HAJEE KARUTHA ROWTHER HOWDIA COLLEGE

(An Autonomous Institution Affiliated to Madurai Kamaraj University, Madurai.)
Re-Accredited with A++ Grade by NAAC (3rd Cycle)
Uthamapalayam - 625 533.

DEPARTMENT OF

MATHEMATICS

PART IV - MATHEMATICS

SYLLABUS

Choice Based Credit System – CBCS

(As per TANSCHE)

With

Outcome Based Education (OBE)

(Academic Year 2023 -2026)

Semester-I

Course Category	Course Code	Course Title	Hrs	CIAE	TEE	Max Marks	Credits
Part – IV	23UMASE11	Mathematics for Competitive Examinations – I (NME)	2	25	75	100	2
	23UMAFN11	Bridge Mathematics	2	25	75	100	2

Semester-II

Course Category	Course Code	Course Title	Hrs	CIAE	TEE	Max Marks	Credits
Part – IV	23UMASE21	Mathematics for Competitive Examinations – II (NME)	2	25	75	100	2
	23UMASE2P	LaTeX	2	40	60	100	2

Semester-III

Course Category	Course Code	Course Title	Hrs	CIAE	TEE	Max Marks	Credits
Part – IV	23UMASE3P	Statistics with EXCEL	1	40	60	100	1
	23UMASE3Q	Office Automation	2	40	60	100	2
	23UGEVS41	Environmental Studies	1	-	-	-	-

Semester-IV

Course Category	Course Code	Course Title	Hrs	CIAE	TEE	Max Marks	Credits
Part – IV	23UMASE41	Mathematical Aptitude	2	25	75	100	2
	23UMASE4P	Web Designing	2	40	60	100	2
	23UGEVS41	Environmental Studies	1	25	75	100	2

Semester-V

Course Category	Course Code	Course Title	Hrs	CIAE	TEE	Max Marks	Credits
Part – IV	23UGVED51	Value Education	2	25	75	100	2
	23UMAIS51	Internship / Industrial Training	-	-	-	-	2

Semester-VI

Course Category	Course Code	Course Title	Hrs	CIAE	TEE	Max Marks	Credits
Part – IV	23UMASE6P	Computational Mathematics	2	40	60	100	2

Course Code	Course Title	Category	Credits	Hours	Marks		
					CIAE	TEE	Total
23UMASE11	MATHEMATICS FOR COMPETITIVE EXAMINATIONS-I (NME)	NME	2	2	25	75	100

Learning Objectives		
L1	Develop problem-solving skills for competitive examinations.	
L2	Understand the concepts of averages, simple interest, compound interest, time and work, profit and loss, and problems on numbers.	
L3	Apply mathematical concepts to solve problems related to competitive examinations.	
UNIT	**Contents**	**No. of Hours**
I	Simplifications - Averages – concepts – problems.	6
II	Problems on numbers - short cuts – concepts – problems.	6
III	Profit and Loss - short cuts – concepts – problems.	6
IV	Time and work - short cuts – concepts - problems.	6
V	Simple Interest - Compound interest – concepts – problems.	6
	Total	**30**

Course Outcomes		Knowledge Level
CO	**On completion of this course, students will**	
1	Apply simplification and average skills to solve problems in competitive examinations.	K1,K2,K3,K4,K5
2	Understand the concepts of simple interest and compound interest.	K1,K2,K3,K4,K5
3	Understand the concepts of time and work.	K1,K2,K3,K4,K5
4	Use formulas to calculate profit/loss percentages and break-even points.	K1,K2,K3,K4,K5
5	Solve problems related to HCF and LCM.	K1,K2,K3,K4,K5

Textbooks	
1.	Quantitative Aptitude" by R.S.Aggarwal, S.Chand& Company Ltd., Ram Nagar, New Delhi (2007) **Unit I:** Chapter 4 & 6 **Unit II**: Chapter 7 **Unit III:** Chapter 12 **Unit IV** :Chapter 17
Reference Books	
1.	U. Mohan Rao, Quantitative Aptitude for Competitive Examinations, Scitech Publications, 2016.
2.	Dr.M.Manoharan, Dr.C.Elango and Prof K.L.Eswaran, Business Mathematics, Palani paramount Publications, Reprint 2013
Web Resources	
1.	https://tamilnaducareerservices.tn.gov.in/

Mapping with Programme Outcomes:

CO /PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	3	2	3	2	1	1	-	-
CO 2	3	2	3	2	2	1	-	-
CO 3	3	2	3	2	1	1	-	-
CO 4	3	2	3	2	1	1	-	-
CO 5	3	2	3	2	1	1	-	-

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	-	-
CO2	3	2	1	-	-
CO3	3	3	1	-	-
CO4	3	2	1	-	-
CO5	3	3	1	-	-

Strong-3 Medium-2 Low-1

Course Code	Course Title	Category	Credits	Hours	Marks		
					CIAE	TEE	Total
23UMAFN11	BRIDGE MATHEMATICS	FC	2	2	25	75	100

Learning Objectives		
L1	To bridge the gap and facilitate transition from higher secondary to tertiary education.	
L2	To instill confidence among stake holders and inculcate interest for Mathematics.	
UNIT	**Contents**	**No. of Hours**
I	**Algebra:** Binomial theorem, General term, middle term, problems based on these concepts**.**	6
II	**Sequences and series (Progressions).** Fundamental principle of counting. Factorial n.	6
III	**Permutations and combinations**, Derivation of formulae and their connections, simple applications, combinations with repetitions, arrangements within groups, formation of groups.	6
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**.**	6
V	**Calculus:** Limits, standard formulae and problems, differentiation, rest principle, uv rule, u/v rule, methods of differentiation, application of derivatives, integration – product rule and substitution method.	6
	Total	**30**

Course Outcomes		Knowledge Level
CO	**On completion of this course, students will**	
1	Prove the binomial theorem and apply it to find the expansions of any $(x + y)^n$ and also, solve the related problems**.**	K1,K2,K3,K4,K5
2	Find the various sequences and series and solve the problems related to them. Explain the principle of counting**.**	K1,K2,K3,K4,K5
3	Find the number of permutations and combinations in different cases. Apply the principle of counting to solve the problems on permutations and combinations**.**	K1,K2,K3,K4,K5
4	Explain various trigonometric ratios and find them for different angles, including sum of the angles, multiple and sub multiple angles, etc. Also, they can solve the problems using the transformations.	K1,K2,K3,K4,K5
5	Find the limit and derivative of a function at a point, the definite and indefinite integral of a function and find the	K1,K2,K3,K4,K5

	points of min/max of a function.	
Textbooks		
1.	NCERT class XI and XII text books.	
2.	Any State Board Mathematics text books of class XI and XII	
Web Resources		
1.	https://www.aicte-india.org/sites/default/files/final%20maths.pdf	
2.	https://egyankosh.ac.in/bitstream/123456789/13834/1/Unit-1.pdf	

Mapping with Programme Outcomes:

CO /PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	1	1	1	1	1	1	-	-
CO 2	2	1	1	2	2	1	-	-
CO 3	2	1	1	2	2	1	-	-
CO 4	1	1	1	1	1	1	-	-
CO 5	1	1	1	1	1	1	-	-

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	-	-
CO2	2	1	2	-	-
CO3	2	1	2	-	-
CO4	2	1	1	-	-
CO5	2	1	1	-	-

Strong-3 Medium-2 Low-1

Course Code	Course Title	Category	Credits	Hours	Marks		
					CIAE	TEE	Total
23UMASE21	MATHEMATICS FOR COMPETITIVE EXAMINATIONS-II (NME)	NME	2	2	25	75	100

Learning Objectives		
L1	Develop the problem solving skills for competitive examinations.	
L2	Understand the concepts of Surds, Indices, Percentage, Ratio and Proportions, Time and Distance, Permutations and Combination, Probability.	
L3	Apply mathematical concepts to solve problems related to competitive examinations.	
UNIT	**Contents**	**No. of Hours**
I	Problems on ages – Surds and indices-concepts –Solved problems	6
II	Percentage – Ratio and Proportions – concepts – Solved problems	6
III	Time and distance –Problems on trains- concepts - Solved problems	6
IV	Calendar and Clock - short cuts – concepts – Solved problems	6
V	Permutation and combinations-Probability– concepts - Solved problems	6
	Total	**30**

Course Outcomes		Knowledge Level
CO	**On completion of this course, students will**	
1	Understand the concepts of Problems on ages – Surds and indices.	K1,K2,K3,K4,K5
2	Understand the concepts of Percentage – Ratio and Proportions.	K1,K2,K3,K4,K5
3	Understand the concepts of time and distance, problem on trains .	K1,K2,K3,K4,K5
4	Solve problems in calendar and clock .	K1,K2,K3,K4,K5
5	Solve problems in Permutation and combination, Probability.	K1,K2,K3,K4,K5

Textbooks	
1.	Quantitative Aptitude by R.S.Aggarwal, S.Chand& Company Ltd., Ram Nagar, New Delhi (2007) **Unit I:** Chapter 8 , 9 **Unit II**: Chapter 10,12 **Unit III:** Chapter 17,18 **Unit IV** :Chapter 27,28 **Unit V** :Chapter 30,31
Reference Books	

1.	U. Mohan Rao, Quantitative Aptitude for Competitive Examinations, Scitech Publications, 2016.
2.	Dr.M.Manoharan, Dr.C.Elango and Prof K.L.Eswaran, Business Mathematics, Palani paramount Publications, Reprint 2013
Web Resources	
1.	https://tamilnaducareerservices.tn.gov.in/

Mapping with Programme Outcomes:

CO /PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	3	2	3	2	1	1	-	-
CO 2	3	2	3	2	-	1	-	-
CO 3	3	2	3	2	-	1	-	-
CO 4	3	2	3	2	1	1	-	-
CO 5	3	2	3	2	1	1	-	-

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	-	-
CO2	3	2	1	-	-
CO3	3	3	1	-	-
CO4	3	2	1	-	-
CO5	3	3	1	-	-

Strong-3 Medium-2 Low-1

Course Code	Course Title	Category	Credits	Hours	Marks		
					CIAE	TEE	Total
23UMASE2P	LATEX	SEC	2	2	40	60	100

Learning Objectives		
L1	To enable the students to acquire knowledge in basic concepts of LaTeX.	
L2	To get knowledge to prepare sample reports, sample articles, sample presentation and sample poster.	
UNIT	Contents	No. of Hours
I	**Preamble:** Motivation - Running LaTeX - Resources – Basic LaTeX- Sample Document and Key Concepts - Type Style - Environments-Lists-Centering -Tables –Verbatim - Vertical And Horizontal Spacing.	6
II	**Typesetting Mathematics** - Examples - Equation Environments - Fonts, Hats, and Underlining – Braces – Arrays and Matrices- Customized Commands -Theorem-like Environments – Math Miscellany – Math Styles–Bold Math-Symbols for Number Sets - Binomial Coefficient.	6
III	**Further Essential LaTeX :** Document Classes and the Overall Structure-Titles for Documents – Sectioning Commands – Miscellaneous Extras-Spacing – Accented Characters –Dashes And Hyphens –Quotation Marks-Troubleshooting – Pinpointing the Error-Common Errors-Warning Messages.	6
IV	**Packages** – Inputting Files – Inputting Pictures – Making a Bibliography – Making an Index – Latex through the years.	6
V	**Sample Article** – Sample Report – Sample presentation - Sample Poster – Internet Resources.	6
	Total	30

Course Outcomes		Knowledge Level
CO	On completion of this course, students will	
1	Learn LaTeX.	K1,K2,K3,K4
2	Typesetting Mathematics.	K1,K2,K3,K4,K5,K6
3	Know the essential of LaTeX, Document Classes and the Overall Structure.	K1,K2,K3,K4,K5,K6
4	Know the packages, Inputting Files, Inputting Pictures, Making a Bibliography.	K1,K2,K3,K4,K5,K6
5	Prepare the Sample Article, Sample Report, Sample presentation and Sample Poster.	K1,K2,K3,K4,K5,K6

Textbooks	
1.	Learning LaTeX : David F. Griffiths, Desmond J. Higham. - SIAM -Society for Industrial and Applied Mathematics, Philadelphia.
Reference Books	
1.	A Guide to LaTeX,Helmut Kopka Patrick W. Daly, Electronic Publishing (Fourth

	edition) ©Addison Wesley Longman Limited 2004.
2.	LaTeX Tutorials, APRIMER, Indian TEX Users Group, Trivandrum, India 2003 September.
3.	LaTeX Beginner's Guide, Stefan Kottwitz, Published by Packt Publishing Ltd.32 Lincoln Road Olton,Birmingham,B276PA,UK.
Web Resources	
1.	Over leaf:https://www.overleaf.com/
2.	Share LaTeX:https://www.sharelatex.com/
3.	LaTeX Wikibook:https://en.wikibooks.org/wiki/LaTeX

Mapping with Programme Outcomes:

CO /PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	3	2	1	3	2	-	-	-
CO 2	3	2	1	2	1	-	-	-
CO 3	3	2	1	3	1	-	-	-
CO 4	3	2	1	2	1	-	-	-
CO 5	3	2	1	3	1	-	-	-

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	-	-
CO2	3	2	1	-	-
CO3	3	3	1	-	-
CO4	3	2	1	-	-
CO5	3	3	1	-	-

Strong-3 Medium-2 Low-1

Course Code	Course Title	Category	Credits	Hours	Marks		
					CIAE	TEE	Total
23UMASE3P	STATISTICS WITH EXCEL	SEC	1	1	40	60	100

Learning Objectives		
L1	To Acquire Knowledge in Statistical Analysis System software carrying out some simple statistical analysis with EXCEL.	
UNIT	**Contents**	**No. of Hours**
I	Creating a Worksheet, Copying the formula	2
II	Creating Chart in Excel, Worksheet fitting on a Page	2
III	Typing with Auto Fill, Changing the size of Rows & Columns, Adding and Deleting Rows & Columns	2
IV	Functions in excel and Sort & Filter.	2
V	Calculate the Average, Median and mode.	2
VI	Calculate Sample Standard Deviation	2
VII	Calculate sample variance.	2
VIII	Print results	1
	Total	**15**

Course Outcomes		Knowledge Level
CO	On completion of this course, students will	
1	Understand Statistical tools, functions, formulas are available in Excel.	K1,K2,K3,K4
2	Analyze Statistical data using MS-Excel.	K1,K2,K3,K4,K5,K6
3	Organize, manage and present data in MS-Excel.	K1,K2,K3,K4,K5,K6
4	Knowledge about MS-Excel and its date representation diagrammatically.	K1,K2,K3,K4,K5,K6
5	Ability to compute relative measures of central tendency and dispersion.	K1,K2,K3,K4,K5

Textbooks	
1.	Dinesh Maidasani, 3rd Edition, Learning Computer Fundamentals, MS Office and Internet & Web Technology – Firewall Media, 2016
2.	Adam Ramirez, EXCEL Formulas and Functions, Caprioru Publishers
Reference Books	
1.	**Nellaikannan,C.,"MSOFFICE" Nels Publication, thirdedition**
2.	Naveen Mishra, EXCEL with Microsoft Excel, Penman publishers.
Web Resources	
1.	https://nptel.ac.in

Mapping with Programme Outcomes:

CO /PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	3	2	1	2	2	-	-	-
CO 2	3	2	2	1	2	-	-	-
CO 3	3	2	1	1	2	-	-	-
CO 4	3	2	2	2	2	-	-	-
CO 5	3	2	1	1	2	-	-	-

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	-	-
CO2	3	2	1	-	-
CO3	3	2	1	-	-
CO4	3	2	1	-	-
CO5	3	2	1	-	-

Strong-3 Medium-2 Low-1

Course Code	Course Title	Category	Credits	Hours	Marks		
					CIAE	TEE	Total
23UMASE3Q	OFFICE AUTOMATION	SEC	2	2	40	60	100

Learning Objectives		
L1	The Objective is to learn numerous advance MS Word, Excel, Power Point and Outlook features	
UNIT	Contents	No. of Hours
I	Creating, editing, saving and printing text documents, Font and paragraph formatting, Simple character formatting	3
II	Inserting tables, smart art, page breaks, Using lists and images and working with images	3
III	Using spelling and grammar check, Understanding document properties	3
IV	Spreadsheet basics, Creating, editing, saving and printing spreadsheets, Working with function and formulas	3
V	Modifying worksheets with colour and auto formats, Graphically representing data: Charts, Graphs	3
VI	Speeding data entry: Using Data forms, Analyzing data: Data menu, Subtotal, Filtering Data, Formatting worksheets,	3
VII	Opening, viewing, creating and printing slides, Applying auto layouts	3
VIII	Adding custom animation, Using slide transitions,	3
IX	Graphically representing data: Charts, Graphs, Creating professional slide for presentation	3
X	Understanding how to search / Google, Find a specific website, Copy and paste internet content into your word file and emails	3
	Total	**30**

Course Outcomes		Knowledge Level
CO	On completion of this course, students will	
1	Create file and folder and select to save the document.	K1,K2,K3,K4
2	Select spell for Grammar check and save the document	K1,K2,K3,K4,K5,K6
3	Classify work sheet and analyzing data.	K1,K2,K3,K4,K5,K6
4	Choose text using text effect and apply a graphic presentation	K1,K2,K3,K4,K5,K6
5	Identify basic navigation tools used in browsers.	K1,K2,K3,K4,K5

Textbooks	
1.	Dinesh Maidasani, 3rd Edition, Learning Computer Fundamentals, MS Office and Internet & Web Technology – Firewall Media, 2016.
2.	Nellaikannan,C.,"MS OFFICE"Nels Publication, third edition
Reference Books	
1.	Jennifer Ackerman Kettel, Guy Hat-Davis, Curt Simmons, "Microsoft 2003", Tata McGrawHill.

2.	Peter Norton, "Introduction to Computers"–Tata McGraw-Hill.
Web Resources	
1.	https://nptel.ac.in

Mapping with Programme Outcomes:

CO /PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	3	2	1	2	2	-	-	-
CO 2	3	2	2	1	2	-	-	-
CO 3	3	2	1	1	2	-	-	-
CO 4	3	2	2	2	2	-	-	-
CO 5	3	2	1	1	2	-	-	-

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	-	-
CO2	3	2	1	-	-
CO3	3	2	1	-	-
CO4	3	2	1	-	-
CO5	3	2	1	-	-

Strong-3 Medium-2 Low-1

Course Code	Course Title	Category	Credits	Hours	Marks		
					CIAE	TEE	Total
23UMASE41	MATHEMATICAL APTITUDE	SEC	2	2	25	75	100

Learning Objectives		
L1	Develop problem-solving skills for competitive examinations	
L2	Understand the concepts of averages, simple interest, compound interest, time and work, profit and loss ,and problems on numbers	
L3	Apply mathematical concepts to solve problems related to competitive examinations.	
UNIT	**Contents**	**No. of Hours**
I	Simplifications -Averages–concepts – solved examples.	6
II	Problems on numbers-Problems on ages-shortcuts–concepts–solved examples.	6
III	Profit and Loss–Ratio & proportion-shortcuts–concepts-solved examples.	6
IV	Partnership-Time and work-shortcuts–concepts-solved examples.	6
V	Time and distance-Problem on trains –concepts-solved examples.	6
	Total	**30**

Course Outcomes		Knowledge Level
CO	**On completion of this course, students will**	
1	Apply simplification and average skills to solve problems in competitive examinations.	K1,K2,K3,K4
2	Understand the concepts of ages and numbers.	K1,K2,K3,K4,K5,K6
3	Use formulas to calculate profit/loss percentages and proportion	K1,K2,K3,K4,K5,K6
4	Understand the concepts of partnership and time and work	K1,K2,K3,K4,K5,K6
5	Understand the concepts of Time and distance, problem on trains.	K1,K2,K3,K4,K5

Textbooks	
1.	"Quantitative Aptitude" by R.S.Aggarwal, S.Chand& Company Ltd., Ram Nagar, New Delhi(2007) **Unit I:** Chapter 4 & 6 **Unit II**: Chapter7&8 **Unit III:** Chapter 11&12 **Unit IV**: Chapter13&15 **UnitV**:Chapter17&18
Reference Books	
1.	U. Mohan Rao, Quantitative Aptitude for Competitive Examinations, ScitechPublications,2016.
2.	Dr. M. Manoharan, Dr. C.Elango and Prof K.L.Eswaran, Business Mathematics,Palanipara mount Publications,Reprint2013
Web Resources	
1.	https://nptel.ac.in

Mapping with Programme Outcomes:

CO /PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	3	2	3	2	1	-	-	-
CO 2	3	2	3	2	1	-	-	-
CO 3	3	2	3	2	1	-	-	-
CO 4	3	2	3	2	1	-	-	-
CO 5	3	2	3	2	1	-	-	-

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	-	-
CO2	3	2	1	-	-
CO3	3	3	1	-	-
CO4	3	2	1	-	-
CO5	3	3	1	-	-

Strong-3 Medium-2 Low-1

Course Code	Course Title	Category	Credits	Hours	Marks		
					CIAE	TEE	Total
23UMASE4P	**WEB DESIGNING**	**SEC**	**2**	**2**	**40**	**60**	**100**

Learning Objectives		
L1	Understand HTML and Knowledge to effectively implement it in the Web Environment.	
L2	Able to Designing web pages with Table, frames, forms and various features using HTML.	
UNIT	**Contents**	**No. of Hours**
I	Create Simple Web page for Text Formatting.	4
II	Working with colours	4
III	Create Web Page with Hyper Links.	4
IV	Create Web Page with Image.	2
V	Web Page with ordered and unordered Lists.	2
VI	Web Page with unordered Lists.	2
VII	Web Page with Definition Lists.	2
VIII	Web Page with Table.	2
IX	To design a Time Table using HTML	2
X	To Design Form.	2
XI	To Design a frame to display different in one web page.	2
XII	College Website Creation	2
	Total	**30**

Course Outcomes		**Knowledge Level**
CO	**On completion of this course, students will**	
1	Studying HTML to develop web page.	K1,K2,K3,K4
2	Understand the principles of creating an effective web page.	K1,K2,K3,K4,K5,K6
3	Learn techniques of web design, form design, table design.	K1,K2,K3,K4,K5,K6
4	Understand how to plan and conduct user research related to web usability.	K1,K2,K3,K4,K5,K6
5	Develop skills in analysing the social sites	K1,K2,K3,K4,K5

Textbooks	
1.	L.Mathu Kiruthigha Venketesh, Web Technology, Margham publication..
2.	Sean mcmanus,Web Design in easy steps,Tata Mcgraw-hill,5th edition.
Reference Books	
1.	Laura Lemay,Rafe Colburn,Jennifer Kyrnin,Mastering HTML,CSS&Java Script web publishing,BPB publication -2016
Web Resources	
1.	https://nptel.ac.in

Mapping with Programme Outcomes:

CO /PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	3	2	1	2	1	-	-	-
CO 2	3	2	2	1	1	-	-	-
CO 3	3	2	1	1	1	-	-	-
CO 4	3	2	2	2	1	-	-	-
CO 5	3	2	1	1	1	-	-	-

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	-	-
CO2	3	2	1	-	-
CO3	3	2	1	-	-
CO4	3	2	1	-	-
CO5	3	2	1	-	-

Strong-3 Medium-2 Low-1

Course Code	Course Title	Category	Credits	Hours	Marks		
					CIAE	TEE	Total
23UMASE6P	COMPUTATIONAL MATHEMATICS	SEC	2	2	40	60	100

Learning Objectives		
L1	Problem solving and Programming capability using SageMath.	
UNIT	Contents	No. of Hours
I	1.Constructing factors and Matrix Using SageMath. 2.Calculating LCM and HCF Using SageMath. 3.Calculating Eigen Values and Eigen Vectors using SageMath. 4. Mean, Median, Mode in SageMath. 5. Exploring Integers in SageMath.	6
II	6.Typing Mathematical Expressions using Assignment inequality and Arithmetic Operations 7. Express Mathematical functions Using SageMath. 8. Construct the Tangent function Using SageMath. 9. To find the natural logarithm of the real number 2. 10.Solve the $9^{\times 9}$ Sudoku Puzzle defined by the matrix Using SageMath	6
III	11. Working with vectors in SageMath. 12. To solve equations Using SageMath. 13. Construct a Program for Differentiation and Integration. 14. Solving Differential Equations 15. Write a Program for Standard set theoretic Operations.	6
IV	16. Solving Quadratic equations and finding Roots 17.Defining a function to convert from rectangular co ordinates to polar coordinates Using SageMath. 18. Plotting the Equations in a Graph. 19. Finding the area b/w two 2D curves and plotting it 20.Finding the points on the sphere that are closest and farthest from the point.	6
V	21.Typing Equation of Elliptic Curve and find the square of numbers Using SageMath. 22. Improper Integrals Using SageMath. 23. Interpolation in SageMath. 24. Numerical Interpolation in SageMath. 25. Results in L.P.P Using SageMath.	6
	Total	**30**

Course Outcomes		Knowledge Level
CO	On completion of this course, students will	
1	Deal with Symbolic Variables	K1,K2,K3,K4
2	Describe the symbolic expressions and some Pitfalls	K1,K2,K3,K4,K5,K6
3	Demonstrates the analysis concepts	K1,K2,K3,K4,K5,K6
4	Solve the simultaneous equations	K1,K2,K3,K4,K5,K6

5	Displaying the solutions of Differential Equations	K1,K2,K3,K4,K5
Textbooks		
1.	Gregory V. Bard;Sage for Undergraduates (online version)	
2.	Craig Finch; Sage Biginner's Guide; PACKT Publishing (Open Source)	
Reference Books		
1.	https://onlinecourses.nptel.ac.in/noc21_ma29/preview	
2.	https://mosullivan.sdsu.edu/Teaching/sdsu-sage-tutorial/sageprog.html	
Web Resources		
1.	https://nptel.ac.in	

Mapping with Programme Outcomes:

CO /PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	1	3	2	1	-
CO 2	2	1	3	1	1	-
CO 3	3	2	3	1	1	-
CO 4	1	2	3	2	1	-
CO 5	3	1	2	1	1	-

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	-	-
CO2	3	2	1	-	-
CO3	3	2	1	-	-
CO4	3	2	1	-	-
CO5	3	2	1	-	-

Strong-3 Medium-2 Low-1