stakeholders to the State-of Art techniques from the streams of multi-disciplinary, cross disciplinary and inter disciplinary nature • Students are exposed to Latest topics on Computer Science / IT, that require strong mathematical background • Emerging topics in higher education / industry / communication network / health sector etc. are introduced with hands-on-training, facilitates

		designing of mathematical models in the respective sectors
IV	Industrial Statistics	<ul style="list-style-type: none"> • Exposure to industry moulds students into solution providers • Generates Industry ready graduates • Employment opportunities enhanced
II year Vacation activity	Internship / Industrial Training	<ul style="list-style-type: none"> • Practical training at the Industry/ Banking Sector / Private/ Public sector organizations / Educational institutions, enable the students gain professional experience and also become responsible citizens.
V Semester	Project with Viva – voce	<ul style="list-style-type: none"> • Self-learning is enhanced • Application of the concept to real situation is conceived resulting in tangible outcome
VI Semester	Introduction of Professional Competency component	<ul style="list-style-type: none"> • Curriculum design accommodates all category of learners; ‘Mathematics for Advanced Explain’ component will comprise of advanced topics in Mathematics and allied fields, for those in the peer group / aspiring researchers; • ‘Training for Competitive Examinations’ –caters to the needs of the aspirants towards most sought - after services of the nation viz, UPSC, CDS, NDA, Banking Services, CAT, TNPSC group services, etc.
Extra Credits: For Advanced Learners / Honours degree		<ul style="list-style-type: none"> • To cater to the needs of peer learners / research aspirants

Skills acquired from the Courses	Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill
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Credit and Hours Distribution System for all UG courses including Lab Hours

First Year – Semester-I

Part	List of Courses	Credit	No. of Hours
Part-1	Tamil or other Languages	3	6
Part-2	English	3	6
Part-3	Core Courses & Elective Courses [in Total]	13	14
Part-4	Skill Enhancement Course COURSE-1	2	2
	Foundation Course	2	2
		23	30

Semester-II

Part	List of Courses	Credit	No. of Hours
Part-1	Tamil or other Languages	3	6
Part-2	English	3	6
Part-3	Core Courses & Elective Courses including laboratory [in Total]	13	14
Part-4	Skill Enhancement Course -COURSE-2	2	2
	Skill Enhancement Course -COURSE-3 (Discipline / Subject Specific)	2	2
		23	30

Second Year – Semester-III

Part	List of Courses	Credit	No. of Hours
Part-1	Tamil or other Languages	3	6
Part-2	English	3	6
Part-3	Core Courses & Elective Courses including laboratory [in Total]	13	14
Part-4	Skill Enhancement Course -COURSE-4 (Entrepreneurial Based)	1	1
	Skill Enhancement Course -COURSE-5 (Discipline / Subject Specific)	2	2
	Environmental Studies	-	1
		22	30

Semester-IV

Part	List of Courses	Credit	No. of Hours
Part-1	Tamil or other Languages	3	6

Part-2	English	3	6
Part-3	Core Courses & Elective Courses including laboratory [in Total]	13	13
Part-4	Skill Enhancement Course -COURSE-6 (Discipline / Subject Specific)	2	2
	Skill Enhancement Course -COURSE-7 (Discipline / Subject Specific)	2	2
	Environmental Studies	2	1
		25	30

**Third Year
Semester-V**

Part	List of Courses	Credit	No. of Hours
Part-3	Core Courses including Project / Elective Based	22	28
Part-4	Value Education	2	2
	Internship / Industrial Visit / Field Visit	2	
		26	30

Semester-VI

Part	List of Courses	Credit	No. of Hours
Part-3	Core Courses including Project / Elective Based & LAB	18	28
Part-4	Extension Activity	1	-
	Professional Competency Skill	2	2
		21	30

Credit Distribution for UG Programmes

Sem I	Credit	H	Sem II	Credit	H	Sem III	Credit	H	Sem IV	Credit	H	Sem V	Credit	H	Sem VI	Credit	H
1.1 Part-1 Tamil or other Languages	3	6	2.1 Part-1 Tamil or other Languages	3	6	3.1 Part-1 Tamil or other Languages	3	6	4.1 Part-1 Tamil or other Languages	3	6	5.1 Core Course IX	4	5	6.1 Core Course – XIII	4	6
1.2 Part-2 English	3	6	2.2 Part-2 English	3	6	3.2 Part-2 English	3	6	4.2 Part-2 English	3	6	5.2 Core Course X	4	5	6.2 Core Course XIV	4	6
1.3 Core Course I	5	5	2.3 Core Course III	5	5	3.3 Core Course V	5	5	4.3 Core Course VII Core Industry Module	5	5	5.3 Core Course XI	4	5	6.3 Core Course XV	4	6
1.4 Core Course II	5	5	2.4 Core Course IV	5	5	3.4 Core Course VI	5	5	4.4 Core Course VIII	5	5	5.4 Core Course – / Project with viva- voce XII	4	5	6.4 Elective VII Generic/ Discipline Specific	3	5
1.5 Elective I Generic/ Discipline Specific	3	4	2.5 Elective II Generic/ Discipline Specific	3	4	3.5 Elective III Generic/ Discipline Specific	3	4	4.5 Elective IV Generic/ Discipline Specific	3	3	5.5 Elective V Generic/ Discipline Specific	3	4	6.5 Elective VIII Generic/ Discipline Specific	3	5
1.6 Skill Enhancement Course-1	2	2	2.6 Skill Enhancement Course-2	2	2	3.6 Skill Enhancement Course 4, (Entrepreneurial Skill)	1	1	4.6 Skill Enhancement Course 6	2	2	5.6 Elective VI Generic/ Discipline Specific	3	4	6.6 Extension Activity	1	-
1.7 Skill Enhancement - (Foundation Course)	2	2	2.7 Skill Enhancement Course 3	2	2	3.7 Skill Enhancement Course 5	2	2	4.7 Skill Enhancement Course 7	2	2	5.7 Value Education	2	2	6.7 Professional Competency Skill	2	2
						3.8 Environmental Studies	-	1	4.8 Environmental Studies	2	1	5.8 Summer Internship /Industrial Training	2				
	23	30		23	30		22	30		25	30		26	30		21	30
Total – 140 Credits																	

METHODS OF EVALUATION		
Internal Evaluation	Continuous Internal Assessment Test	25 Marks
	Assignments / Snap Test / Quiz	
	Seminars	
	Attendance and Class Participation	
External Evaluation	End Semester Examination	75 Marks
Total		100 Marks
METHODS OF ASSESSMENT		
Remembering (K1)	<ul style="list-style-type: none"> • The lowest level of questions require students to recall information from the course content • Knowledge questions usually require students to identify information in the textbook. 	
Understanding (K2)	<ul style="list-style-type: none"> • Understanding of facts and ideas by comprehending organizing, comparing, translating, interpolating and interpreting in their own words. • The questions go beyond simple recall and require students to combine data together 	
Application (K3)	<ul style="list-style-type: none"> • Students have to solve problems by using / applying a concept learned in the classroom. • Students must use their knowledge to determine a exact response. 	
Analyze (K4)	<ul style="list-style-type: none"> • Analyzing the question is one that asks the students to break down something into its component parts. • Analyzing requires students to identify reasons causes or motives and reach conclusions or generalizations. 	
Evaluate (K5)	<ul style="list-style-type: none"> • Evaluation requires an individual to make judgment on something. • Questions to be asked to judge the value of an idea, a character, a work of art, or a solution to a problem. • Students are engaged in decision-making and problem – solving. • Evaluation questions do not have single right answers. 	
Create (K6)	<ul style="list-style-type: none"> • The questions of this category challenge students to get engaged in creative and original thinking. 	

	<ul style="list-style-type: none">• Developing original ideas and problem solving skills
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B.Sc., Mathematics with Computer Applications including Lab Hours

First Year – Semester-I

Part	List of Courses	Credit	No. of Hours
Part 1.1	Tamil or other Languages	3	6
Part.2 English	English	3	6
1.3 Core Course-I	Algebra & Trigonometry	5	5
1.4 Core Course II	Calculus	5	5
1.5 Elective I Generic/ Discipline Specific	Elective I – Web Designing with HTML(With Lab)	3	4
1.6 Skill Enhancement Course	Skill Enhancement Course SEC-1 Choose any one from the list given below	2	2
1.7 Skill Enhancement - (Foundation Course)	Foundation Course	2	2
	Total -	23	30

Title of the Course		ALGEBRA & TRIGONOMETRY					
Paper Number		CORE PAPER I					
Category	Core	Year	I	Credits	5	Course Code	
		Semester	I				
Instructional Hours per week		Lecture	Tutorial	Lab Practice	Total		
		4	1	--	5		
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		<ul style="list-style-type: none"> • Basic ideas on the Theory of Equations, Matrices and Number Theory. • Knowledge to find expansions of trigonometry functions, solve theoretical and applied problems. 					
Course Outline		Unit I: Reciprocal Equations-Standard form-Increasing or decreasing the roots of a given equation- Removal of terms, Approximate solutions of roots of polynomials by Horner's method – Simple problems.					
		Unit II: Summation of Series: Binomial– Exponential –Logarithmic series (Theorems without proof) – Approximations - Simple problems.					
		Unit III: Characteristic equation –Eigen values and Eigen Vectors-Similar matrices - Cayley –Hamilton Theorem (Statement only) - Finding powers of square matrix-Inverse of a square matrix up to order 3, Diagonalization of square matrices - Simple problems.					
		Unit IV: Expansions of $\sin n\theta$, $\cos n\theta$ in powers of $\sin\theta$, $\cos\theta$ - Expansion of $\tan n\theta$ in terms of $\tan \theta$, Expansions of $\cos^n\theta$, $\sin^n\theta$, $\cos^m\theta\sin^n\theta$ –Expansions of $\tan(\theta_1+\theta_2+\dots+\theta_n)$ -Expansions of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in terms of θ - Simple problems.					
		Unit V: Hyperbolic functions – Relation between circular and hyperbolic functions Inverse hyperbolic functions, Logarithm of complex quantities, Summation of trigonometric series – Simple problems.					
Skills acquired from this course		Knowledge, problem solving, analytical ability, professional competency, professional communication and transferable skill.					

Recommended Text	1. W.S. Burnstine and A.W. Panton, Theory of equations 2. David C. Lay, Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007 3. G.B. Thomas and R.L. Finney, Calculus, 9th Ed., Pearson Education, Delhi, 2005 4. C.V. Durell and A. Robson, Advanced Trigonometry, Courier Corporation, 2003 5. J. Stewart, L. Redlin, and S. Watson, Algebra and Trigonometry, Cengage Learning, 2012. 6. Calculus and Analytical Geometry, G.B. Thomas and R. L. Finny, Pearson Publication, 9 th Edition, 2010.
Website and e-Learning Source	https://nptel.ac.in

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total
25	75	100

Course Learning Outcome (for Mapping with POs and PSOs)

Students will be able to

CLO 1: Classify and Solve reciprocal equations.

CLO 2: Calculate the sum of binomial, exponential and logarithmic series.

CLO 3: Estimate Eigen values, Eigen vectors, verify Cayley – Hamilton theorem and Diagonalize the given matrix.

CLO 4: Expand the powers and multiples of trigonometric functions in terms of sine and cosine.

CLO 5: Determine relationship between circular and hyperbolic functions and the summation of trigonometric series.

	POs						PSOs		
	1	2	3	4	5	6	1	2	3
CLO1	3	2	3	1	-	1	3	2	1
CLO2	2	2	3	2	-	-	3	2	1
CLO3	3	2	3	1	-	1	3	2	1
CLO4	3	2	3	1	1	-	3	2	1
CLO5	3	2	3	2	1	1	3	2	1

3 - Strong Correlation 2 - Medium Correlation 1 - Low Correlation

Title of the Course		CALCULUS					
Paper Number		CORE PAPER II					
Category	Core	Year	I	Credits	5	Course Code	
		Semester	I				
Instructional Hours per week	Lecture		Tutorial		Lab Practice		Total
	4		1		--		5
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		<ul style="list-style-type: none"> • The basic skills of differentiation, successive differentiation, and their applications. • Basic knowledge on the notions of curvature, evolutes, involutes and polar co-ordinates and in solving related problems. • Knowledge on integration and its geometrical applications, double, triple integrals and improper integrals. • Knowledge about Beta and Gamma functions and their applications. 					
Course Outline		<p>UNIT – I ::Successive Differentiation - n^{th} derivative, Standard results– Leibnitz Theorem(without Proof) and its applications</p> <p>UNITII:ENVELOPES- Methods of finding envelopes- Curvature– Circle, radius, Centre of Curvature – Involutives -Evolutes-Cartesian and Polar formula for the radius of curvature. Co-ordinates of Centre of Curvature Maxima and Minima functions of two variables,- Jacobians,</p> <p>UNITIII:INTEGRAL CALCULUS: Reduction formulae: Bernoulli's formula, $\int e^{ax} \cos bx \, dx$, $\int e^{ax} \sin bx \, dx$- $\int \sin^m x \cos^n x \, dx$ (m, n being positive integers), $\int x^m (\log x)^n \, dx$, $\int \cos^m x \cos nx \, dx$, $\int \cos^m x \sin nx \, dx$</p> <p>UNIT-IV:DOUBLE INTEGRALS (Cartesian co-ordinates only), Multiple Integrals - definition of double integrals - evaluation of double integrals -Change of order of integration. Triple integrals(Cartesian co-ordinates only)</p> <p>UNIT-V:BetaandGamma functions(Applicationstosimpleproblems)</p>					
Skills acquired from this course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					

Recommended Text	<ol style="list-style-type: none"> 1. H. Anton, I. Birens and S. Davis, Calculus, John Wiley and Sons, Inc., 2002. 2. G.B. Thomas and R.L. Finney, Calculus, Pearson Education, 2010. 3. “Calculus”, Vol-II b S.Narayanan and T.K.Manicavachagam pillai S.Viswanathan publishers–2007 4. D. Chatterjee, Integral Calculus and Differential Equations, Tata-McGraw Hill Publishing Company Ltd.
Reference Books	<ol style="list-style-type: none"> 1. R. Courant and F. John, Introduction to Calculus and Analysis (Volumes I & II), Springer- Verlag, New York, Inc., 1989. 2. T. Apostol, Calculus, Volumes I and II. 3. S. Goldberg, Calculus and mathematical analysis.
Website and e-Learning Source	https://nptel.ac.in

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total
25	75	100

Course Learning Outcome (for Mapping with PLOs and PSOs)

Students will be able to

CLO 1: Evaluate the nth derivative using Leibnitz Rule

CLO 2: Compute Radius and circle of curvature, Evolute and Maxima – Minima of two variables.

CLO 3 : Evaluate integral values by appropriate reduction formula.

CLO 4: Identify the multiple integral techniques and Evaluate.

CLO 5: Evaluate the indefinite integrals using the properties of Beta and Gamma functions.

	Pos						PSOs		
	1	2	3	4	5	6	1	2	3
CLO1	3	1	3	1	1	1	3	2	1
CLO2	3	1	3	1	1	-	3	2	1
CLO3	3	2	3	2	-	1	3	2	1
CLO4	3	2	3	2	1	-	3	2	1
CLO5	3	2	3	2	-	-	3	2	1

3 - Strong Correlation

2 - Medium Correlation

1 - Low Correlation

Title of the Course		WEB DESIGNING WITH HTML					
Paper Number		ELECTIVE COURSE I					
Category	ELECTIVE	Year	I	Credits	3	Course Code	
		Semester	I				
Instructional Hours per week		Lecture	Tutorial	Lab Practice	Total		
		3	-	1	4		
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		<ul style="list-style-type: none"> • Insert a graphic within a web page. • Create a link within a web page. • Create a table within a web page. • Insert heading levels within a web page. • Insert ordered and unordered lists within a web page. Create a web page. 					
Course Outline		UNIT I-Introduction to HTML – Opening for writing HTML – Unicode Transformation Format – HTML 5 Resources – What is different in HTML 5? - <DOCTYPE> in HTML 5					
		UNIT II-Designing a Webpage: Design Considerations and Planning – Basic Tags and Document structure – HTML Tags <HTML> ... </HTML> - Head Tags <HEAD> ... </HEAD> - Title Tags – Body Tags <BODY> ... </BODY> - Metadata – Saving an HTML document – Actions.					
		UNIT III-Formatting: Page Formatting – Adding a New Paragraph – Adding a Line Break – Inserting Blank Space – Preformatted Text – Changing a Page’s Background Color – Div Element - Text items and objects – Headings – Comments – Block Quotes – Horizontal Lines – Special Characters – Creating Lists – Numbered (Ordered) Lists – Bulleted (Unordered) Lists – Nested Lists- Definition Lists.					
		UNIT IV-Links: Introduction to Links – Text Links – Image Links – Opening a web page in a new window/Tab – Setting All Links on a page to open in a new window/Tab – Linking to an area on the same page (Bookmarks) – Linking to an E-mail Address – Linking to other types of Files.					
		UNIT V- Images: Introduction to Images: Adding Images – Resizing images – Alternative (ALT) Text – Image Labels. Tables: Introduction to Tables - Inserting a Table – Table Borders - Table Headers					

Practical Course Outline	<ol style="list-style-type: none"> 1. Write a program to illustrating the basic tags of HTML. 2. Write a program on Page formatting. 3. Write a program to illustrate paragraph tag. 4. Write a program to change background colour. 5. Write a program to create a list (Numbered (Ordered) Lists – Bulleted (Unordered) Lists). 6. To create a HTML file using special characters. 7. To create a HTML file containing hyper link. 8. Write a HTML program to display a table with 5 rows and 4 columns with appropriate heading. 9. Write a HTML code to design complex nested list. 10. Write a HTML code to develop a web page having two frames that divide the page into two equal rows and divide the first row into two columns.
Skills acquired from this course	<ol style="list-style-type: none"> 1. Learn the language of the web: HTML. 2. Understand the principles of creating an effective webpage. 3. Learn to embed other media links into webpages.
Recommended Text	<ol style="list-style-type: none"> 1. “Mastering HTML 5 and CSS 3 Made Easy”, Teach U Comp Inc., 2014. 2. Thomas Michaud, “Foundations of Web Design: Introduction to HTML & CSS”
Website and e-Learning Source	<ol style="list-style-type: none"> 1. https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf 2. https://www.w3schools.com/html/default.asp

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination		Total
	Theory	Practical	
25	50	25	100

Course Learning Outcomes(for Mapping with POs and PSOs)

Students will be able to

CLO1: Understand the basic concept in HTML. Concept of resources in HTML

CLO2: Create the Meta Data, Design concept & save the files.

CLO3: Understand page formatting and the concept of list.

CLO4: Creating Links and understand the concept of creating link to email address

CLO5: Create concepts by adding images.Understand the table creation.

	POs						PSOs		
	1	2	3	4	5	6	1	2	3
CLO1	3	2	1	-	3	2	2	2	2
CLO2	3	2	1	-	3	2	2	2	2
CLO3	3	2	1	1	3	2	2	2	2
CLO4	3	2	1	-	3	2	2	2	2
CLO5	3	2	1	-	3	2	2	2	2

3 - Strong Correlation

2 - Medium Correlation

1 - Low Correlation

SKILL ENHANCEMENT COURSE – I

MATHEMATICS FOR COMPETITIVE EXAMINATIONS-I

Title of the Course		MATHEMATICS FOR COMPETITIVE EXAMINATIONS-I					
Paper Number		ELECTIVE (S EC2)					
Category	Core	Year	I	Credits	2	Course Code	
		Semester	I				
Instructional Hours per week	Lecture		Tutorial		Lab Practice		Total
	2		--		--		2
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		After taking the course, <ul style="list-style-type: none"> • The student will able to answer the questions related to the number system. • The student will able to answer real life simple problems by using HCF and LCM. • The student will able to apply the correct sequence of operations to find out the value of a given mathematical expressions. • The student will able to solve the problem involving square roots, cube roots and average. • The student will able to carry out the problems related to age and simple product. 					
Course Outline		Using R Programming develop the programmes in the following topics:					
		Unit I: Number System.				Hours: 6	
		Unit II: H.C.F and L.C.M of numbers , Decimal Fractions.				Hours: 6	
		Unit III: Simplification.				Hours: 6	
		Unit IV: Square root and Cube Roots, Averages.				Hours: 6	
		Unit V: Problems on numbers, Problems on Age, Surds and Indices.				Hours: 6	

Extended Professional Component (is a part of internal component only, Not to be included in the External Examination question paper)	Questions related to the above topics, from various competitive examinations UPSC / TNPSC / others to be solved (To be discussed during the Tutorial hour)
Skills acquired from this course	Knowledge, problem solving, analytical ability, professional competency, professional communication and transferable skill.
Recommended Text	1. R.S. Aggarwal [2017], Quantitative Aptitude for Competitive Examinations, S.Chand and Company , New Delhi. Chapters 11-13, 18, 19, 22, 23
Reference Books	1. Praveen R.V, Quantitative Aptitude and reasoning ,PHI Learning Pvt, New Delhi.

Course Learning Outcome (for Mapping with POs and PSOs)

Students will be able to

CLO1: Solve Mathematical Problems using Mathematical formulae.

CLO2: Understand the knowledge of application of Mathematics

CLO3: Understand the concepts of simplification.

CLO4: Calculate the square root and cube root.

CLO5: Solve the problems on age.

	Pos						PSOs		
	1	2	3	4	5	6	1	2	3
CLO1	3	1	3	2	2	-	3	2	1
CLO2	2	1	3	1	2	-	3	2	1
CLO3	3	1	3	1	2	-	3	2	1
CLO4	3	1	3	2	2	-	3	2	1
CLO5	3	1	3	2	3	-	3	2	1

Title of the Course		Foundation course - Bridge Mathematics					
Paper Number		FOUNDATION 1					
Category	Core	Year	I	Credits	2	Course Code	FC
		Semester	I				
Instructional Hours per week		Lecture	Tutorial	Lab Practice	Total		
		2	-	--	2		
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		<p>To bridge the gap and facilitate transition from higher secondary to tertiary education;</p> <p>To instil confidence among stakeholders and inculcate interest for Mathematics. Hours: 6</p>					
Course Outline		UNIT-I: Algebra: Binomial theorem, General term, middle term, problems based on these concepts. Hours: 6					
		Unit II: Sequences and series (Progressions). Fundamental principle of counting. Factorial n. Hours: 6					
		Unit III: Permutations and combinations, Derivation of formulae and their connections, simple applications, combinations with repetitions, arrangements within groups, formation of groups. Hours: 6					
		Unit IV: Trigonometry: Introduction to trigonometric ratios, proof of $\sin(A+B)$, $\cos(A+B)$, $\tan(A+B)$ formulae, multiple and sub multiple angles, $\sin(2A)$, $\cos(2A)$, $\tan(2A)$ etc., transformations sum into product and product into sum formulae, inverse trigonometric functions, sine rule and cosine rule. Hours: 6					
		Unit V: Calculus: Limits, standard formulae and problems, differentiation, first principle, uv rule, u/v rule, methods of differentiation, application of derivatives, integration - product rule and substitution method. Hours: 6					
Recommended Text		<p>1. NCERT class XI and XII text books.</p> <p>2. Any State Board Mathematics text books of class XI and XII</p>					

