

Department : Mathematics
Name of the course : E-MATHEMATICAL TOOLS
 [UGC Approval No. F.No. 4 – 442/2010 (COP). Dt. 22.03.2010]

COURSE CODE	COURSE	COURSE TITLE	TEACHING HOURS	CREDIT	CIA MARKS	SE MARKS	TOTAL MARKS
CERTIFICATE COURSE							
14MACT1	CORE I	MS Office	150	10	40	60	100
14MACT2	CORE II	LATEX (THEORY)	150	10	40	60	100
14MACT3:P	CORE III	LATEX(PRACTICAL)*	150	10	40	60	100
TOTAL			450	30	120	180	300
DIPLOMA PROGRAMME							
14MADM1	CORE I	Web Designing	150	10	40	60	100
14MADM 2	CORE II	MATLAB (Theory)	150	10	40	60	100
14MADM3:P	CORE III	MATLAB(Practical)*	150	10	40	60	100
TOTAL			450	30	120	180	300
GRAND TOTAL			900	60	240	360	600
ADVANCED DIPLOMA PROGRAMME							
14MAAD1	CORE I	Statistics	150	10	40	60	100
14MAAD2	CORE II	SPSS Package	150	10	40	60	100
14MAAD3:P	CORE III	Statistics Practicals Using Spss Package*	150	10	40	60	100
TOTAL			450	30	120	180	300
GRAND TOTAL			1350	90	360	540	900

*Practical Examinations will be conducted at the end of the year

CERTIFICATE COURSE IN E-MATHEMATICAL TOOLS
CORE I
MS OFFICE

Course Code : 14MACT1
Hours/Week: 10
Credit : 10

Max. Marks : 100
Internal Marks : 40
External Marks : 60

Objective:

To develop the computer skills and understand the MS Word, Power Point presentation and Spread Sheets.

UNIT I**30 hours**

MS- Word: starting word – Creating Documents – Parts of word window – Mouse operations – Keyboard operations – Formatting features – Menus, Command, Toolbars and Icons - Word formatting toolbar – Word tables and borders toolbar – Word drawing toolbar.

UNIT II**30 hours**

Starting MS Word - Word exercise – Mail Merge - Creating the main document – Creating data source – Adding fields – Removing fields – Macros – Inserting Header and Footer – Inserting Current Date, Time and Page Number – Recording Macros –Creating table –Fonts and Points sizes – Shading.

UNIT III**30 hours**

MS-Power Point: Menus – Toolbar: Power point Standard Toolbar - Power point Formatting Toolbar - Power point Drawing Toolbar – Navigation in Power Point –Creating New presentation – Opening a presentation – Creating a new slide – Deleting a slide – Copying a Slide – Slide numbering – Saving a presentation- Closing presentation- Change the default Directory – Auto save – Printing a Presentation.

UNIT IV**30 hours**

Working power point – Starting power point – First screen – Changing font, font size and bold – Moving the frame and inserting clip art – Insert picture – Insert a New slide –Copying picture from previous slide – Sizing box – Entering data graph – Design template – Master Slide – Colour box – Saving the Presentation.

UNIT V**30 hours**

MS –Excel: Navigation – Selecting cells – Entering and Editing text – Entering Numbers –Entering Formulas – Entering Dates – Menus –Toolbars – Icons – Entering text in cells – Columns width – Alternate Method – Entering formula –Summation –Formatting cells – Currency notation – Centering across selection – Column Autofit – Insert row and column.

Text Book:

Sanjay Saxen, MS Office 2000 for Everyone, VIKAS PUBLISHING HOUSE PVT LTD (2010).

Books for Reference:

1. Maria, MS Office 2000 Training Guide, BPB Publications (2013).
2. John Walkenbach Herb Toyson, MS Office 2010, Bible Publications (2010).

CORE II
LATEX (Theory)

Course Code : 14MACT2
Hours/Week: 10
Credit : 10

Max. Marks : 100
Internal Marks: 40
External Marks: 60

Objective:

To develop the typesetting knowledge in Mathematical formulae and inserting graphs in text using LATEX.

UNIT I**30 hours**

The Basics: What is LATEX? – Simple typesetting – Fonts – Type size. The Document: Document class – Page style – Page numbering – Formatting – Lengths – Parts of a document - Dividing the Document.

UNIT II**30 hours**

Table of contents, Index and Glossary: Table of contents – Index – Glossary. Displayed Tex. – Borrowed words - Poetry in typesetting –Making lists – When order matters – Descriptions. Rows and Columns: Keeping tabs – Tables.

UNIT III**30 hours**

Typesetting Mathematics: Basics – Custom commands – More on mathematics – miscellany – New operators – The many faces of mathematics - And that is not all! Symbols. Typesetting Theorems: Theorems in LATEX – Designer theorems – The amsthm package – Housekeeping.

UNIT IV**30 hours**

Several kinds of boxes: LR boxes – Paragraph boxes – Paragraph boxes with specific height – Nested boxes – Rule boxes. Floats: The figure environment – The table environment.

UNIT V**30 hours**

Cross References in LATEX: Why cross references? – Let LATEX do it – pointing to a page – the package varioref – Pointing outside – the package xr – Lost the keys? Use Lablst.tex. Footnotes, Margin pars and Endnotes: Footnotes – Marginal notes – Endnotes.

Text Book:

LATEX Tutorial, A PRIMER –Trivandrum, India (2003).

Books for Reference:

1. Tobias Oetiker Hubert Partl, Irene Hynne and Elisabeth Schlegl, "The Not So Short, Introduction to LATEX2 or LATEX2" Version 3.3, 8. January (1999).
2. LaTeX, Wikibooks contributors, Platypus Global Media e-book (2011).

CORE III
LATEX (Practical)

Course Code : 14MACT3:P

Hours/Week: 10

Credit : 10

Max. Marks : 100

Internal Marks: 40

External Marks: 60

Objective:

To develop the computer skills and to get the experience in LATEX.

List of Practical

1. To create two paragraphs with a heading using LATEX.
2. To prepare a page with four paragraphs. First containing single and double quoted words. Second contains an italic word, third contains some sashes and accents and fourth contains some symbols.
3. To prepare a conduct certificate given by the Principal of Jamal Mohamed College.
4. To typeset a given Poetry.
5. To prepare labeled items containing bullets, dashes, stars and dots.
6. To prepare some Statistical table.
7. To prepare a multi table for some planets and its distances.
8. To typeset some vague mathematical formula like formula for correlation coefficient.
9. To typeset the system of equations and the corresponding matrix form.
10. To typeset formula for binomial expansion and Christoffel's symbols.
11. To typeset for theorem, lemma, prepositions and corollary using LATEX.
12. To prepare a nested box and type some text with the box and outside the inner box.
13. To create a floating picture using Latex.
14. Use of ref. to pointing a sec. no., lemma no. and page no.
15. Use the foot note and endnote in LATEX

Text Book:

“LATEX Tutorial”, A PRIMER-Indian TEX users Group, Trivandrum, India (2003).

DIPLOMA PROGRAMME IN E-MATHEMATICAL TOOLS

CORE I

WEB DESIGNING

Course Code : 14MADM1

Hours/Week: 10

Credit : 10

Max. Marks : 100

Internal Marks : 40

External Marks : 60

Objective:

To develop the knowledge in designing Web sites using html.

UNIT I

30 hours

Introduction to internet: Computers in Business – Networking – Internet – Electronic mail – Resource sharing – World Wide Web – Usenet – Telnet.

UNIT II

30 hours

Internet Technologies: Modem – Internet Addressing – Physical Connections – Telephone lines.

UNIT III

30 hours

Internet Browsers: Internet Explorer – Netscape Navigator. Introduction to HTML: Designing a Home page – History of HTML – HTML Generations– HTML documents – Anchor tag – Hyper links – Sample HTML documents.

UNIT IV

30 hours

Head and Body sections: Header Section – Title – Prologue – Links – Colorful web page – command lines – Some sample HTML documents. Designing the body section: Heading Printing – Aligning the headings – Horizontal Rule – Paragraph – Tab setting – Images and Pictures – Embedding PNG

UNIT V

30 hours

Ordering and Unordered Lists: Lists – Unordered lists – Heading in a list – Ordered Lists – Nested Lists. Table Handling: Tables – table creation in HTML – Width of the table and cells – cells spanning multiple rows/columns – Coloring cells – Column specification – Some Sample tables

Text Book:

C. Xavier, World Wide Web design with HTML, Tata McGraw Hill (2008).

Books for Reference:

1. Jennifer Niedest Robbins, Learning Web Design, O' RELLY Media Publication (2007).
2. Design your Imagination-Free web design book, e-book, Webguru India (2010).

**CORE II
MATLAB (Theory)**

Course Code : 14MADM2
Hours/Week: 10
Credit : 10

Max. Marks : 100
Internal Marks: 40
External Marks: 60

Objective:

To develop the knowledge to solve Mathematical problems using MATLAB.

UNIT I **30 hours**
Introduction - MATLAB - Symbolic calculation - MATLAB Run on the Computer – Getting MATLAB
- Basis of MATLAB: MATLAB Window – On-line – Input-output, File types.

UNIT II **30 hours**
Tutorial Lessons: A minimum MATLAB session – Creating and working with arrays of number –
Creating and printing simple plots – Creating, saving and executing a script file

UNIT III **30 hours**
Matrices and vectors – Matrix and array operation – Special note on array operation –
Command line function.

UNIT IV **30 hours**
Applications: Linear Algebra – Curve fitting interpolation – Data analysis and statistics

UNIT V **30 hours**
Numerical Integration – Ordinary differential equation – Non-linear algebraic equations.

Text Book:

Radra Pratap “Getting Started with MATLAB 7, A Quick introduction for Scientist and Engineers”, Oxford University Press (2006).

Books for Reference:

1. Krister Ahlersten, An Introduction to MATLAB, BookBoon (2012).
2. MATLAB Programming, Wikibooks – ebook (2012).

**CORE III
MATLAB (Practical)**

Course Code: 14MADM3:P
Hours/Week: 10
Credit : 10

Max. Marks : 100
Internal Marks: 40
External Marks: 60

Objective:

To develop the practical skills to solve Mathematical problems using MATLAB.

List of Practical

1. To solve a system of linear equations using MATLAB.
2. To determine the addition, subtraction and multiplication of two matrices of order 4×4 and more orders.
3. To determine the determinant, transpose, inverse of a matrix of order more than 3×3 .
4. To determine the inverse, eigen values and eigen vectors of a matrix of higher order.
5. To fit a straight line, parabola, exponential fit for a given data.
6. To evaluate the given differentiation of order more than 2.
7. To evaluate single and multiple integrals with a given limit.
8. To solve the ordinary differential equation of order 2 and more.

Text Book:

Rudra Pratap, Getting Started with MATLAB, A Quick Introduction for Scientists and Engineers, Oxford University Press (2006).

ADVANCED DIPLOMA PROGRAMME IN E-MATHEMATICAL TOOLS

CORE I STATISTICS

Course Code : 14MAAD1

Hours/Week: 10

Credit : 10

Max. Marks : 100

Internal Marks: 40

External Marks: 60

Objective:

To develop the knowledge to solve Statistical problems.

UNIT I

30hours

Classical definition of probability- Axiomatic Approach to probability – Addition theorem – Conditional probability – Multiplication theorem.

UNIT II

30hours

Measures of Averages – Mean, Median, Mode, Geometric Mean and Harmonic Mean – Merits and de-merits .

UNIT III

30hours

Measures of dispersion – Range Quartile Deviation, Mean Deviation and Standard deviation – Relative Measures – Merits and Demerits.

UNIT IV

30hours

Correlation – Rank Correlation – Properties of correlation coefficient – Regression Analysis – Properties of Regression coefficient (Numerical problems only)

UNIT V

30hours

Curve Fitting – Principle of Least squares – Fitting a straight line – Fitting a second degree polynomial – Fitting a curve of the form ae^{bx} , ab^x and ax^b .

Text Book:

S. C. Gupta and V. K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand and Sons, Third Edition (2010).

Books for Reference:

1. S.C. GUPTA & V.K. KAPOOR, Elements of Mathematical Statistics, Sultan Chand publication, Third Edition (2006).
2. P.R. VITTAL, Mathematical Statistics, Margham Publications, Chennai (2004).

**CORE II
SPSS PACKAGE**

Course Code : 14MAAD2
Hours/Week: 10
Credit : 10

Max. Marks : 100
Internal Marks : 40
External Marks : 60

Objective:

To develop the knowledge to solve Statistical problems using SPSS.

UNIT I **30 hours**
 SPSS Data Files: Opening a data file in SPSS – SPSS data editor – Statistical Analysis – Editing and Manipulating data – Missing values – Editing SPSS output – Copying SPSS output.

UNIT II **30 hours**
 Descriptive statistics with SPSS: Descriptive statistics – Measures of Central tendency – Measures of Dispersion – Descriptive statistics with SPSS (Quantitative data).

UNIT III **30 hours**
 Charts and Graphs: Bar charts – Pie charts – Scatter plots and Dot plots – Line graphs - Histogram.

UNIT IV **30 hours**
 Comparing averages: Parametric test and Non-parametric test to compare averages – Students t-test (two-sample test, one sample t-test)
 Analysis of variance (ANOVA): Analysis of Variance-one factor between subjects (one way ANOVA, two way ANOVA)

UNIT V **30 hours**
 Correlation: Statistical association between variables – Correlation-simple and multiple – Bivariate analysis with SPSS – Rank correlation.
 Regression: Simple linear regression and Multiple regression analysis.

Text Book:

A. Rajathi, P. Chandran, 'SPSS for you', MJP publishers, Chennai, (2010).

Books for Reference:

1. A. S. Gaur & S.S. Gaur, Statistical methods for practice and Research.
2. R.A. Fisher Oliver and Boyd, The Design of Experiments.

CORE III
STATISTICS PRACTICALS USING SPSS PACKAGE

Course Code : 14MAAD3:P
Hours/Week: 10
Credit : 10

Max. Marks : 100
Internal Marks: 40
External Marks: 60

Objective:

To develop the practical skills to solve Statistical problems using SPSS.

List of Practical

1. Calculation of Mean, Standard deviations and Variances.
2. Bar diagram, Line diagram, Pie chart and Histogram.
3. Application of t-test for two sample problems.
4. Application of t-test for paired samples.
5. Application of t-test for testing the significance of Correlation coefficients.
6. Application of t-test in case of dependent samples.
7. One-tailed and two-tailed tests.
8. Application analysis of variance.
9. Calculating simple correlation, multiple correlation and Rank correlation,
10. Simple regression and multiple regression analysis.

Text Book:

A. Rajathi, P. Chandren, SPSS for you, MJP Publications, Chennai (2010).