

# BACHELOR OF TECHNOLOGY

## CSE (AI&ML)

### COURSE STRUCTURE & SYLLABUS

(Batches admitted from the Academic Year 2020 -2021)



### **MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**

**(Autonomous Institution-UGC, Govt. of India)**

Accredited by NBA & NAAC with 'A' Grade, UGC, Govt. of India

NIRF Indian Ranking-2020, Accepted by MHRD, Govt. of India

Band Excellent- National Ranking by ARIIA, MHRD, Govt. of India

Affiliated to JNTUH, Approved by AICTE, ISO 9001:2015 Certified Institution, 2<sup>nd</sup> Rank CSR,

AAAA+ Rated by Digital Learning Magazine, AAA+ Rated by Careers 360 Magazine

Platinum Rated by AICTE-CII Survey, National Ranking-Top 100 Rank band by Outlook,

National Ranking-Top 100 Rank band by Times News Magazine,

141 Natinal Ranking by India Today Magazing

Maisammaguda, Dhullapally, Secunderabad, Kompally-500100

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### COURSE STRUCTURE

#### I Year B. Tech – I Semester (I Semester)

S. No	Subject Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	2000BS01	Mathematics – I	3	1	0	4	30	70
2	2000BS05	Applied Physics	3	1	0	4	30	70
3	2005ES01	Programming for Problem Solving	3	1	0	4	30	70
4	2003ES01	Engineering Drawing	1	0	4	3	30	70
5	2000BS61	Applied Physics Lab	0	0	3	1.5	30	70
6	2005ES61	Programming for Problem Solving Lab	-	0	3	1.5	30	70
7	2000MC01	Environmental Science*	3	0	0	0	100	0
		Induction Programme						
		<b>TOTAL</b>	<b>13</b>	<b>3</b>	<b>10</b>	<b>18</b>	<b>280</b>	<b>420</b>

#### I Year B. Tech – II Semester (II Semester)

S. No	Subject Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	2000BS02	Mathematics – II	3	1	0	4	30	70
2	2005ES02	Python Programming	3	1	0	4	30	70
3	2000HS01	English	2	0	0	2	30	70
4	2002ES01	Basic Electrical Engineering	3	0	0	3	30	70
5	2003ES61	Engineering Workshop	1	0	3	2.5	30	70
6	2002ES61	Basic Electrical Engineering Lab	0	0	2	1	30	70
7	2005ES62	Python Programming Lab	0	0	3	1.5	30	70
8	2000HS61	English Language & Communication Skills Lab	0	0	2	1	30	70
9	2000MC02	French Language*	2	0	0	0	100	0
		<b>TOTAL</b>	<b>12</b>	<b>2</b>	<b>10</b>	<b>19</b>	<b>340</b>	<b>560</b>

\*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree

## II Year B. Tech – I Semester (III Semester)

*\*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree*

S. No	Subject Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	2000BS04	Probability & Statistics	3	1	0	4	30	70
2	2004ES01	Analog and Digital Electronic Circuit	3	0	0	3	30	70
3	2005PC01	Data Structures & Algorithms	3	0	0	3	30	70
4	2005PC03	Discrete Mathematics	3	0	0	3	30	70
5	2005PC04	Object Oriented Programming through Java	3	0	0	3	30	70
6	2005PC61	Data Structures & Algorithms Lab	0	0	3	1.5	30	70
7	2005PC63	Object Oriented Programming through Java Lab	0	0	3	1.5	30	70
8	2000MC03`	Human values and Professional Ethics	2	0	0	0	100	0
<b>TOTAL</b>			<b>17</b>	<b>1</b>	<b>6</b>	<b>19</b>	<b>310</b>	<b>490</b>

## II Year B. Tech – II Semester (IVSemester)

S. No	Subject Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	2000HS03	Managerial Economics and Financial Analysis	3	0	0	3	30	70
2	2005ES03	Computer Organization & Operating System	3	0	0	3	30	70
3	2005PC07	Formal Languages and Automata Theory	3	0	0	3	30	70
4	2066PC01	Artificial Intelligence	3	0	0	3	30	70
5	2005PC10	Design and Analysis of Algorithms	3	0	0	3	30	70
6	2005PC08	Database Management Systems	3	0	0	3	30	70
7	2066PC61	Artificial Intelligence LAB	0	0	3	1.5	30	70
8	2005PC64	Database Management Systems Lab	0	0	3	1.5	30	70
9	2000MC04	Indian Constitution *	2	0	0	0	100	0
<b>TOTAL</b>			<b>20</b>	<b>0</b>	<b>6</b>	<b>21</b>	<b>340</b>	<b>560</b>

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### III Year B. Tech – I Semester (V Semester)

S. No	Subject Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	2012PC01	Data Warehouse & Data Mining	3	0	0	3	30	70
2	2005PC09	Compiler Design	3	0	0	3	30	70
3	2005PC05	Software Engineering	3	0	0	3	30	70
4	2005PC11	Computer Networks	3	0	0	3	30	70
5		Professional Elective-1	3	0	0	3	30	70
6		Open Elective-I	3	0	0	3	30	70
7	2012PC61	DWDM Lab	0	0	3	1.5	30	70
8	2005PC66	Computer Networks Lab	0	0	3	1.5	30	70
9	2000MC05	Technical Communications and Soft Skills*	2	0	0	0	100	0
<b>TOTAL</b>			<b>20</b>	<b>0</b>	<b>6</b>	<b>21</b>	<b>340</b>	<b>560</b>

*\*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree*

### III Year B. Tech – II Semester (VI Semester)

S. No	Subject Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	2066PC02	Neural Networks	3	0	0	3	30	70
2	2005PC12	Machine Learning	3	0	0	3	30	70
3	2012PC02	Web Technologies	3	0	0	3	30	70
4		Professional Elective - 2	3	0	0	3	30	70
5		Professional Elective-3	3	0	0	3	30	70
6		Open Elective - 2	3	0	0	3	30	70
7	2005PC67	Machine Learning Lab	0	0	3	1.5	30	70
8	2012PC62	Web Technologies Lab	0	0	3	1.5	30	70
9	2000MC06	Indian Tradition Knowledge *	2	0	0	0	100	0
<b>TOTAL</b>			<b>20</b>	<b>0</b>	<b>6</b>	<b>21</b>	<b>340</b>	<b>560</b>

*\*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree Industry Oriented Mini Project/ Internship - During Summer Vacation-Evaluation in IV-I*

### IV Year B. Tech – I Semester (VII Semester)

S. No	Subject Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	2066PC03	Natural Language Processing	3	0	0	3	30	70
2	2066PC04	Deep Learning	3	1	0	4	30	70
3		Professional Elective -4	3	0	0	3	30	70
4		Open Electives-3	3	0	0	3	30	70
5	2066PC63	Deep Learning Lab	0	0	3	1.5	30	70
6	2066PC62	Natural Language Processing Lab	0	0	3	1.5	30	70
7	2066PR01	Industry Oriented Mini Project / Internship	0	0	0	2	30	70
8	2066PR02	Project-I	0	0	8	4	30	70
		<b>TOTAL</b>	<b>12</b>	<b>0</b>	<b>14</b>	<b>22</b>	<b>340</b>	<b>560</b>

\*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree

\*Summer between III & IV Year: Mini Project

### IV Year B. Tech – II Semester (VIII Semester)

S. No	Subject Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1		Professional Elective-V	3	0	0	3	30	70
2		Professional Elective-VI	3	0	0	3	30	70
3		Open Elective -4	3	0	0	3	30	70
4	2066PR03	Technical Seminar	0	0	0	2	100	0
5	2066PR05	Project-II	0	0	12	6	30	70
6	2066PR04	Innovation Startup & Entrepreneurship	0	0	4	2	30	70
		<b>TOTAL</b>	<b>9</b>	<b>0</b>	<b>16</b>	<b>19</b>	<b>220</b>	<b>280</b>

Semester	I-I	I-II	II-I	II-II	III-I	III-II	IV-I	IV-II	TOTAL
<b>Credits</b>	18	19	19	21	21	21	22	19	160

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### PROFESSIONAL ELECTIVES

PROFESSIONAL ELECTIVES					
Professional Elective -I		Professional Elective -II		Professional Elective -III	
2005PE13	Image Processing	2005PE07	Computer Vision	2005PE17	AI Search Method for Problem Solving
2012PE01	Foundations of Data Science	2005PE15	Text Analytics	2012PE03	Web Mining
2005PE04	Mobile Computing	2005PE16	Software Testing Methodologies	2005PE18	Cyber Security
Professional Elective -IV		Professional Elective -V		Professional Elective -VI	
2005PE19	Cognitive Computing	2005PE05	Pattern Recognition	2005PE21	Game Programming
2012PE04	Business Analytics	2012PE05	Big Data Analytics	2012PE06	Distributed Trust and Block Chain Technology
2005PE08	Cloud Computing	2005PE20	Distributed Systems	2005PE12	Internet of Things

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2000BS01) MATHEMATICS - I

B.Tech. I Year I Sem

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### COURSE OBJECTIVES:

#### To learn

- Types of Matrices and their properties, concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations.
- Concept of Eigen values and Eigenvectors and to reduce the quadratic form to canonical form.
- Geometrical approach to the mean value theorems, their application to the mathematical problems and Evaluation of improper integrals using Beta and Gamma functions
- Partial differentiation, concept of total derivative, finding maxima and minima of function of two and three variables.
- Evaluation of multiple integrals and their applications.

### Course Outcomes:

After learning the contents of this paper, the student must be able to

- Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations
- Find the Eigen values and Eigen vectors and reduce the quadratic form to canonical form using orthogonal transformations.
- Solve the applications on mean value theorems and evaluate the improper integrals using Beta and Gamma functions
- Find the extreme values of functions of two variables with/ without constraints.
- Evaluate the multiple integrals and apply the concept to find areas, volumes.

### UNIT-I:

**Matrices:** Types of Matrices, Symmetric; Skew-symmetric; Hermitian; Skew-Hermitian; Orthogonal matrices; Unitary Matrices; Rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method; System of linear equations; Solving system of Homogeneous and Non-Homogeneous equations. Gauss elimination method; Gauss Seidel Iteration Method.

### UNIT-II:

**Eigen values and Eigen vectors:** Eigen values and Eigenvectors and their properties; Diagonalization of a matrix; Cayley-Hamilton Theorem (without proof); Finding inverse and power of a matrix by Cayley-Hamilton Theorem; Linear Transformation and Orthogonal Transformation; Quadratic forms and Nature of the Quadratic

Forms; Reduction of Quadratic form to Canonical form by Orthogonal Transformation.

### UNIT-III:

**Differential Calculus:** Rolle's mean value theorem (without proof), Lagrange's Mean value theorem (without proof) with their Geometrical Interpretation, Cauchy's Mean value Theorem (without proof). Taylor's series, Maclaurin's series. Definition of Improper Integral; Definition of Beta and Gamma functions, properties, relation between them and evaluation of integrals using Beta and Gamma functions.

### UNIT-IV:

**Multivariable Calculus:** Definitions of Limit and Continuity. Partial Differentiation; Euler's Theorem; Total derivative; Jacobian; Functional dependence & independence, Maxima and minima of functions of two variables and three variables using method of Lagrange multipliers.

### UNIT-V:

**Multiple Integrals:** Evaluation of Double Integrals (Cartesian and Polar coordinates); Change of order of integration (only Cartesian form); Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double and (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals. Areas (by double integrals) and Volumes (by double integrals and triple integrals).

### TEXTBOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2. R. K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publishers, 4th Edition, 2014.

### REFERENCES:

1. Michael Greenberg, Advanced Engineering Mathematics, Pearson Education, 2nd Edition, 1998.
2. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons, 9th Edition, 2006.
3. Ramana B. V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2017.



# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2000BS05) APPLIED PHYSICS

B.Tech. I Year I Sem

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### COURSE OBJECTIVES

- Students will demonstrate skills in scientific inquiry, problem solving and laboratory techniques.
- Students will be able to demonstrate competency and understanding of the concepts found in Quantum Mechanics, Fiber optics and lasers, Semiconductor physics.
- The graduates will be able to solve non-traditional problems that potentially draw on knowledge in multiple areas of physics.
- To study applications in engineering like memory devices, transformer core and electromagnetic machinery.

### Course Outcomes: Upon graduation:

- The student would be able to learn the fundamental concepts on Quantum behaviour of matter in its micro state.
- The knowledge of fundamentals of Semiconductor physics, Electronic devices, Lasers and fibre optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.
- Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
- The course also helps the students to have exposure on dielectric materials and magnetic materials.

### UNIT-I

#### Quantum Mechanics

Introduction to quantum physics, Black body radiation, Photoelectric effect, Compton effect experiment and Compton shift, de-Broglie's hypothesis, Wave-particle duality, Davisson and Germer experiment, Heisenberg's Uncertainty principle, Wave function and its physical significance, Schrodinger's time independent wave equation, Particle in one dimensional box.

### UNIT-II

#### Semiconductor Physics

Intrinsic and Extrinsic semiconductors, Fermi level in intrinsic and extrinsic semiconductors, calculation of carrier concentration in intrinsic and extrinsic semiconductors, Carrier generation and recombination, Carrier transport: diffusion and drift, Hall effect: determination of Hall coefficient and experiment, Hall voltage, direct and indirect band gap semiconductors, p-n junction diode: energy band diagram for open and closed circuits, Zener diode and its V-I Characteristics and applications.

### UNIT-III

#### Optoelectronics

Radiative and non-radiative recombination mechanisms in semiconductors, LED and Device structure, Materials, Characteristics and figures of merit, Semiconductor photo detectors: Solar cell, PIN and Avalanche and their structure, Materials, working principle and Characteristics and applications.

#### UNIT-IV

##### **Lasers and Fiber Optics**

**Lasers:** Characteristics of Lasers, interaction of radiation with matter: stimulated absorption, spontaneous and stimulated emission, Einstein's relations, Principle and working of Laser: Population inversion, Pumping mechanisms, Types of Lasers: Ruby laser, He-Ne laser, Semiconductor lasers, Applications of laser. Fiber Optics: Introduction Optical fiber, Optical fiber as a dielectric wave guide, Total internal reflection, Acceptance angle, Acceptance cone and Numerical aperture, mode and transmission of signal through Step and Graded index fibers, Losses associated with optical fibers, Applications of optical fibers in communication system (block diagram) and in other fields.

#### UNIT-V

##### **Dielectric and Magnetic Properties of Materials**

Electric dipole, dipole moment, dielectric constant, polarizability, electric displacement, electric susceptibility, types of polarization: electronic, ionic and orientation (qualitative) polarizations, calculation of polarizabilities of electronic and ionic polarization, Internal fields in a solid, Clausius-Mossotti equation, Ferroelectrics, Piezo electric and Pyro electric, Applications of dielectrics, Magnetization, field intensity, magnetic field induction, permeability and susceptibility, Bohr magneton, Classification of magnetic materials on the basis of magnetic moment, hysteresis curve based on domain theory, soft and hard magnetic materials, applications of magnetic materials.

#### **TEXT BOOKS:**

1. Engineering Physics, B.K. Pandey, S. Chaturvedi - Cengage Learning.
2. Halliday and Resnick, Physics - Wiley.
3. A textbook of Engineering Physics, Dr. M. N. Avadhanulu, Dr. P.G. Kshirsagar - S.Chand

#### **REFERENCES:**

1. Richard Robinett, Quantum Mechanics
2. J. Singh, Semiconductor Optoelectronics: Physics and Technology, Mc Graw-Hill inc.(1995).
3. Online Course: "Optoelectronic Materials and Devices" by Monica Katiyar and Deepak Guptha on NPTEL
4. "Semiconductor Physics And Devices", Mc Graw Hill, 4th Edition by Donald Neamen
5. Introduction to Solid State Physics by Charles Kittel, Wiley student edition.
6. S.M. Sze, Semiconductor Devices: Physics and Technology, Wiley (2008)

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2003ES01) ENGINEERING DRAWING

B.Tech. I Year I Sem

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### COURSE OBJECTIVES:

1. To enable the students with various concepts like Dimension, Conventions and standards related to working drawing in order to become professionally efficient and to introduce fundamental concepts of curves used in engineering,
2. Students are capable to understand the Orthographic Projections of Points and Lines and are able to improve their visualization skills so that they can apply these skills in developing the new products.
3. Understands and becomes efficient in applying the concept of Orthographic Projections of Points, Lines and Planes in industrial applications
4. Can employ freehand 3D pictorial sketching to aid in the visualization process and to efficiently communicate ideas graphically.
5. Analyze a drawing and can efficiently communicate ideas graphically and Draw the 3D views using CAD.

### Course Outcomes:

1. Gets knowledge on usage of various drawing instruments and capable to draw various curves like conic curves, cycloidal curves and involutes.
2. Understand the Orthographic Projections of Points and Lines and are able to improve their visualization skills so that they can apply these skills in developing the new products.
3. Understand about orthographic projection and able to draw planes and solids according to orthographic projections.
4. Can employ freehand 3D pictorial sketching to aid in the visualization process and to draw the 3D views using CAD software.
5. To convert and draw the given orthographic view to isometric view using CAD software and vice versa.

### Introduction to Auto CAD Software:

The Menu System, Toolbar (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Cross hairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line, The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.

### UNIT-I:

#### Introduction to Engineering Drawing:

Principles of Engineering drawing and their significance, Conventions, Drawing Instruments

**Engineering Curves:** Construction of Ellipse, Parabola and Hyperbola - General and Special methods; Cycloidal curves- Epicycloids and Hypocycloids.

**UNIT-II:**

**Orthographic Projections, Projections of Points & Straight Lines:** Principles of Orthographic Projections - Conventions; Projections of Points in all positions; Projections of lines Parallel to one Plane and Perpendicular to other Plane and Vice-versa - Inclined to one Plane and Parallel to other Plane and Vice-versa - Surface Inclined to both the Planes.

**UNIT-III:**

**Projections of Planes:** Projections of Planes- Surface Parallel to one Plane and Perpendicular to other Plane and Vice-versa - Surface Inclined to one Plane and Parallel to other Plane and Vice-versa - Surface Inclined to both the Planes.

**UNIT-IV:**

**Projections of Regular Solids:** Projections of Regular Solids-Parallel to one Plane and Perpendicular to other Plane and Vice-versa- Inclined to one Plane and Parallel to other Plane and Vice-versa- Inclined to both the Planes- Prisms, Pyramids, Cylinder and Cone.

**UNIT-V:**

**Isometric Projections:** Principles of Isometric projection - Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and Compound Solids

Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions

**Introduction to Solid Modeling:** Creation of simple solid models relevant to the domain.

**TEXT BOOKS**

1. Engineering Drawing, N.D. Bhatt - N.D. Bhatt & V.M Panchal, 48th Edition, 2005 Charotar Publishing House, Gujarat.
2. "Computer Aided Engineering Drawing" by Dr. M H Annaiah, Dr C N Chandrappa and Dr B Sudheer Premkumar Fifth edition, New Age International Publishers.

**REFERENCES**

1. Engineering Drawing / Basant Agarwal and McAgarwal / McGraw Hill
2. Computer Aided Engineering Drawing - S. Trymbaka Murthy, - I.K. International Publishing House Pvt. Ltd., New Delhi, 3rd revised edition-2006.

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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2000BS61) APPLIED PHYSICS LAB

B.Tech. I Year I Sem

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### LIST OF EXPERIMENTS:

Note: Any 8 Experiments to be performed

**1. Energy gap of a PN junction diode**

To determine the energy band gap of a semiconductor p-n junction diode

**2. Solar Cell**

Characteristics of a given Solar Cell

**3. Light Emitting Diode**

To study the VI characteristics of a Light Emitting Diode

**4. Stewart and Gee's Experiment**

To determine the magnetic induction at the center and at several points on the axis of a circular coil

**5. HALL Effect Experiment**

Determination of hall coefficient and Hall voltage

To calculate the Hall coefficient and the carrier concentration of the sample material.

**6. Photoelectric Effect**

To determine the work function of a given material.

**7. LASER**

To study the characteristics of LASER diode Sources.

**8. A) Optical Fiber Numerical Aperture**

To determine the numerical Aperture (NA) of the given optical fiber

**B) Optical Fiber Bending Loss**

To determine the loss caused in optical fibers in dB due to macro bending of the fiber

**9. A) LCR series Circuit**

To study the frequency response of LCR series circuits and to determine the Resonant Frequency.

**B) LCR Parallel Circuit**

To study the frequency response of LCR parallel circuits and to determine the Resonant Frequency.

**10. R-C Circuit**

To determine the time constant of the given RC circuit

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2005ES61) PROGRAMMING FOR PROBLEM SOLVING LAB

B.Tech. I Year I Sem

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### COURSE OBJECTIVES:

The students will learn the following:

- To work with an IDE to create, edit, compile, run and debug programs
- To analyze the various steps in program development.
- To develop programs to solve basic problems by understanding basic concepts in C like operators, control statements etc.
- To develop modular, reusable and readable C Programs using the concepts like functions, arrays etc.
- To write programs using the Dynamic Memory Allocation concept.
- To create, read from and write to text and binary files

**Course Outcomes:** The candidate is expected to be able to:

- formulate the algorithms for simple problems
- translate given algorithms to a working and correct program
- correct syntax errors as reported by the compilers
- identify and correct logical errors encountered during execution
- represent and manipulate data with arrays, strings and structures
- use pointers of different types
- create, read and write to and from simple text and binary files
- modularize the code with functions so that they can be reused

### Practice sessions:

1. Write a simple program that prints the results of all the operators available in C (including pre/post increment, bitwise and/or/not, etc.). Read required operand values from standard input.
2. Write a simple program that converts one given data type to another using auto conversion and casting. Take the values from standard input.

### Simple numeric problems

- a) Write a program to find the max and min from the three numbers.
- b) Write the program for the simple, compound interest.
- c) Write a program that declares a class awarded for a given percentage of marks, where mark <40% = Failed, 40% to <60%

= Second class, 60% to <70%=First class, >= 70% = Distinction. Read percentage from standard input.

- d) Write a program that prints a multiplication table for a given number and the number of rows in the table. For example, for a number 5 and rows = 3, the output should be:  $5 \times 1 = 5$

$$5 \times 2 = 10$$

$$5 \times 3 = 15$$

- e) Write a program that shows the binary equivalent of a given positive number between 0 to 255.

### Expression Evaluation:

- i) A building has 10 floors with a floor height of 3 meters each. A ball is dropped from the top of the building. Find the time taken by the ball to reach each floor. (Use the formula  $s = ut + \frac{1}{2}at^2$  where  $u$  and  $a$  are the initial velocity in m/sec ( $= 0$ ) and acceleration in  $m/sec^2$  ( $= 9.8m/s^2$ )).
- ii) Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators  $+, -, *, /, \%$  and use Switch Statement)
- iii) Write a program that finds if a given number is a prime number
- iv) Write a C program to find the sum of individual digits of a positive integer and test given number is palindrome.
- v) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first  $n$  terms of this sequence.
- vi) Write a C program to generate all the prime numbers between 1 and  $n$ , where  $n$  is a value supplied by the user.
- vii) Write a C program to find the roots of a Quadratic equation.
- viii) Write a C program to calculate the following, where  $x$  is a fractional value.  $1 - x/2 + x^2/4 - x^3/6$
- ix) Write a C program to read two numbers,  $x$  and  $n$ , and then compute the sum of this geometric progression:  $1 + x + x^2 + x^3 + \dots + x^n$ . For example: if  $n$  is 3 and  $x$  is 5, then the program computes  $1 + 5 + 25 + 125$ .

### Arrays and Pointers and Functions:

- a) Write a C program to find the minimum, maximum and average in an array of integers.
- b) Write a function to compute mean, variance, Standard Deviation, sorting of  $n$  elements in single dimension array.
- c) Write a C program that uses functions to perform the following:
  - i. Addition of Two Matrices
  - ii. Multiplication of Two Matrices
  - iii. Transpose of a matrix with memory dynamically allocated for the new matrix as row and column counts may not be same.
- d) Write C programs that use both recursive and non-recursive functions
 

To find the factorial of a given integer. To find the GCD (greatest common divisor) of two given integers.

  - i) To find  $x^n$
- e) Write a program for reading elements using pointer into array and display the values using array.
- f) Write a program for display values reverse order from array using pointer.

- g) Write a program through pointer variable to sum of n elements from array.

### Strings

- a) Write a C program to convert a Roman numeral ranging from I to L to its decimal equivalent.
- b) Write a C program that converts a number ranging from 1 to 50 to Roman equivalent
- c) Write a C program that uses functions to perform the following operations:
- To insert a sub-string in to a given main string from a given position.
  - To delete n Characters from a given position in a given string.
- d) Write a C program to determine if the given string is a palindrome or not (Spelled same in both directions with or without a meaning like madam, civic, noon, abcba, etc.)
- e) Write a C program that displays the position of a character ch in the string S or - 1 if S doesn't contain ch.
- f) Write a C program to count the lines, words and characters in a given text.

### Structures & Unions:

- a) Write a C program that uses functions to perform the following operations using Structure
- Reading a complex number
  - Writing Complex Number
  - Addition of 2 Complex Numbers
  - Multiplication of two complex numbers
- b) Write a C program to store information of 5 students using structures.
- c) Write a C program to Access all structures members using pointer structure variable.
- d) Write a C program to access members of union?

### Files

- a) Write a C program to display the contents of a file to standard output device.
- b) Write a C program which copies one file to another, replacing all lowercase characters with their uppercase equivalents.
- c) Write a C program to count the number of times a character occurs in a text file. The file name and the character are supplied as command line arguments.
- d) Write a C program that does the following:
- e) It should first create a binary file and store 10 integers, where the file name and 10 values are given in the command line. (hint: convert the strings using atoi function) Now the program asks for an index and a value from the user and the value at that index should be changed to the new value in the file. (hint: use fseek function). The program should then read all 10 values and print them back.
- f) Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file).

### Miscellaneous:



a. Write a menu driven C program that allows a user to enter n numbers and then choose between finding the smallest, largest, sum, or average. The menu and all the choices are to be functions. Use a switch statement to determine what action to take. Display an error message if an invalid choice is entered.

b. Write a C Program to construct a pyramid of numbers as follows:1

```

*           1           1
* *        2 3         2 2
* * *      4 5 6       3 3 3
                                   4 4 4 4

```

c. Write a C Program implement Student Data Base System Using Files&Structures.

### Sorting and Searching:

a. Write a C program that uses non recursive function to search for a Key value in a given list of integers using linear searchmethod.

b. Write a C program that uses non recursive function to search for a Key value in a given sorted list of integers using binary searchmethod.

c. Write a C program that implements the Bubble sort method to sort a given list of integers in ascendingorder.

d. Write a C program that sorts the given array of integers using selection sort in descending order

e. Write a C program that sorts the given array of integers using insertion sort in ascending order

f. Write a C program that sorts a given array ofnames

### Suggested Reference Books for solving the problems:

i. Byron Gottfried, Schaum's Outline of Programming withC,McGraw-Hill

ii. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition)

iii. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language,PrenticeHall of India

iv. R.G. Dromey, How to solve it by Computer, Pearson(16thImpression)

v. Programming in C, Stephen G. Kochan, Fourth Edition,PearsonEducation.

vi. Herbert Schildt, C: The Complete Reference, Mc Graw Hill,4thEdit

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2000MC01) ENVIRONMENTAL SCIENCE

B.Tech. I Year I Sem      L T P C  
3 0 0 0

### COURSE OBJECTIVES:

- Understanding the importance of ecological balance for sustainable development.
- Understanding the impacts of developmental activities and mitigation measures.
- Understanding the environmental policies and regulations

### Course Outcomes

Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development.

### UNIT-I

**Ecosystems:** Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnifications, ecosystem value, services and carrying capacity, Field visits.

### UNIT-II

**Natural Resources:** Classification of Resources: Living and Non-Living resources, water resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, Land resources: Forest resources, Energy resources: growing energy needs, renewable and non renewable energy sources, use of alternate energy source, case studies.

### UNIT-III

**Biodiversity And Biotic Resources:** Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act.

### UNIT-IV

**Environmental Pollution and Control Technologies:** Environmental Pollution: Classification of pollution, Air Pollution: Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. Water pollution: Sources and types of pollution, drinking water quality s

**Tandards. Soil Pollution:** Sources and types, Impacts of modern agriculture, degradation of soil. Noise Pollution: Sources and Health hazards, standards, Solid waste: Municipal Solid Waste management, composition and characteristics of e-Waste and its management. Pollution control technologies: Wastewater Treatment methods: Primary, secondary and Tertiary. Overview of air pollution control technologies, Concepts of bioremediation. Global Environmental Issues and Global Efforts: Climate change and impacts on human environment. Ozone

depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol, and Montréal Protocol. NAPCC- GoI initiatives.

#### UNIT-V

**Environmental Policy, Legislation & EIA:** Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP). Towards Sustainable

**Future:** Concept of Sustainable Development Goals, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health, Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon lifestyle.

#### TEXT BOOKS:

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
2. Environmental Studies by R. Rajagopalan, Oxford University Press.

#### REFERENCE BOOKS:

1. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHI Learning Pvt. Ltd.
3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley India edition.
4. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
5. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.
6. Introduction to Environmental Science by Y. Anjaneyulu, BS Publications.

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2000BS02) MATHEMATICS - II

B.Tech. I Year II Sem      L T P C

3 1 0 4

### COURSE OBJECTIVES:

- To learn Methods of solving the differential equations of first and higher order
- Evaluation of multiple integrals and their applications
- The physical quantities involved in engineering field related to vector valued functions
- The basic properties of vector valued functions and their applications to line, surface and volume integrals

Course Outcomes: After learning the contents of this paper the student must be able to:

- Identify whether the given differential equation of first order is exact or not
- Solve higher differential equation and apply the concept of differential equation to real world problems
- Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelepiped
- Evaluate the line, surface and volume integrals and converting them from one to another

### UNIT-I:

**First Order ODE** Exact, linear and Bernoulli's equations; Applications: Newton's law of cooling, Law of natural growth and decay; Equations not of first degree: equations solvable for  $p$ , equations solvable for  $y$ , equations solvable for  $x$  and Clairaut's type.

### UNIT-II:

**Ordinary Differential Equations of Higher Order** Second order linear differential equations with constant coefficients: Non-Homogeneous terms of the type  $e^{ax}$ ,  $\sin ax$ ,  $\cos ax$ , polynomials in  $x$ ,  $e^{ax}V(x)$  and  $x V(x)$ , method of variation of parameters. Equations reducible to linear ODE with constant coefficients: Legendre's equation, Cauchy-Euler equation.

### UNIT-III:

**Multivariable Calculus (Integration):** Evaluation of Double Integrals (Cartesian and polar coordinates); change of order of integration (only Cartesian form); Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double and (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals.

Applications: Areas (by double integrals) and volumes (by double integrals and triple integrals), Centre of mass and Gravity (constant and variable densities) by double and triple integrals (applications involving cubes, sphere and rectangular parallelepiped).

### UNIT-IV:

**Vector Differentiation:** Vector point functions and scalar point functions. Gradient, Divergence and Curl.

Directional derivatives, Tangent plane and normal line. Vector Identities. Scalar potential functions. Solenoidal and Irrotational vectors.

**UNIT-V:**

**Vector Integration:** Line, Surface and Volume Integrals. Theorems of Green, Gauss and Stokes (without proofs) and their applications.

**TEXT BOOKS:**

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006
3. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.

**REFERENCES:**

1. Paras Ram, Engineering Mathematics, 2nd Edition, CBS Publishes **S. L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.**

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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2005ES02) PYTHON PROGRAMMING

B.Tech. I Year II Sem      L T P C  
3 1 0 4

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### COURSE OBJECTIVES:

- This course will enable students to
- Learn Syntax and Semantics and create Functions inPython.
- Handle Strings and Files inPython.
- Understand Lists, Dictionaries and Regular expressions inPython.
- Implement Object Oriented Programming concepts inPython.
- Build GUI Programming inPython.

### Course Outcomes:

The students should be able to

- Examine Python syntax and semantics and be fluent in the use of Python flow control andfunctions.
- Demonstrate proficiency in handling Strings and FileSystems.
- Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use RegularExpressions.
- Interpret the concepts of Object-Oriented Programming as used inPython.
- Implement exemplary applications related to Graphical User Interface (GUI) in Python.

### UNIT I

PYTHON Programming Introduction, History of Python, Python is Derived from?, Python Features, Python Applications, Why Python is Becoming Popular Now a Day?, Existing Programming Vs Python Programming, Writing Programs in Python, Top Companies Using Python, Python Programming Modes, Interactive Mode Programming, Scripting Mode Programming, Flavors in Python, Python Versions, Download & Install the Python in Windows & Linux, How to set Python Environment in the System?, Anaconda - Data Science Distributor, Downloading and Installing Anaconda, Jupyter Notebook & Spyder, Python IDE - Jupyter Notebook Environment, Python IDE - Spyder Environment, Python Identifiers(Literals), Reserved Keywords, Variables, Comments, Lines and Indentations, Quotations, Assigning Values toVariables

### UNIT II

Data Types in Python, Mutable Vs Immutable, Fundamental Data Types: int, float, complex, bool, str, Number

Data Types: Decimal, Binary, Octal, Hexa Decimal & Number Conversions, Inbuilt Functions in Python, Data Type Conversions, Priorities of Data Types in Python, Python Operators, Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Slicing & Indexing, Forward Direction Slicing with +ve Step, Backward Direction Slicing with -ve Step, Decision Making Statements, if Statement, if-else Statement, elif Statement, Looping Statements, Why we use Loops in python?, Advantages of Loops for Loop, Nested for Loop, Using else Statement with for Loop, while Loop, Infinite while Loop, Using else with Python while Loop, Conditional Statements, break Statement, continue Statement, Pass Statement

### UNIT III

Advanced Data Types: List, Tuple, Set, Frozenset, Dictionary, Range, Bytes & Bytearray, None, List Data Structure, List indexing and splitting Updating List values, List Operations, Iterating a List, Adding Elements to the List, Removing Elements from the List, List Built-in Functions, List Built-in Methods, Tuple Data Structure, Tuple Indexing and Splitting, Tuple Operations, Tuple Inbuilt Functions, Where use Tuple, List Vs Tuple, Nesting List and Tuple, Set Data Structure, Creating a Set, Set Operations, Adding Items to the Set, Removing Items from the Set, Difference Between discard() and remove(), Union of Two Sets, Intersection of Two Sets, Difference of Two Sets, Set Comparisons, Frozenset Data Structure, Dictionary Data Structure, Creating the Dictionary, Accessing the Dictionary Values, Updating Dictionary Values, Deleting Elements Using del Keyword, Iterating Dictionary, Properties of Dictionary Keys, Built-in Dictionary Functions, Built-in Dictionary Methods, List Vs Tuple Vs Set Vs Frozenset Vs Dictionary Range, Bytes, Bytearray & None

### UNIT IV

Python Functions, Advantage of Functions in Python, Creating a Function, Function Calling, Parameters in Function, Call by Reference in Python, Types of Arguments, Required Arguments, Keyword Arguments, Default Arguments, Variable-Length Arguments, Scope of Variables, Python Built-in Functions, Python Lambda Functions, String with Functions, Strings Indexing and Splitting

String Operators, Python Formatting Operator, Built-in String Functions, Python File Handling, Opening a File, Reading the File, Read Lines of the File, Looping through the File, Writing the File, Creating a New File Using with Statement with Files, File Pointer Position, Modifying File Pointer Position

Renaming the File & Removing the File, Writing Python Output to the Files

File Related Methods, Python Exceptions, Common Exceptions, Problem without Handling Exceptions, except Statement with no Exception, Declaring Multiple Exceptions, Finally Block, Raising Exceptions, CustomException,

### UNIT V

Python Packages, Python Libraries, Python Modules, Collection Module, Math Module, OS Module, Random Module, Statistics Module, Sys Module, Date & Time Module, Loading the Module in our Python Code, import Statement, from-import Statement, Renaming a Module, Regular Expressions, Command Line Arguments, Object Oriented Programming (OOPs), Object-oriented vs Procedure-oriented Programming languages, Object, Class, Method, Inheritance, Polymorphism, Data Abstraction, Encapsulation, Python Class and Objects, Creating Classes in Python, Creating an Instance of the Class, Python Constructor, Creating the Constructor in Python, Parameterized Constructor, Non-Parameterized Constructor, In-built Class Functions, In-built Class Attributes, Python Inheritance,

Python Multi-Level Inheritance, Python Multiple Inheritance, Method Overriding, Data Abstraction in Python, Graphical User Interface (GUI) Programming, Python Tkinter, Tkinter Geometry, pack() Method, grid() Method, place() Method, TkinterWidgets

**TEXT BOOK:**

1. Core Python Programming, Wesley J. Chun, Second Edition, Pearson

**REFERENCE BOOK:**

1. Programming Languages, A.B. Tucker, R.E. Noonan, TMH.
2. Programming Languages, K. C. Loudon and K A Lambert., 3rd edition, Cengage Learning.
3. Programming Language Concepts, C Ghezzi and M Jazayeri, Wiley India.
4. Programming Languages 2nd Edition Ravi Sethi Pearson.
5. Introduction to Programming Languages Arvind Kumar Bansal CRC Press.



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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2000HS01) ENGLISH

B.Tech. I Year II Sem      L T P C  
2 0 0 2

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### INTRODUCTION

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire language skills, the syllabus of English has been designed to develop linguistic, communicative and critical thinking competencies of Engineering students.

In English classes, the focus should be on the skills development in the areas of vocabulary, grammar, reading and writing. For this, the teachers should use the prescribed text for detailed study. The students should be encouraged to read the texts leading to reading comprehension and different passages may be given for practice in the class. The time should be utilized for working out the exercises given after each excerpt, and also for supplementing the exercises with authentic materials of a similar kind, for example, newspaper articles, advertisements, promotional material etc. The focus in this syllabus is on skill development, fostering ideas and practice of language skills in various contexts and cultures.

### Course Objectives:

The course will help to

- a. Improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills.
- b. Enhance competencies in writing essays and gist of the passage in words.
- c. Equip students to study academic subjects more effectively and critically, using the theoretical and practical components of English syllabus.
- d. Develop study skills and communication skills in formal and informal situations.

### Course Outcomes:

Students should be able to

1. Use English Language effectively in spoken and written forms.
2. Comprehend the given texts and respond appropriately.
3. Communicate confidently in various contexts and different cultures.
4. Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.

### UNIT -I

'The Raman Effect' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

**Vocabulary Building:** The Concept of Word Formation --The Use of Prefixes and Suffixes. Grammar: Identifying Common Errors in Writing with Reference to Articles and Prepositions. Reading: Reading and its Importance- Techniques for Effective Reading.

**Basic Writing Skills:** Sentence Structures - Use of Phrases and Clauses in Sentences-Importance of Proper Punctuation- Techniques for writing precisely - Paragraph writing - Types, Structures and Features of a Paragraph - Creating Coherence-Organizing Principles of Paragraphs in Documents.

## UNIT -II

'Ancient Architecture in India' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

**Vocabulary:** Homonyms, Homophones and Homographs. Acquaintance with Prefixes and Suffixes from Foreign Languages in English to form Derivatives-Words from Foreign Languages and their Use in English.

**Grammar:** Identifying Common Errors in Writing with Reference to Noun-pronoun Agreement and Subject- verb Agreement.

**Reading:** Improving Comprehension Skills - Techniques for Good Comprehension

**Writing:** Format of a Formal Letter-Writing Formal Letters - E.g., Letter of Complaint, Letter of Requisition, Job Application with Resume.

## UNIT -III

'Blue Jeans' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

**Vocabulary:** Synonyms and Antonyms

**Grammar:** Identifying Common Errors in Writing with Reference to Misplaced Modifiers and Tenses and Question Tags

**Reading:** Sub-skills of Reading- Skimming and Scanning

**Writing:** Nature and Style of Sensible Writing- Defining- Describing Objects, Places and Events - Classifying- Providing Examples or Evidence, E-mail writing and practices.

## UNIT -IV

'What Should You Be Eating' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

**Vocabulary:** Idioms and phrases, Phrasal Verbs and One word substitutions

**Grammar:** Active voice and Passive voice- Redundancies and Clichés in Oral and Written Communication.

**Reading:** Comprehension- Intensive Reading and Extensive Reading

**Writing:** Writing Practices--Writing Introduction and Conclusion - Essay Writing-Précis Writing.

## UNIT -V

'How a Chinese Billionaire Built Her Fortune' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

**Vocabulary:** Standard Abbreviations in English and Technical Vocabulary and their usage

**Grammar:** Reported speech and Common Errors in English

**Reading:** Reading Comprehension-Exercises for Practice

**Writing:** Report writing - Introduction - Characteristics of a Report - Categories of Reports, Formats- Structure of Reports (Manuscript Format) -Types of Reports - Writing a Report.

**PRESCRIBED TEXTBOOK:**

1. Sudarshana, N.P. and Savitha, C. (2018). English for Engineers. Cambridge University Press.

**REFERENCES:**

1. Swan, M. (2016). Practical English Usage. Oxford University Press.
2. Kumar, S and Lata, P.(2018). Communication Skills. Oxford University Press.
3. Wood, F.T. (2007). Remedial English Grammar. Macmillan.
4. Zinsser, William. (2001). On Writing Well. Harper Resource Book.
5. Hamp-Lyons, L. (2006). Study Writing. Cambridge University Press.
6. Exercises in Spoken English. Parts I -III. CIEFL, Hyderabad. Oxford University Press.

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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2002ES01) BASIC ELECTRICAL ENGINEERING

B.Tech. I Year II Sem      L T P C  
3 0 0 3

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### COURSE OBJECTIVES:

- To introduce the concepts of electrical circuits and its components
- To understand magnetic circuits, DC circuits and AC single phase & three phase circuits
- To study and understand the different types of DC/AC machines and Transformers.
- To impart the knowledge of various electrical installations.
- To introduce the concept of power, power factor and its improvement.

### Course Outcomes:

- To analyze and solve electrical circuits using network laws and theorems.
- To understand and analyze basic Electric and Magnetic circuits
- To study the working principles of Electrical Machines
- To introduce components of Low Voltage Electrical Installations

### UNIT-I: D.C. Circuits

Electrical circuit elements (R, L and C), voltage and current sources, KVL & KCL, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. Time-domain analysis of first-order RL and RC circuits.

### UNIT-II: A.C. Circuits

Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance in series RL- C circuit.

Three-phase balanced circuits, voltage and current relations in star and delta connections.

### UNIT-III: Transformers

Ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer connections.

### UNIT-IV: Electrical Machines

Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor. Single-phase induction motor. Construction, working, torque-speed characteristic and speed control of separately excited dc motor. Construction and working of synchronous generators.

**UNIT-V: Electrical Installations**

Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.

**TEXT-BOOKS / REFERENCE - BOOKS:**

1. Basic Electrical Engineering - D.P. Kothari and I.J. Nagrath, 3rd edition 2010, Tata McGraw Hill.
2. D.C. Kulshreshtha, "Basic Electrical Engineering", McGrawHill, 2009.
3. L.S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011
4. Electrical and Electronics Technology, E. Hughes, 10th Edition, Pearson, 2010
5. Electrical Engineering Fundamentals, Vincent Deltoro, Second Edition, Prentice Hall India, 1989.

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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2003ES61) ENGINEERING WORKSHOP

B.Tech. I Year II Sem

L T P C

1 0 3 2.5

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### COURSE OBJECTIVES:

1. To Study of different hand operated power tools, uses and their demonstration.
2. To gain a good basic working knowledge required for the production of various engineering products.
3. To provide hands on experience about use of different engineering materials, tools, equipment's and processes those are common in the engineering field.
4. To develop a right attitude, team working, precision and safety at workplace.
5. To study commonly used carpentry joints and to have practical exposure to various welding and joining processes.

**Course Outcomes:** At the end of the course, the student will be able to:

1. Study and practice on machine tools and their operations
2. Practice on manufacturing of components using workshop trades including plumbing, fitting, carpentry, foundry, house wiring and welding.
3. Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
4. Apply basic electrical engineering knowledge for house wiring practice.
5. Study commonly used carpentry joints.

### I. Carpentry

1. Cross lap joint
2. Mortise & tenon joint

### II. Fitting

1. V- fitting
2. Semi - Circular Fitting

### III. Tin Smithy

1. Making of Rectangular Tray
2. Making of Conical Funnel

### IV. Housing wiring

1. Two points controlled by two-one way switches( parallel connection)
2. One point controlled by two-two way switches( stair case connection).

**V. Foundry**

1. Single piece pattern
2. Multi-piece pattern

**VI. Black Smithy**

1. Round to Square
2. S - Hook

**Trades for Demonstration:**

1. Plumbing
2. Welding
3. Machine Shop
4. Metal Cutting (WaterPlasma)

**TEXT BOOKS:**

1. Workshop Manual, P. Kannaiah and K. L. Narayana, 3rd Edition, Scitech,2015
2. Elements of Workshop Technology Vol.1 & 2, S. K. Hajra Choudhury, A. K. Hajra Choudhury and Nirjhar Roy, 13th Edition, Media Promoters & Publishers Pvt. Ltd., 2010.

**REFERENCE BOOKS:**

1. Workshop Manual / Venkat Reddy/ BSP
2. Workshop Manual / K Venu Gopal / Anuradha

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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2000HS61) ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

B.Tech. I Year II Sem      L T P C  
0 0 2 1

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### COURSE OBJECTIVES:

1. To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning
2. To sensitize students to the nuances of English speech sounds, word accent, intonation and rhythm
3. To bring about a consistent accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking
4. To improve the fluency of students in spoken English and neutralize their mother tongue influence
5. To train students to use language appropriately for public speaking and interviews
6. To foster better understanding of nuances of English language through audio- visual experience and group activities
7. To inculcate Neutralization of accent for intelligibility
8. To enhance students' speaking skills with clarity and confidence which in turn enhances their employability skills

### Syllabus

English Language and Communication Skills Lab (ELCS) shall have two parts:

- a. Computer Assisted Language Learning (CALL) Lab
- b. Interactive Communication Skills (ICS) Lab

### Listening Skills

#### Objectives

1. To enable students develop their listening skills so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation
2. To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions

Students should be given practice in listening to the sounds of the language, to be able to recognize them and find the distinction between different sounds, to be able to mark stress and recognize and use the right intonation in sentences.

- Listening for general content
- Listening to fill up information
- Intensive listening



- Listening for specific information

### Speaking Skills

#### Objectives

- 1.To involve students in speaking activities in various contexts
- 2.To enable students express themselves fluently and appropriately in social and professional contexts

- Oral practice: Just A Minute (JAM) Sessions
- Describing objects/situations/people
- Role play - Individual/Group activities
- Group Discussion - Group activities

The following course content is prescribed for the English Language and Communication Skills Lab based on Unit-6 of AICTE Model Curriculum 2018 for B.Tech First Year English. As the syllabus is very limited, it is required to prepare teaching/learning materials by the teachers collectively in the form of handouts based on the needs of the students in their respective colleges for effective teaching/learning and timesaving in the Lab)

#### Exercise - I CALL Lab:

Understand: Listening Skill- Its importance - Purpose- Process- Types- Barriers of Listening.

Practice: Introduction to Phonetics - Speech Sounds - Vowels and Consonants.

#### ICS Lab:

Understand: Communication at Work Place- Spoken vs. Written language.

Practice: Ice-Breaking Activity and JAM Session- Situational Dialogues - Greetings - Taking Leave  
- Introducing Oneself and Others.

#### Exercise - II CALL Lab:

Understand: Structure of Syllables - Word Stress and Rhythm- Weak Forms and Strong Forms in Context.

Practice: Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms in Context.

#### ICS Lab:

Understand: Features of Good Conversation - Non-verbal Communication.

Practice: Situational Dialogues - Role-Play- Expressions in Various Situations -Making Requests and Seeking Permissions - Telephone conversation.

#### Exercise - III CALL Lab:

Understand: Intonation-Errors in Pronunciation-the Influence of Mother Tongue (MTI). Practice: Common Indian Variants in Pronunciation - Differences in British and American Pronunciation.

#### ICS Lab:

Understand:Telephonic Etiquette, How to make Formal Presentations.

Practice:Formal Telephone conversation and Formal Presentations.

**Exercise - IV CALL Lab:**

Understand: Consonant Clusters, Plural and Past tense Markers

Practice: Words often Misspelled - Confused/ Misused.

**ICS Lab:**

Understand: Public Speaking - Exposure to Structured Talks.

Practice: Making a Short Speech - Extempore.

**Exercise - V CALL Lab:**

Understand: Listening for General and Specific Details.

Practice: Listening Comprehension Tests.

**ICS Lab:**

Understand: Group Discussion and Interview Skills.

Practice: Case study Group Discussions and Mock Interviews.

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**Minimum Requirement of infrastructural facilities for ELCS Lab:****1. Computer Assisted Language Learning (CALL)Lab:**

The Computer Assisted Language Learning Lab has to accommodate 40 students with 40 systems, with one Master Console, LAN facility and English language learning software for self- study by students.

**System Requirement (Hardware component):**

Computer network with LAN facility (minimum 40 systems with multimedia) with the following specifications:

- i) Computers with Suitable Configuration
- ii) High Fidelity Headphones

**2. Interactive Communication Skills (ICS) Lab:**

The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio- visual aids with a Public-Address System, LCD and a projector etc

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2005ES62) PYTHON PROGRAMMING LAB

B.Tech. I Year II Sem

L T P C

0 0 3 1.5

### COURSE OBJECTIVES:

- Introduce core programming basics and program design with functions using Python programming Language.
- To understand a range of Object-Oriented Programming, as well as in-depth data and information processing techniques.
- To understand the high-performance programs designed to strengthen the practical expertise.

### Course Outcomes

- Student able to understand the basic concepts scripting and the contributions of scripting language
- Ability to explore python especially the object oriented concepts, and the built in objects of Python.
- Ability to create practical and contemporary applications such as TCP/IP network programming, Web applications, discrete event simulations

### Week 1:

1. Python program to print "HelloPython"
2. Write a program that computes and prints the result of  $512 \div 282 / 47 \cdot 48 + 5$  .  
It is roughly .1017
3. Ask the user to enter a number. Print out the square of the number but use the sep optional argument to print it out in a full sentence that ends in a period. Sample output is shown below.  
Enter a number: 5  
The square of 5 is 25.
4. Ask the user to enter a number x. Use the sep optional argument to print out x, 2x, 3x, 4x, and 5x, each separated by three dashes, like below.  
Enter a number: 7  
7---14---21---28---35

### Week 2:

1. Write a program that asks the user to enter three numbers (use three separate input statements). Create variables called total and average that hold the sum and average of the three numbers and print out the values of total and average.
2. A lot of cell phones have tip calculators. Write one. Ask the user for the price of the meal and the percent tip they want to leave. Then print both the tip amount and the total bill with the tip included.

3. Write a program which will find all such numbers which are divisible by 7 but are not a multiple of 5, between 2000 and 3200 (both included). The numbers obtained should be printed in a comma-separated sequence on a single line.

Hints: Consider use range(#begin, #end) method

4. Write a program that calculates and prints the value according to the given formula:  $Q = \text{Square root of } [(2 * C * D)/H]$

Following are the fixed values of C and H: C is 50. H is 30. D is the variable whose values should be input to your program in a comma-separated sequence, let us assume the following comma separated input sequence is given to the program: 100,150,180 The output of the program

Hint:

If the output received is in decimal form, it should be rounded off to its nearest value (for example, if the output received is 26.0, it should be printed as 26) 18, 22, 24 should be:

### Week 3:

1. Write a program that asks the user to enter a length in centimeters. If the user enters a negative length, the program should tell the user that the entry is invalid. Otherwise, the program should convert the length to inches and print out the result. There are 2.54 centimeters in an inch.
2. Ask the user for a temperature. Then ask them what units, Celsius or Fahrenheit, the temperature is in. Your program should convert the temperature to the other unit. The conversions are  $F = 9/5 C + 32$  and  $C = 5/9 (F - 32)$
3. Ask the user to enter a temperature in Celsius. The program should print a message based on the temperature:
  - If the temperature is less than -273.15, print that the temperature is invalid because it is below absolute zero.
  - If it is exactly -273.15, print that the temperature is absolute 0.
  - If the temperature is between -273.15 and 0, print that the temperature is below freezing.
  - If it is 0, print that the temperature is at the freezing point.
  - If it is between 0 and 100, print that the temperature is in the normal range.
  - If it is 100, print that the temperature is at the boiling point.
  - If it is above 100, print that the temperature is above the boiling point
4. Write a program that asks the user how many credits they have taken. If they have taken 23 or less, print that the student is a freshman. If they have taken between 24 and 53, print that they are a sophomore. The range for juniors is 54 to 83, and for seniors it is 84 and over.

### Week 4:

1. A year is a leap year if it is divisible by 4, except that years divisible by 100 are not leap years unless they are also divisible by 400. Write a program that asks the user for a year and prints out whether it is a leap year or not
2. Write a multiplication game program for kids. The program should give the player ten randomly generated multiplication questions to do. After each, the program should tell them whether they got it right or wrong and what the correct answer is.

Question 1:  $3 \times 4 = 12$

Right!

Question 2:  $8 \times 6 = 44$

Wrong.

The answer is 48.

...

...

Question 10:  $7 \times 7 = 49$

Right.

3. A jar of Halloween candy contains an unknown amount of candy and if you can guess exactly how much candy is in the bowl, then you win all the candy. You ask the person in charge the following: If the candy is divided evenly among 5 people, how many pieces would be left over? The answer is 2 pieces. You then ask about dividing the candy evenly among 6 people, and the amount left over is 3 pieces. Finally, you ask about dividing the candy evenly among 7 people, and the amount left over is 2 pieces. By looking at the bowl, you can tell that there are less than 200 pieces. Write a program to determine how many pieces are in the bowl

Write a program that asks the user to enter a value  $n$ , and then computes  $(1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n}) \cdot \ln(n)$ . The  $\ln$  function is `log` in the `math` module

#### Week 5:

- A number is called a perfect number if it is equal to the sum of all of its divisors, not including the number itself. For instance, 6 is a perfect number because the divisors of 6 are 1, 2, 3, 6 and  $6 = 1 + 2 + 3$ . As another example, 28 is a perfect number because its divisors are 1, 2, 4, 7, 14, 28 and  $28 = 1 + 2 + 4 + 7 + 14$ . However, 15 is not a perfect number because its divisors are 1, 3, 5, 15 and  $15 \neq 1 + 3 + 5$ . Write a program that finds all four of the perfect numbers that are less than 10000.
- Ask the user to enter 10 test scores. Write a program to do the following:
  - Print out the highest and lowest scores.
  - Print out the average of the scores.
  - Print out the second largest score.
  - If any of the scores is greater than 100, then after all the scores have been entered, print a message warning the user that a value over 100 has been entered.
  - Drop the two lowest scores and print out the average of the rest of them
- Write a program that computes the factorial of a number. The factorial,  $n!$ , of a number  $n$  is the product of all the integers between 1 and  $n$ , including  $n$ . For instance,  $5! = 1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 = 120$ . [Hint: Try using a multiplicative equivalent of the summing technique.]

#### Week 6:

- Write a program that asks the user for a number and then prints out the sine, cosine, and tangent of that number.
- The Fibonacci numbers are the sequence below, where the first two numbers are 1, and each number

thereafter is the sum of the two preceding numbers. Write a program that asks the user how many Fibonacci numbers to print and then prints that many.

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89 . . .

3. Use a for loop to print a triangle like the one below. Allow the user to specify how high the triangle should be.

```
*
**
***
****
*****
```

### Week 7:

1. Use for loops to print a diamond like the one below. Allow the user to specify how high the diamond should be.

```
*
***
*****
*****
*****
***
*
```

2. Write a program that asks the user to enter an angle between  $0^\circ$  and  $180^\circ$ . Using an expression with the modulo operator, convert the angle to its equivalent between  $0^\circ$  and  $360^\circ$ .
3. (a) One way to find out the last digit of a number is to mod the number by 10. Write a program that asks the user to enter a power. Then find the last digit of 2 raised to that power.
- (b) One way to find out the last two digits of a number is to mod the number by 100. Write a program that asks the user to enter a power. Then find the last two digits of 2 raised to that power.
- (c) Write a program that asks the user to enter a power and how many digits they want. Find the last that many digits of 2 raised to the power the user entered

### Week 8:

1. The GCD (greatest common divisor) of two numbers is the largest number that both are divisible by. For instance,  $\text{gcd}(18, 42)$  is 6 because the largest number that both 18 and 42 are divisible by is 6. Write a program that asks the user for two numbers and computes their gcd. Shown below is a way to compute the GCD, called Euclid's Algorithm.
- First compute the remainder of dividing the larger number by the smaller number
  - Next, replace the larger number with the smaller number and the smaller number with the remainder.
  - Repeat this process until the smaller number is 0. The GCD is the last value of the larger number.

2. Write a program that asks the user to enter a string. The program should then print the following:
  - (a) The total number of characters in the string
  - (b) The string repeated 10 times
  - (c) The first character of the string (remember that string indices start at 0)
  - (d) The first three characters of the string
  - (e) The last three characters of the string
  - (f) The string backwards
  - (g) The seventh character of the string if the string is long enough and a message otherwise
  - (h) The string with its first and last characters removed
  - (i) The string in all caps
  - (j) The string with every a replaced with an e
  - (k) The string with every letter replaced by a space

**Week 9:**

1. Write a program that asks the user to enter a string. The program should create a new string called new string from the user's string such that the second character is changed to an asterisk and three exclamation points are attached to the end of the string. Finally, print new string. Typical output is shown below: Enter your string: Qbert Q\*ert!!!
2. Write a program that computes the net amount of a bank account based a transaction log from console input. The transaction log format is shown as following:  
D 100 W 200 D means deposit while W means withdrawal.  
Suppose the following input is supplied to the program:D 300D 300 W200D 100Then, the output should be:  
500

**Week 10:**

1. A website requires the users to input username and password to register. Write a program to check the validity of password input by users.

Following are the criteria for checking the password:

1. At least 1 letter between [a-z]
2. At least 1 number between [0-9]
1. At least 1 letter between [A-Z]
3. At least 1 character from [ \$#@ ]
4. Minimum length of transaction password: 6
5. Maximum length of transaction password: 12

Your program should accept a sequence of comma separated passwords and will check them according to the above criteria. Passwords that match the criteria are to be printed, each separated by a comma.

**Example**

If the following passwords are given as input to the program:

ABd1234@1,a F1#,2w3E\*,2We3345

Then, the output of the program should be:

ABd1234@1

2. Write a program that accepts sequence of lines as input and prints the lines after making all characters in the sentence capitalized

Suppose the following input is supplied to the program:

Hello world

Practice makes perfect

Then, the output should be:

HELLO WORLD

**PRACTICE MAKES PERFECT**

3. The goal of this exercise is to see if you can mimic the behavior of the in operator and the count and index methods using only variables, for loops, and if statements.
- (a) Without using the in operator, write a program that asks the user for a string and a letter and prints out whether the letter appears in the string.
  - (b) Without using the count method, write a program that asks the user for a string and a letter and counts how many occurrences there are of the letter in the string.
  - (c) Without using the index method, write a program that asks the user for a string and a letter and prints out the index of the first occurrence of the letter in the string. If the letter is not in the string, the program should say so.

**TEXT BOOK:**

1. Core Python Programming, Wesley J. Chun, Second Edition, Pearson



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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2002ES61) BASIC ELECTRICAL ENGINEERING LAB

B.Tech. I Year II Sem

L T P C

0 0 2 1

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### COURSE OBJECTIVES:

- To analyze a given network by applying various electrical laws and network theorems
- To know the response of electrical circuits for different excitations
- To calculate, measure and know the relation between basic electrical parameters.
- To analyze the performance characteristics of DC and AC electrical machines

### Course Outcomes:

- Get an exposure to basic electrical laws.
- Understand the response of different types of electrical circuits to different excitations.
- Understand the measurement, calculation and relation between the basic electrical parameters
- Understand the basic characteristics of transformers and electrical machines.

### List of experiments/demonstrations:

1. Verification of Ohm's Law
2. Verification of KVL and KCL
3. Transient Response of Series RL and RC circuits using DC excitation
4. Transient Response of RLC Series circuit using DC excitation
5. Resonance in series RLC circuit
6. Calculations and Verification of Impedance and Current of RL, RC and RLC series circuits
7. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single Phase Transformer
8. Load Test on Single Phase Transformer (Calculate Efficiency and Regulation)
9. Three Phase Transformer: Verification of Relationship between Voltages and Currents (Star-Delta, Delta-Delta, Delta-star, Star-Star)
10. Measurement of Active and Reactive Power in a balanced Three-phase circuit
11. Performance Characteristics of a Separately/Self Excited DC Shunt/Compound Motor
12. Torque-Speed Characteristics of a Separately/Self Excited DC Shunt/Compound Motor
13. Performance Characteristics of a Three-phase Induction Motor
14. Torque-Speed Characteristics of a Three-phase Induction Motor
15. No-Load Characteristics of a Three-phase Alternator

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2000MC02) FRENCH LANGUAGE

B.Tech. I Year II Sem      L T P C  
2 0 0 0

### INTRODUCTION:

In view of the growing importance of foreign languages as a communication tool in some countries of the world, French has been identified as one of the most popular languages after English. As a result, French program is introduced to develop the linguistic and communicative skills of engineering students and to familiarize them to the French communication skills. This course focuses on basic oral skills.

### COURSE OBJECTIVES:

- To inculcate the basic knowledge of the French language.
- To hone the basic sentence constructions in day to day expressions for communication in their vocation.

Course Outcomes:

- The students will be able to communicate in French at A1 level.
- The student will have an advantage in the competitive job market.
- This course benefits the graduates when pursuing study opportunities in the countries where French is the official language.

### UNIT - I:

Speaking: Introduction to the French language and culture - Salutations - French alphabet - Introducing people

Writing: Understand and fill out a form

Grammar: The verbs "to be" and "to have" in the present tense of the indicative Vocabulary: The numbers from 1 to 20 - Professions - Nationalities

### UNIT - II:

Speaking: Talk about one's family - description of a person - express his tastes and preferences

-express possession - express negation Writing: Write and understand a short message

Grammar: Nouns (gender and number) - Articles - The -er verbs in the present - Possessive adjectives - Qualifying adjectives

Vocabulary: The family - Clothes - Colors - The numbers from 1 to 100 - The classroom

### UNIT - III

Speaking: Talk about your daily activities - be in time - ask and indicate the date and time - talk about sports and recreation - express the frequency Writing: A letter to a friend

Grammar - The expression of time - Their verbs in the present - The verbs do, go, take, come,

-Adverbs - Reflexive verbs

Vocabulary - The days and months of theyear-The sports -Hobbies

#### **UNIT - IV**

Speaking: Express the quantity - ask and give the price - express the need, the will and the capacity - compare (adjective) - speak at the restaurant / in the shops

Writing: A dialogue between a vendor and a customer at the market

Grammar: Verbs "to want", "to can" - Express capacity / possibility - Express will / desire -the future tense

Vocabulary: The food - Meals - Fruits and vegetables - The parts of the body

#### **UNIT - V**

Speaking: Express the prohibition and the obligation - describe an apartment - talk about the weather / ask the weather - ask the opinion - give your opinion - express your agreement or disagreement

Writing: Descriptions

Grammar: Demonstrative adjectives -Prepositions - The verb 'must' to indicate obligation and necessity in the present

Vocabulary: Seasons - Holidays - The city - Furniture

NOTE: The students are exposed to simple listening and reading activities.

#### **REFERENCE BOOKS**

1. Apprenons le Français 1& 2, New SaraswatiHouse,2015
2. A propos, A1, LangersInternational,2010
3. Easy French Step-by-step by MyrnaBellRochester
4. Ultimate French Beginner-Intermediate (Coursebook) ByLividLanguage
5. Ã L'Aventure: An Introduction to French Language and Francophone Cultures by Evelyne Charvier-Berman, AnneC.Cummings.

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2000BS04) PROBABILITY AND STATISTICS

B.Tech. II Year I Sem

L T P C

3 1 0 4

### COURSE OBJECTIVES:

- Understand a random variable that describes randomness or an uncertainty in certain realistic situation. It can be of either discrete or continuous type.
- In the discrete case, study of the binomial and the Poisson random variables and the Normal random variable for the continuous case predominantly describe important probability distributions. Important statistical properties for these random variables provide very good insight and are essential for industrial applications.
- Most of the random situations are described as functions of many single random variables.
- The types of sampling, Sampling distribution of means, Sampling distribution of variance, Estimations of statistical parameters, Testing of hypothesis of few unknown statistical parameters.

### Course Outcomes:

Students would be able to identify distribution in certain realistic situation. It is mainly useful for circuits as well as non-circuit branches of engineering. Also able to differentiate among many random variables involved in the probability models. It is quite useful for all branches of engineering.

The student would be able to calculate mean and proportions (small and large sample) and to make important decisions from few samples which are taken out of unmanageably huge populations.

### UNIT - I

#### Probability and Discrete Probability Distributions:

Probability Definition, conditional probability, Baye's theorem (without proof) ; Discrete Random variables , Binomial and Poisson distributions and their properties. (Without proof)

### UNIT - II

**Continuous Probability Distributions:** Continuous random variables and their properties (without proof), distribution functions , Normal distribution.

**Curve Fitting:** Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and exponential curves.

### UNIT - III

**Sampling Distribution:** Definitions of population, sample, statistic, parameter. Types of sampling, Expected values of Sample mean and variance, sampling distribution, Standard error, Sampling distribution of mean and sampling distribution of variance.

### UNIT - IV

Testing of hypothesis: Null hypothesis, Alternate hypothesis, type I, & type II errors - critical region, confidence

interval, Level of significance, one tailed test and two tailed test. Large sample tests:

- i. Test of Equality of means of two samples equality of sample mean and population mean (cases of known variance & unknown variance, equal and unequal variances)
- ii. Tests of significance difference between sample proportion and population proportion & difference between two sample proportions.

#### UNIT - V

**Small sample tests:** Student t-distribution, its properties; Test of significance difference between sample mean and population mean; difference between means of two small samples. Snedecor's F-distribution and its properties. Test of equality of two population variances. Chi-square distribution, its properties, Chi-square test of goodness of fit.

#### TEXT BOOKS:

1. Higher Engineering Mathematics by Dr. B.S Grewal, Khanna Publishers
2. Probability and Statistics for Engineers and Scientists by Sheldon M. Ross, Academic Press

#### REFERENCE BOOKS:

1. Mathematics for Engineers by K.B. Datta and M.S. Sriniva, Cengage Publications
2. Probability and Statistics by T.K.V. Iyengar & B. Krishna Gandhi Et
3. Fundamentals of Mathematical Statistics by S C Gupta and V.K. Kapoor
4. O. Neil by P&S only applications
5. Veerajan T., Engineering Mathematics (for semester III), Tata McGraw-Hill, New Delhi, 2010. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
6. P.G. Hoel, S.C. Port and C.J. Stone, Introduction to Probability theory, Universal Book Stall, 2003 (Reprint).

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2004ES01) ANALOG AND DIGITAL ELECTRONIC CIRCUITS

B.Tech. II Year I Sem      L T P C  
3 0 0 3

### COURSE OBJECTIVES:

- To familiarize the student with the principle of operation, analysis and design of Junction diode, BJT and FET amplifier circuits, transistors and field effect transistors.
- To understand diode as rectifier.
- To apply principles of Boolean algebra to minimize logic expressions using minimization techniques.
- To outline the formal procedures to design the combinational and sequential circuits of desired functionality.

### Course Outcomes:

- Upon successful completion of this course, the student will be able to:
- Understand and analyze the different types of diodes, operation and its characteristics.
- Design and analyze the DC bias circuitry of BJT and FET.
- Perform arithmetic operations on different number systems and to apply the principles of Boolean algebra to minimize logic expressions.
- Analyze some basic components used in digital systems such as adder and subtractor, decoder, encoder, multiplexer, flip-flops, registers and counters.
- Design various combinational PLDs such as ROMs, PALs, PALs.

### UNIT-I

Junction Diode: P-N Junction as a Diode, Volt- Ampere Characteristics, Temperature dependence of VI characteristics, Transition and Diffusion Capacitances, Breakdown Mechanisms in Semiconductor Diodes, Zener Diode Characteristics.

Rectifiers and Filters: The P-N junction as a Rectifier, Half wave Rectifier, Full wave Rectifier, Inductor Filters, and Capacitor Filters.

### UNIT-II

Bipolar Junction Transistor: The Junction Transistor, Transistor as an Amplifier, Common Base, Common Emitter and Common Collector Configurations, BJT Specifications, BJT Hybrid Model, Comparison of CB, CE, and CC Amplifier Configurations.

Transistor Biasing and Stabilization: Operating Point, The DC and AC Load lines, Need for Biasing, Bias Compensation using Diodes and Transistors, Thermal Runaway, Analysis of a Transistor Amplifier Circuit using h-Parameters,

**UNIT-III**

Field Effect Transistor: The Junction Field Effect Transistor, Volt-Ampere characteristics, MOSFET: MOSFET Characteristics in Enhancement and Depletion modes, Comparison of BJT and FET.

Digital Systems: Binary Numbers, Number base conversions, Octal, Hexadecimal and other base numbers, complements, binary codes, Error detection and correction, Basic theorems and properties of Boolean Algebra, Boolean functions, canonical and standard forms.

**UNIT -IV**

Gate-Level Minimization: The K-Map Method, Three-Variable Map, sum of products, product of sums simplification, Don't care conditions, NAND and NOR implementation, Exclusive-OR function.

Combinational Logic Circuits: Combinational circuit for different code converters, Binary Adder-Subtractor, Decimal Adder, Binary Multiplier, Decoders, Encoders, Multiplexers, De-multiplexers.

**UNIT -V**

Sequential Logic Circuits: Sequential Circuits, Latches, Flip-flops, analysis of clocked sequential circuits, Registers, Shift registers, Ripple counters, Synchronous counters.

Memory: Introduction, Random-Access memory, ROM, Programmable Logic Array, Programmable Array Logic.

**TEXT BOOKS:**

1. Millman's Electronic Devices and Circuits - J. Millman, C.C.Halkias, and Satyabrata Jit, 2 Ed.,1998,TMH
2. Electronic Devices and Circuits - David A. Bell, 5Ed,Oxford.
3. M. Morris Mano, Michael D. Ciletti (2008), Digital Design, 4th edition, Pearson Education/PHI,India.
4. Thomas L.Floyd (2006), Digital fundamentals, 9th edition, Pearson Education International.

**REFERENCE BOOKS:**

1. Integrated Electronics - J. Millman and Christos C. Halkias, 1991 Ed., 2008,TMH.
2. Electronic Devices and Circuits - K. Lal Kishore, 2ndEd.,2005,BSP.
3. Electronic Devices and Circuits - S.Salivahanan, N.Suresh Kumar, A. Vallavaraj, 2nd Ed., 2008, TMH.
4. Zvi. Kohavi (2004), Switching and Finite Automata Theory, Tata McGraw Hill,India.
5. C.V.S. Rao (2009), Switching and Logic Design, 3rd edition, Pearson Education,India.

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2005PC01) DATA STRUCTURES AND ALGORITHMS

B.Tech. II Year I Sem      L T P C  
3 0 0 3

### COURSE OBJECTIVES:

- To impart the basic concepts of data structures and algorithms.
- To understand concepts about searching and sorting techniques
- To understand basic concepts about stacks, queues, lists trees and graphs.
- To enable them to write algorithms for solving problems with the help of fundamental data Structures

### Course Outcomes:

At the end of the course the students are able to:

- For a given Algorithm student will able to analyze the algorithms to determine time & computation complexity and justify the correctness.
- For a given Search problem (Linear Search and Binary Search) student will able to implement it. For a given problem of Stacks, Queues and linked list student will able to implement it and analyze the same to determine the time and computation complexity.
- Student will able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity. Student will able to implement Graph search and traversal algorithms and determine the time and computation complexity.

### UNIT-I

**Introduction:** Basic Terminologies: Elementary Data Organizations. Data Structure Operations: insertion, deletion, traversal etc. Analysis of an Algorithm, Asymptotic Notations, Time-Space trade off. Searching: Linear Search and Binary Search Techniques and their complexity analysis.

### UNIT-II

**Stacks and Queues:** ADT Stack and its operations: Algorithms and their complexity analysis, Applications of Stacks: Expression Conversion and evaluation - corresponding algorithms and complexity analysis. ADT Queue: Types of Queue: Simple Queue, Circular Queue, Priority Queue. Operations on each types of Queues, Algorithms and their analysis.

### UNIT-III

**Linked Lists:** Singly linked lists: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list; Linked representation of Stack and Queue, Header nodes. **Doubly Linked List:** operations on it and algorithmic analysis. Circular Linked List: all operations their algorithms and complexity analysis.



**UNIT-IV**

**Trees: Basic Tree Terminologies:** Different types of Trees: Binary Tree, Threaded Binary Tree, Binary Search Tree, AVL Tree: Tree operations on each of the trees and their algorithms with complexity analysis. Applications of Binary Trees, B-Tree, B+ Tree: definitions, algorithms and analysis.

**UNIT-V**

**Sorting and Hashing:** Objective and properties of different sorting algorithms: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort. Performance and Comparison among all the methods, Hashing. Graph: Basic Terminologies & Representations, Graph search and traversal algorithms & complexity analysis.

**TEXT BOOKS:**

1. "Fundamentals of Data Structures", Illustrated Edition by Ellis Horowitz, Sartaj Sahni, Computer Science Press.

**REFERENCE BOOKS:**

1. Algorithms, Data Structures, and Problem Solving with C++", Illustrated Edition by Mark Allen Weiss, Addison-Wesley Publishing Company
2. "How to Solve it by Computer", 2nd Impression by R. G. Dromey, Pearson Education.

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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2005PC04) OBJECT ORIENTED PROGRAMMING THROUGH JAVA

B.Tech. II Year I Sem      L T P C  
3 0 0 3

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### COURSE OBJECTIVES:

- The objective of this course is to provide object-oriented concepts through which robust, secured and reusable software can be developed.
- To understand object-oriented principles like abstraction, encapsulation, inheritance and polymorphism and apply them in solving problems.
- To understand the principles of inheritance and polymorphism and demonstrate how they relate to the design of abstract classes.
- To understand the implementation of packages and interfaces.
- To understand the concepts of exception handling, multithreading and collection classes.
- To understand the design of Graphical User Interface using applets and swing controls.

### Course Outcomes:

At the end of the course the students are able to:

- An understanding of the principles and practice of object-oriented analysis and design in the construction of robust, maintainable programs which satisfy their requirements;
- A competence to design, write, compile, test and execute straightforward programs using a high-level language;
- An appreciation of the principles of object-oriented programming;
- An awareness of the need for a professional approach to design and the importance of good documentation to the finished programs.
- Be able to implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.
- Demonstrate the ability to use simple data structures like arrays in a Java program.
- Be able to make use of members of classes found in the Java API.
- Demonstrate the ability to employ various types of selection constructs in a Java program. Be able to employ a hierarchy of Java classes to provide a solution to a given set of requirements.
- Able to develop applications using Applet and Swings.

### UNIT I

**Object-oriented thinking**- A way of viewing world - Agents and Communities, messages and methods, Responsibilities, Classes and Instances, Class Hierarchies- Inheritance, Method binding, Overriding and Exceptions, Summary of Object-Oriented concepts.

**An Overview of Java-** History of Java, comments, Data types, Variables, Constants, Scope and Lifetime of variables, Operators, Type conversion and casting, Enumeration, Control flow? block scope, conditional statements, loops, break and continue statements, simple java standalone programs, arrays, console input and output, classes, methods, constructors, static, this keyword, recursion, exploring string classes and garbage collection.

## UNIT - II

**Inheritance-**Inheritance hierarchy, super keyword, preventing inheritance: final classes and methods, the Object class and its methods.

Polymorphism-dynamic binding, Constructor and method overloading, method overriding, abstract classes.

**Interfaces-** Interfaces Vs Abstract Classes, defining an interface, implementing interfaces, accessing implementations through interface references, extending interface, inner class.

**Packages-**Defining, creating and accessing a package, CLASSPATH, Access modifiers, importing packages.

## UNIT-III

**Exception Handling** - Dealing with errors, benefits of exception handling, the classification of exceptions ? exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, creating own exception subclasses.

**Multithreading** - Differences between multiple processes and multiple threads, thread lifecycle, creating threads, interrupting threads, thread priorities, synchronizing threads, inter?thread communication-producer consumer problem.

## UNIT-IV

**Collection Framework in Java** - Introduction to java collections, Overview of java collection framework, Commonly used collection classes?ArrayList, LinkedList, HashSet, TreeSet, Map- HashMap, TreeMap, Legacy Classes-Vector, Stack, Hashtable.

Other Utilities-Scanner, String Tokenizer, Random, Date.

**Files-**Streams?Byte Streams, Character Streams, Text input/output, Binary input /output , File Management using File class.

## UNIT-V

**Applets** - Inheritance hierarchy for applets, differences between applets and applications, Life cycle of an applet and Passing parameters to applets

**GUI Programming - Swing** - The AWT class hierarchy, Introduction to Swing, Swing Vs AWT, Hierarchy for Swing components, Overview of Swing components - JButton, JLabel, JTextField, JCheckBox, RadioButton, JTextArea, etc simple Swing applications, Layout managers- FlowLayout, BorderLayout, GridLayout and GridbagLayout.

**Event Handling** : Events, Event sources, Event classes, Event Listeners, Delegation event model, Handling Mouse and Key events, Adapter classes.

## TEXTBOOKS:

1. Java Fundamentals-A Comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.
2. Understanding Object-Oriented Programming with Java, updated edition, T. Budd, Pearson Education

**REFERENCE BOOKS:**

1. Java for Programmers, P.J.Deitel and H.M.Deitel, PEA(or) Java: Howto Program , P.J.Deitel andH.M.Deitel,PHI
2. ObjectOrientedProgrammingthroughJava,P.RadhaKrishna,UniversitiesPress.
3. Thinking in Java, BruceEckel,PE
4. Programming in Java, S.Malhotra and S.Choudhary, Oxford UniversitiesPress.
5. Design Patterns Erich Gamma, Richard Helm, Ralph Johnson and JohnVlissides

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2005PC03) DISCRETE MATHEMATICS

B.Tech. II Year I Sem      L T P C  
3 0 0 3

### COURSE OBJECTIVES:

- Use mathematically correct terminology and notation.
- Construct correct direct and indirect proofs.
- Use division into cases in a proof.
- Use counterexamples.
- Apply logical reasoning to solve a variety of problems.

### Course Outcomes:

At the end of the course the students are able to:

- For a given logic sentence express it in terms of predicates, quantifiers, and logical connectives
- For a given a problem, derive the solution using deductive logic and prove the solution based on logical inference
- For a given a mathematical problem, classify its algebraic structure Evaluate Boolean functions and simplify expressions using the properties of Boolean algebra Develop the given problem as graph networks and solve with techniques of graph theory.

### UNIT-I

**Propositional Logic:** Syntax, Semantics, Validity and Satisfiability, Basic Connectives and Truth Tables, Logical Equivalence: The Laws of Logic, Logical Implication, Rules of Inference, Normal Forms, Disjunctive and Conjunctive Normal Form, The use of Quantifiers.

### UNIT-II

**Sets, Relation and Function:** Operations and Laws of Sets, Cartesian Products, Binary Relation, Partial Ordering Relation, Equivalence Relation, Image of a Set, Sum and Product of Functions, Bijective functions, Inverse and Composite Function, Size of a Set, Finite and infinite Sets, Countable and uncountable Sets.

**Principles of Mathematical Induction:** The Well-Ordering Principle, Recursive definition, The Division algorithm: Prime Numbers, The Greatest Common Divisor: Euclidean Algorithm, The Fundamental Theorem of Arithmetic.

### UNIT-III

**Algebraic Structures and Morphism:** Algebraic Structures with one Binary Operation, Semi Groups, Monoids, Groups, Congruence Relation and Quotient Structures, Free and Cyclic Monoids and Groups, Permutation Groups, Substructures, Normal Subgroups, Algebraic

Structures with two Binary Operation, Rings, Integral Domain and Fields. Boolean Algebra and Boolean Ring, Identities of Boolean Algebra, Duality, Representation of Boolean Function.

**UNIT-IV**

**Elementary Combinatorics:** Basic counting techniques-inclusion and exclusion, pigeon-hole principle, permutations and combinations With Repetition and Without Repetition.

**UNIT-V**

**Graphs and Trees:** Graphs and thzir properties, Degree, Connectivity, Path, Cycle, Sub Graph, Isomorphism, Eulerian and Hamiltonian Walks, Graph Colouring, Colouring maps and Planar Graphs, Colouring Vertices, Colouring Edges, List Colouring, Perfect Graph, definition properties and Example, rooted trees, trees and sorting, weighted trees and prefix codes, Bi- connected component and Articulation Points, Shortestdistances.

**TEXT BOOKS:**

1. Kenneth H. Rosen, Discrete Mathematics and its Applications, Tata McGraw-Hill
2. Susanna S.Epp, Discrete Mathematics with Applications,4th edition, Wadsworth Publishing Co.Inc.
3. C L Liu and D P Mohapatra, Elements of Discrete Mathematics AComputer Oriented Approach, 3rd Edition by, Tata McGraw-Hill.

**REFERENCE BOOKS:**

1. J.P. Tremblay and R. Manohar, "Discrete Mathematical Structure and It's Application to Computer Science", TMGEdition,TataMcGraw-Hill
2. Norman L. Biggs, Discrete Mathematics, 2nd Edition, Oxford UniversityPress. Schaum's Outlines Series, Seymour Lipschutz,MarcLipson,
3. Discrete Mathematics, Tata McGraw-Hill

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2005PC61) DATA STRUCTURES & ALGORITHMS LAB

B.Tech. II Year I Sem

L T P C

0 0 3 1.5

### COURSE OBJECTIVES:

- To make the student learn a object oriented way of solving problems.
- To make the student write ADTS for all data structures.

### Course Outcomes:

At the end of the course the students are able to:

- For a given algorithm student will able to analyze the algorithms to determine time & computation complexity and justify the correctness.
- For a given Search problem (Linear Search and Binary Search) student will able to implement it.
- For a given problem of Stacks, Queues and linked list student will able to implement it and analyze the same to determine the time and computation complexity.
- Student will able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity.

**Week 1:** Write C programs to implement recursive and non recursive

- i) Linearsearch    ii) BinarySearch.

**Week 2:** Write C programs to implement

- i) Bubblesort    ii) Selectionsort  
iii) Quicksort    iv) Insertionsort

**Week3:** Write C programs to implement the following using an array.

- a) StackADT    b) Queue ADT

**Week4:** Write C programs to implement list ADT to perform following operations

- a) Insert an element into a list.    b) Delete an element from list  
c) Search for a key element in list    d) count number of nodes in list.

**Week5:** Write C programs to implement the following using a singly linked list.

- a) StackADT    b) Queue ADT.

**Week6:** Write C programs to implement the Deque (double ended queue) ADT using a doubly linked list and an array.

**Week7:** Write a C program to perform the following operations:

- a) Insert an element into a binary searchtree.
- b) Delete an element from a binary searchtree.
- c) Search for a key element in a binary searchtree.

**Week 8:** Write C programs for implementing the following sorting methods:

- a) Mergesort
- b) Heapsort

**Week 9:** Write C programs that use recursive functions to traverse the given binary tree in

- a)Preorder
- b) inorder and c) postorder.

**Week 10:** Write a C program to perform the following operations

- a) Insertion into aB-tree
- b) Deletion from a B-tree

**Week 11:** Write a C program to perform the following operation

- a) Insertion into an AVL-tree

**Week 12:** Write a C program to implement all the functions of a dictionary (ADT) using hashing.

#### **TEXT BOOKS:**

- C and Data Structures, Third Edition, P.Padma•nabham,BSPublications.
- C and Data Structures, Prof. P.S.Deshpande and Prof. O.G. Kakde,DreamtechPress.
- Data structures using C, A.K.Sharma, 2ndedition,Pearson.
- Data Structures using C, R.Thareja, OxfordUniversityPress.
- C and Data Structures, N.B.Venkateswarlu andE.V.Prasad,S.Chand.
- C Programming and Data Structures, P.Radha Krishna,Hi-TechPublishers.



# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2005PC63) OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

B.Tech. II Year I Sem

L T P C

0 0 3 1.5

### COURSE OBJECTIVES:

- To prepare students to become familiar with the Standard Java technologies of J2SE
- To prepare students to excel in Object Oriented programming and to succeed as a Java Developer through global rigorous education.
- To provide Students with a solid foundation in OOP fundamentals required to solve programming problems and also to learn Advanced Java topics like J2ME, J2EE, JSP and JavaScript
- To train Students with good OOP programming breadth so as to comprehend, analyze, design and create novel products and solutions for the real life problems.
- To inculcate in students professional and ethical attitude, multidisciplinary approach and an ability to relate java programming issues to broader application context.
- To provide student with an academic environment aware of excellence, written ethical codes and guidelines and lifelong learning needed for a successful professional career.

### Course Outcomes:

- Able to analyze the necessity for Object Oriented Programming paradigm and over structured programming and become familiar with the fundamental concepts in OOP.
- Demonstrate an ability to design and develop java programs, analyze, and interpret object oriented data and report results.
- Demonstrate an ability to design an object oriented system, Swing components or multithreaded process as per needs and specifications.
- Demonstrate an ability to visualize and work on laboratory and multidisciplinary tasks like console and windows applications both for standalone and Applets program

**Week 1:** a) Write a java program to find the Fibonacci series using recursive and non recursive functions.

a) Write a java program to multiply two given matrices.

**Week 2:** a) Write a java program for Method overloading and Constructor overloading.

b) Write a java program to display the employee details using Scanner class.

c) Write a java program that checks whether a given string is palindrome or not.

**Week 3:** a) Write a java program to represent Abstract class with example.

b) Write a java program to implement Interface using extends keyword.

**Week 4:** a) Write a java program to create user defined package.

**Week 5:** a) Write a java program to create inner classes.

- b) Write a java program for creating multiple catchblocks.
- c) Write a Java Program for creating User DefinedException.

**Week 6:** a) Write a java program for producer and consumer problem using Threads.

- b) Write a Java program that implements a multi-thread application that has three threads.

**Week 7:** a) Write a java program to implement all file operations.

- b) Write a Java Program to list all the files in a directory including the files present in all its sub directories.

**Week 8:** a) Write a java program to represent ArrayList class.

- b) Write a Java program loads phone no, name from a text file usingHashtable.

**Week 9:** a) Write an applet program that displays a simple message.

- b) Write a Java program compute factorial value using Applet.
- c) Write a program for passing parameters usingApplet.

**Week 10:** Write a java program for handling Mouse events and Key events

**Week 11:** Write a java program that works as a simple calculator. Use a Grid Layout arrange Buttons for digits and for the + - \* % operations. Add a text field to display the result.

#### **TEXT BOOK/ REFERENCE BOOKS:**

1. Java Fundamentals - A Comprehensive Introduction, HerbertSchildt and Dale Skrien,TMH.
2. Java for Programmers, P.J.Deitel and H.M.Deitel, PEA (or) Java:How to Program , P.J.Deitel andH.M.Deitel,PHI

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2000MC03) HUMAN VALUES AND PROFESSIONAL ETHICS

B.Tech. II Year I Sem

L T P C

2 0 0 0

### COURSE OBJECTIVES:

- To enable the students to imbibe and internalize the Values and Ethical Behaviour in the personal and Professional lives.

### Course Outcome:

- The students will understand the importance of Values and Ethics in their personal lives and professional careers. The students will learn the rights and responsibilities as an employee, team member and a global citizen.

### UNIT - I:

**Introduction to Human Values:** Need, basic Guidelines, Content and Process for Value Education, Self Exploration - 'Natural Acceptance' and Experiential Validation. Continuous Happiness and Prosperity - A look at basic Human Aspirations. Right understanding, Relationship and Physical Facilities. Understanding Happiness and Prosperity correctly

### UNIT - II:

**Understanding Harmony in the Family and Society:** Harmony in Human - Human Relationship: Understanding harmony in the Family the basic unit of human interaction. Understanding values in human - human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship. Understanding the harmony in the society (society being an extension of family). Visualizing a universal harmonious order in society - Undivided Society (AkhandSamaj), Universal Order (SarvabhaumVyawastha) - from family to worldfamily!

### UNIT - III:

**Introduction to Professional Ethics:** Basic Concepts, Governing Ethics, Personal & Professional Ethics, Ethical Dilemmas, Life Skills, Emotional Intelligence, Thoughts of Ethics, Value Education, Dimensions of Ethics, Profession and professionalism, Professional Associations, Professional Risks, Professional Accountabilities, Professional Success, Ethics and Profession.

### UNIT - IV:

Professional Practices in Engineering: Work Place Rights & Responsibilities, Professions and Norms of Professional Conduct, Norms of Professional Conduct vs. Profession; Responsibilities, Obligations and Moral Values in Professional Ethics, Professional codes of ethics, the limits of predictability and responsibilities of the engineering profession. Central Responsibilities of Engineers - The Centrality of Responsibilities of Professional Ethics; lessons from 1979 American Airlines DC-10 Crash and Kansas City Hyatt Regency Walk away Collapse.

### UNIT - V:

**Global issues in Professional Ethics:** Introduction - Current Scenario, Technology Globalization of MNCs, International Trade, World Summits, Issues, Business Ethics and Corporate Governance, Sustainable Development

Ecosystem, Energy Concerns, Ozone Depletion, Pollution, Ethics in Manufacturing and Marketing, Media Ethics, War Ethics, Bio Ethics, Intellectual Property Rights.

**TEXT BOOKS:**

1. R. R. Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.
2. Professional Ethics: R. Subramanian, Oxford University Press, 2015.
3. Ethics in Engineering Practice & Research, Caroline Whitbeck, 2e, Cambridge University Press 2015.

**REFERENCE BOOKS:**

1. Prof. K. V. Subba Raju, 2013, Success Secrets for Engineering Students, Smart Student Publications, 3rd Edition.
2. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
3. Engineering Ethics, Concepts Cases: Charles E Harris Jr., Michael S Pritchard, Michael J Rabins, 4e, Cengage Learning, 2015.
4. Business Ethics concepts & Cases: Manuel G Velasquez, 6e, PHI, 2008.

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2000HS03) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

B.Tech. II Year II Sem      L T P C  
3 0 0 3

### COURSE OBJECTIVES:

To enable the student to understand and appreciate, with a particular insight, the importance of certain basic issues governing the business operations namely; demand and supply, production function, cost analysis, markets, forms of business organizations, capital budgeting, financial accounting and financial analysis.

### Course Outcomes:

At the end of the course, the student will understand the market dynamics namely, demand and supply, demand forecasting, elasticity of demand and supply, pricing methods and pricing in different market structures, gain an insight into how production function is carried out to achieve least cost combination of inputs and cost analysis, develop an understanding of how capital budgeting decisions are carried out, understanding the framework for both manual and computerized accounting process, know how to analyze and interpret the financial statements through ratio analysis.

### UNIT I

**Introduction & Demand Analysis:** Definition, Nature and Scope of Managerial Economics. Demand Analysis: Demand Determinants, Law of Demand and its exceptions. Elasticity of Demand: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting.

### UNIT II

**Production & Cost Analysis:** Production Function - MRTS, Least Cost Combination of Inputs, Laws of Returns, Internal and External Economies of Scale. Cost Analysis: Cost concepts. Break-even Analysis (BEA)- Determination of Break-Even Point (simple problems) - Managerial Significance.

### UNIT III

**Markets & New Economic Environment:** Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition. Pricing: Objectives and Policies of Pricing. Methods of Pricing. Business: Features and evaluation of different forms of Business Organization: Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, New Economic Environment: Changing Business Environment in Post-liberalizations scenario.

### UNIT IV

**Capital Budgeting:** Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising capital - Capital Budget, Cash Budget. Capital Budgeting: features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of return (ARR) and Net Present Value Method (simple problems).

**UNIT V**

Introduction to Financial Accounting & Financial Analysis: Accounting concepts and Conventions - Double-Entry Book Keeping, Journal, Ledger, Trial Balance - Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). Financial Analysis: Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitabilityratios.

**TEXT BOOKS:**

1. Varshney &Maheswari: Managerial Economics, SultanChand,2009.
2. S.A. Siddiqui & A.S. Siddiqui, Managerial Economics and Financial Analysis, New Age international Publishers,Hyderabad2013.
3. M. Kasi Reddy & Saraswathi, Managerial Economics and Financial Analysis, PHI New Delhi,2012.

**REFERENCES:**

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi,2012.
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics,Pearson,2012.
3. Lipsey &Chrystel, Economics, Oxford UniversityPress,2012.
4. Domnick Salvatore: Managerial Economics In a Global Economy,Thomson,2012.
5. Narayanaswamy: Financial Accounting - A Managerial Perspective,Pearson,2012.
6. S.N. Maheswari& S.K. Maheswari, Financial Accounting, Vikas,2012.
7. Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley,2012.
8. Dwivedi: Managerial Economics,Vikas,2012.
9. Shailaja & Usha: MEFA, UniversityPress,2012.
10. Aryasri: Managerial Economics and Financial Analysis,TMH,2012.
11. Vijay Kumar &Appa Rao, Managerial Economics & Financial Analysis, Cengage2011.
12. J.V. Prabhakar Rao & P.V. Rao, Managerial Economics & Financial Analysis, Maruthi Publishers,2011.

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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (1805PC07) FORMAL LANGUAGES AND AUTOMATA THEORY

B.Tech. II Year II Sem

L T P C

3 0 0 3

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### OBJECTIVES:

The purpose of this course is to acquaint the student with an overview of the theoretical foundations of computer science from the perspective of formal languages.

- Classify machines by their power to recognize languages.
- Employ finite state machines to solve problems in computing.
- Explain deterministic and non-deterministic machines.
- Comprehend the hierarchy of problems arising in the computer sciences.

Outcomes:

- Graduate should be able to understand the concept of abstract machines and their power to recognize the languages.
- Attains the knowledge of language classes & grammars relationship among them with the help of Chomsky hierarchy.
- Graduate will be able to understanding the pre-requisites to the course compiler or advanced compiler design.

### UNIT - I

**Introduction to Finite Automata:** Structural Representations, Central Concepts of Automata Theory and its Applications. Deterministic Finite Automata, Nondeterministic Finite Automata, Finite Automata with Epsilon-Transitions. Moore and Mealy machine. Equivalence and minimization of FSM.

### UNIT - II

**Regular Expressions:** Finite Automata and Regular Expressions, Applications of Regular Expressions, Algebraic Laws for Regular Expressions, Pumping Lemma for Regular Languages, Applications of the Pumping Lemma, Closure Properties of Regular Language. Equivalence of FA and Regular expression.

### UNIT - III

**Context-Free Grammars:** Definition, Derivations Using a Grammar, Leftmost and Rightmost Derivations, the Language of a Grammar, Sentential Forms, Parse Trees, Minimization of Context-Free Grammar, Ambiguity in Grammars and Languages.

**Push Down Automata:** Construction of Pushdown Automaton, the Languages of a PDA, Equivalence of PDA's and CFG's, Deterministic Pushdown Automata.

### UNIT - IV

**Normal Forms for Context-Free Grammars:** Closure Properties of Context-Free Languages. Types of Normal Forms and its conversions.

Introduction to Turing Machines: Turing Machine, Programming Techniques for Turing Machines, Extensions to the basic Turing Machine, Restricted Turing Machines, Universal Turing Machine(UTM).

#### UNIT - V

**Undecidability:** A Language that is Not Recursively Enumerable, An Undecidable Problem That is RE, Undecidable Problems about Turing Machines, Post's Correspondence Problem, Intractable Problems: The Classes P and NP, NP- Complete Problem. Rice's Theorem.

#### TEXT BOOKS:

1. Introduction to Automata Theory, Languages, and Computation, 3rd Edition, John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, Pearson Education.
2. Introduction to the Theory of Computation, Michael Sipser, 3rd edition, CengageLearning.
3. Kamala Krithivasan and Rama R, Introduction to Formal Languages, Automata Theory and Computation, Pearson Education, 2009.

#### REFERENCE BOOKS:

1. Introduction to Languages and the Theory of Computation, John C Martin, TMH.
2. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
3. A Text book on Automata Theory, P. K. Srimani, Nasir S. F. B, Cambridge University.



# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2066PC01) ARTIFICIAL INTELLIGENCE

B.Tech. II Year II Sem

L T P C

3 0 0 3

**OBJECTIVES:**

- Introduce and define the meaning of Intelligence and explore various paradigms for knowledge encoding in computer systems.
- Introduce subfields of AI such as NLP, Game Playing, Bayesian Models, etc.

**COURSE OUTCOMES:**

Students will be able to

1. Identify problems where artificial intelligence techniques are applicable.
2. Understand the relation between AI & various domains.
3. Apply selected basic AI techniques; judge applicability of more advanced techniques.
4. Participate in the design of systems that act intelligently and learn from experience.

**UNIT I**

Introduction to AI: Introduction to Artificial Intelligence, History of AI, Logic and Computation, Artificial Intelligence Languages, Multi Agent Systems

**UNIT II**

State Space Search and Heuristic Search Techniques:

Defining problems as State Space search, Production systems and characteristics, Hill Climbing, Breadth first and depth first search, Best first search.

**UNIT III**

**Knowledge Representation and Reasoning :** Representations and Mappings, Approaches to knowledge representation, Representing simple facts in logic, Computable functions and predicates, Procedural vs Declarative knowledge, Logic Programming, Forward vs backward reasoning

**UNIT IV**

**Symbolic Logic and Statistical Reasoning**

Symbolic Logic: Non-monotonic Reasoning, Logics for non-monotonic reasoning Statistical Reasoning: Probability and Bayes Theorem, Certainty factors, Probabilistic Graphical Models, Bayesian Networks, Markov Networks, Fuzzy Logic.

**UNIT V**

**Important Applications:** Introduction to Natural Language Processing, Hopfield Networks, Neural Networks, Recurrent Networks, Symbolic AI

**NEW TEXT BOOKS:**

1. Artificial Intelligence' R B Mishra, PHI
2. Artificial Intelligence: A Modern Approach, Stuart Russel, Peter Norvig
3. Artificial Intelligence, 2nd Edition, Rich and Knight

**REFERENCE BOOKS**

1. Artificial Intelligence: A Modern Approach, Stuart Russel, Peter Norvig
2. Artificial Intelligence, 2nd Edition, Rich and Knight

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2005PC10) DESIGN AND ANALYSIS OF ALGORITHMS

B.Tech. III Year II Sem

L T P C

3 0 0 3

**OBJECTIVES:**

- To analyze performance of algorithms.
- To choose the appropriate data structure and algorithm design method for a specified application.?
- To understand how the choice of data structures and algorithm design methods impacts the performance of programs.
- To solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking and branch and bound.?
- Prerequisites (Subjects) Data structures, Mathematical foundations of computer science.?

**Course Outcomes:**

- Be able to analyze algorithms and improve the efficiency of algorithms.?
- Apply different designing methods for development of algorithms to realistic problems, such as divide and conquer, greedy and etc. Ability to understand and estimate the performance of algorithm.?

**UNIT - I**

**Introduction**-Algorithm definition, Algorithm Specification, Performance Analysis-Space complexity, Time complexity, probabilistic analysis Randomized Algorithms.

**Divide and conquer**- General method, applications - Binary search, Merge sort, Quick sort, Strassen's Matrix Multiplication.

**UNIT - II**

**Disjoint set operations**- union and find algorithms, Efficient non-recursive binary tree traversal algorithms, spanning trees, graph traversals- BFS and DFS, AND/OR graphs, Game Tree, Connected Components and Spanning trees, Bi-connected components

**UNIT - III**

**Greedy method**- General method, applications- Knapsack problem, Job sequencing with deadlines, Minimum cost spanning trees, Single source shortest path problem.

**Dynamic Programming**- General Method, applications- All pairs shortest path problem, Optimal binary search trees, 0/1 knapsack problem, Reliability design, Traveling sales person problem.

**UNIT - IV**

Backtracking-General method, applications-The 8-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

**Branch and Bound**- General Method, applications-0/1 Knapsack problem, LC Branch and Bound solution, traveling sales person problem.

#### **UNIT - V**

NP- Hard and NP-Complete problems- Basic concepts, Non-deterministic algorithms, NP - Hard and NP-Complete classes, Cook's theorem.

#### **TEXT BOOKS:**

1. Fundamentals of Computer Algorithms, 2nd Edition, Ellis Horowitz, Sartaj Sahni and S. Raja sekharan, Universities Press.
2. Design and Analysis of Algorithms, P. H. Dave, H. B. Dave, 2nd edition, Pearson Education.

#### **REFERENCE BOOKS:**

1. Algorithm Design: Foundations, Analysis and Internet examples, M. T. Goodrich and R. Tomassia, John Wiley and sons.
2. Design and Analysis of Algorithms, S. Sridhar, Oxford Univ. Press
3. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson Education.
4. Foundations of Algorithms,, R. Neapolitan and K. Naimipour, 4th edition, Jones and Bartlett Student edition.
5. Introduction to Algorithms, 3rd Edition, T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, PHI

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2005ES03) COMPUTER ORGANIZATION AND OPERATING SYSTEMS

B.Tech. II Year II Sem

L T P C

3 0 0 3

### COURSE OBJECTIVES:

The main objectives of the course are:

1. To have a thorough understanding of the basic structure and operation of a digital computer.
2. To discuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division.
3. To study the different ways of communicating with I/O devices and standard I/O interfaces.
4. To study the hierarchical memory system including cache memories and virtual memory.
5. To demonstrate the knowledge of functions of operating system memory management scheduling, file system and interface, distributed systems, security and deadlocks.
6. To implement a significant portion of an Operating System.

### COURSE OUTCOMES:

1. Basic structure of a digital computer
2. Arithmetic operations of binary number system
3. The organization of the Control Unit, Arithmetic and Logical Unit, Memory Unit and the I/O unit.
4. Operating system functions, types, system calls.
5. Memory management techniques and dead lock avoidance
6. Operating system files system and implementation and its interface.

### UNIT - I:

**Basic Structure of Computers:** Computer Types, Functional UNIT, Basic Operational Concepts, Bus, Structures, Software, Performance, Multiprocessors and Multi Computers, Data Representation, Fixed Point Representation, Floating - Point Representation.

**Register Transfer Language and Micro Operations:** Register Transfer Language, Register Transfer Bus and Memory Transfers, Arithmetic Micro Operations, Logic Micro Operations, Shift Micro Operations, Arithmetic Logic Shift Unit, Instruction Codes, Computer Registers Computer Instructions - Instruction Cycle. Memory - Reference Instructions, Input - Output and Interrupt, STACK Organization, Instruction Formats, Addressing Modes, DATA Transfer and Manipulation, Program Control, Reduced Instruction Set Computer.

### UNIT - II:

**Micro Programmed Control:** Control Memory, Address Sequencing, Micro program Examples, Design of Control Unit, Hard Wired Control, Micro programmed Control.

**The Memory System:** Basic Concepts of Semiconductor RAM Memories, Read-Only Memories, Cache Memories Performance Considerations, Virtual Memories secondary Storage, Introduction to RAID.

**UNIT - III:**

**Input-Output Organization:** Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer Modes, Priority Interrupt, Direct Memory Access, Input-Output Processor (IOP), Serial Communication; Introduction to Peripheral Components, Interconnect (PCI) Bus, Introduction to Standard Serial Communication Protocols like RS232, USB, IEEE1394.

**UNIT - IV:**

**Operating Systems Overview:** Overview of Computer Operating Systems Functions, Operating Systems Structures- Systems Calls, System Programs Process Management: Process, Process States, Process Control Block, CPU Scheduling Algorithms

**Memory Management:** Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation, Virtual Memory, Demand Paging, Page-Replacement Algorithms, Allocation of Frames, Thrashing

**UNIT - V:**

**Principles of Deadlock:** System Model, Deadlock Characterization, Deadlock Prevention, Detection and Avoidance, Recovery from Deadlock.

**File System Interface:** The Concept of a File, Access Methods, Directory Structure, File System Mounting, File Sharing, Protection.

**TEXT BOOKS:**

1. Computer Organization - Carl Hamacher, ZvonksVranesic, SafeaZaky, 5th Edition, McGraw Hill.
2. Computer System Architecture - M.Moris Mano, 3rd edition, Pearson

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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2005PC08) DATABASE MANAGEMENT SYSTEMS

B.Tech. II Year II Sem

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### COURSE OBJECTIVES:

- To understand the basic concepts and the applications of databasesystems.
- To master the basics of SQL and construct queries usingSQL.
- To understand the relational database designprinciples.
- To become familiar with the basic issues of transaction processing and concurrencycontrol.
- To become familiar with database storage structures and accesstechniques.

### Course Outcomes:

Demonstrate the basic elements of a relational database management system and Ability to identify the data models for relevantproblems.

Ability to design entity relationship model and convert entity relationship diagrams into RDBMS and formulate SQL queries on thedata.

Apply normalization for the development of applicationssoftware.

### UNIT - I :

**Introduction:** Database System Applications, Purpose of Database Systems, View of Data, Database Languages - DDL, DML, Relational Databases, Database Design, Database Architecture, Data Mining and Information Retrieval, Database Users and Administrators, History of Database Systems.

Introduction to Data base design: Database Design and ER diagrams, Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ER Model, Conceptual Design with the ER Model, Conceptual Design for Large enterprises.

### UNIT - II :

**Relational Model:** Introduction to the Relational Model, Integrity Constraints over Relations, Enforcing Integrity constraints, Querying relational data, Logical data base Design: ER to Relational, Introduction to Views, Destroying /Altering Tables and Views.

Relational Algebra and Calculus: Preliminaries, Relational Algebra, Relational calculus- Tuple relational Calculus, Domain relational calculus.

### UNIT - III:

**SQL:** Queries, Constraints, Triggers: Form of Basic SQL Query, UNION, INTERSECT, and EXCEPT, Nested Queries, Aggregate Operators, NULL values, Natural JOINS, Complex Integrity Constraints in SQL, Triggers and Active Data bases..

**Schema Refinement and Normal Forms:** Introduction to Schema Refinement, Functional Dependencies - Reasoning about FDs, Normal Forms, Properties of Decompositions, Normalization, Schema Refinement in Database Design, Other Kinds of Dependencies.

#### UNIT - IV:

**Transaction Management:** Transactions, Transaction Concept, A Simple Transaction Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability.

**Concurrency Control:** Lock-Based Protocols, Multiple Granularity, Timestamp-Based Protocols, Validation-Based Protocols.

**Recovery System-** Failure Classification, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with loss of nonvolatile storage, Remote Backup systems.

#### UNIT - V:

**Storage and Indexing:** Overview of Storage and Indexing: Data on External Storage, File Organization and Indexing, Index Data Structures, Comparison of File Organizations. **Tree-Structured Indexing:** Intuition for tree Indexes, Indexed Sequential Access Method (ISAM), B+ Trees: A Dynamic Index Structure, Search, Insert, Delete.

#### TEXT BOOKS:

1. Data base Management Systems, Raghu Ramakrishnan, Johannes Gehrke, McGraw Hill Education (India) Private Limited, 3rd Edition. (Part of UNIT-I, UNIT-II, UNIT-III, UNIT- V)
2. Data base System Concepts, A. Silberschatz, Henry. F. Korth, S. Sudarshan, McGraw Hill Education (India) Private Limited 1, 6th edition. ( Part of UNIT-I, UNIT-IV)

#### REFERENCE BOOKS:

2. Database Systems, 6th edition, R Elmasri, Shamkant B. Navathe, Pearson Education.
3. Database System Concepts, Peter Rob & Carlos Coronel, Cengage Learning.
4. Introduction to Database Management, M. L. Gillenson and others, Wiley Student Edition.
5. 4. Database Development and Management, Lee Chao, Auerbach publications, Taylor & Francis Group. Introduction to Database Systems, C. J. Date, Pearson Education.



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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## ARTIFICIAL INTELLIGENCE LAB

B.Tech. II Year II Sem

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### COURSE OBJECTIVES:

1. Provide a broad understanding of the basic techniques for building intelligent computer systems and an understanding of how AI is applied to problems.
2. Gain knowledge in problem formulation and building intelligent agents
3. Understand the search technique procedures applied to real world problems
4. Understand the types of logic and knowledge representation schemes
5. Acquire knowledge in planning and learning algorithms

### COURSE OUTCOMES:

Students will be able to

1. Formulate a problem and build intelligent agents.
2. Apply appropriate searching techniques to solve a real world problem
3. Analyze the problem and infer new knowledge using suitable knowledge representation schemes
4. Develop planning and apply learning algorithms on real world problems
5. Design an expert system and implement natural language processing techniques.

### List of experiments:

- 1 Study of facts, objects, predicates and variables in PROLOG.
- 2 Study of Rules and Unification in PROLOG.
- 3 Study of "cut" and "fail" predicate in PROLOG.
- 4 Study of arithmetic operators, simple input/output and compound goals in PROLOG.
- 5 Study of recursion in PROLOG.
- 6 Study of Lists in PROLOG.
- 7 Study of dynamic database in PROLOG.
- 8 Study of string operations in PROLOG. Implement string operations like
- 9 substring, string position, palindrome etc.)
- 10 Write a prolog program to maintain family tree.
- 11 Write a prolog program to implement all set operations (Union, intersection, complement etc.)

- 12 Write a prolog program to implement Library Managementsystem.
- 13 Write a prolog program to solve "Water JugProblem".

**TEXT BOOKS:**

1. Artificial Intelligence' R B Mishra, PHI
2. Knowledge and Knowledge based system'Russell
3. Introduction to Artificial Intelligence, CHARNIAK, PEARSON
4. Artificial Intelligence, Stuard Russell & Peter Norvig, Prentice
5. Introduction to Turbo PROLOG, Carl Townsend, BPB Publication.

**REFERENCES:**

1. Artificial Intelligence: Elaine Rich, Kevin Knight, Mc-GrawHill.
2. Introduction to AI & Expert System: Dan W. Patterson, PHI.
3. Artificial Intelligence by Luger (Pearson Education)
4. Russel & Norvig, Artificial Intelligence: A Modern Approach, Pearson Education

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2005PC64) DATABASE MANAGEMENT SYSTEMS LAB

B.Tech. II Year II Sem

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### STUDENTS WILL HAVE THE ABILITY TO:

- Keep abreast of current developments to continue their own professional development.
- To engage themselves in lifelong learning of Database management systems theories and technologies this enables them to pursue higher studies.
- To interact professionally with colleagues or clients located abroad and the ability to overcome challenges that arises from geographic distance, cultural differences, and multiple languages in the context of computing.
- Develop team spirit, effective work habits, and professional attitude in written and oral forms, towards the development of database applications

### Course Outcomes:

Students will be able to demonstrate their skills

- In drawing the ER, EER, and UML Diagrams.
- In analyzing the business requirements and producing a viable model for the implementation of the database.
- In converting the entity-relationship diagrams into relational tables.
- To develop appropriate Databases to a given problem that integrates ethical, social, legal, and economic concerns.

A. Practice on SQL Queries to acquire knowledge on RDBMS.

B. Case Study:

**Objective:** This lab enables the students to practice the concepts learnt in the subject DBMS by developing a database for an example company named "Roadway Travels" whose description is as follows. The student is expected to practice the designing, developing and querying a database in the context of example database "Roadway travels". Students are expected to use "Mysql" database.

Roadway Travels: "Roadway Travels" is in business since 1997 with several buses connecting different places in India. Its main office is located in Hyderabad.

The company wants to computerize its operations in the following areas:

- Reservations and Ticketing
- Cancellations Reservations & Cancellation:

Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger. One Passenger / person can book many tickets (to his/her family).

Cancellations are also directly handed at the booking office.

In the process of computerization of Roadway Travels you have to design and develop a Database which

consists the data of Buses, Passengers, Tickets, and Reservation and cancellation details. You should also develop query's using SQL to retrieve the data from the database.

The above Process involves many steps like

1. Analyzing the problem and identifying the Entities and Relationships, 2. E?R Model, 3. Relational Model 4. Normalization 5. Creating the database 6. Querying. Students are supposed to work on these steps week wise and finally create a complete "Database System" to Roadway Travels. Examples are given at every experiment for guidance to students.

### Experiment 1: E-R Model

Analyze the problem carefully and come up with the entities in it using software design tool. Identify what data has to be persisted in the database. This contains the entities, attributes etc.

Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.

Example:

#### Entities:

1. BUS
2. Ticket
3. Passenger

#### Relationships:

1. Reservation
2. Cancellation

#### PRIMARY KEY ATTRIBUTES:

1. Ticket ID (TicketEntity)
2. Passport ID(PassengerEntity)
3. Bus\_NO(BusEntity)

Apart from the above mentioned entities you can identify more. The above mentioned are few.

Ex: Bus Entity

Ex: Reservation relationship

Note: The student is required to submit a document by writing the Entities and Keys to the lab teacher

### Experiment 2: Installation of Mysql and practicing DDL, commands

Installation of MySQL. In this week you will learn Creating databases, How to create tables, altering the database, dropping tables and databases if not required. You will also try truncate, rename commands etc.

Example for creation of a normalized "Passenger" table.

```
CREATE TABLE Passenger ( Passport_id INTEGER PRIMARY KEY, Name VARCHAR(50)
NotNULL,
Age Integer Not NULL, Sex Char,
```

Address VARCHAR (50) Not NULL);

Similarly create all other tables.

Note: Detailed creation of tables is given at the end. Experiment 3: Practicing DML commands

DML commands are used to for managing data within schema objects. Some examples:

- SELECT - retrieve data from the adatabase
- INSERT - insert data into atable
- UPDATE - updates existing data within atableDELETE?deletes all records from a table, the space for the recordsremain

#### Inserting values into "Bus" table:

Insert into Bus values (1234,'hyderabad', 'tirupathi');

Insert into Bus values (2345,'hyderabd' 'Banglore');

Insert into Bus values (23,'hyderabd','Kolkata');

Insert into Bus values (45,'Tirupathi,'Banglore');

Insert into Bus values (34,'hyderabd','Chennai');

#### Inserting values into "Passenger" table:

Insert into Passenger values (1, 45,'ramesh', 45,'M','abc123');

Insert into Passenger values (2, 78,'geetha', 36,'F','abc124');

Insert into Passenger values (45, 90,' ram', 30,'M','abc12');

Insert into Passenger values (67, 89,' ravi', 50,'M','abc14');

Insert into Passenger values (56, 22,'seetha', 32,'F','abc55');

#### Few more Examples of DMLcommands:

Select \* from Bus; (selects all the attributes and display)

UPDATE BUS SET Bus No = 1 WHERE BUS NO=2;

#### Experiment 4: Querying

In this week you are going to practice queries(along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

#### Practice the following Queries

Display unique PNR\_no of all Passengers. Display all the names of male passengers. Display the ticket numbers and names of all the passengers.

Find the ticket numbers of the passengers whose name start with 'r' and ends with 'h'. Find the names of passengers whose age is between 30 and 45.

Display all the passengers names beginning with 'A' Display the sorted list of passengers names

#### Experiment 5:

**Aggregate Functions and Number Functions, Nested Query and Co-related Queries:** You are going

to practice queries using Aggregate functions and number functions(COUNT, SUM, AVG, and MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

Write a Query to display the Information present in the Passenger and cancellation tables. Hint: Use UNION Operator.

Display the number of days in a week on which the 9W01 bus is available.

Find number of tickets booked for each PNR\_no using GROUP BY CLAUSE. Hint: Use GROUP BY on PNR\_No.Find the distinct PNR numbers that are present.

Find the number of tickets booked by a passenger where the number of seats is greater than 1.Hint: Use GROUP BY, WHERE and HAVINGCLAUSES.

Find the total number of cancelled seats.

### **Nested Query and Co-related Queries**

Use the tables sailors, reserves, boats for implementing the following Sailors (sid: integer, sname: string, rating: integer, age: real);

- Boats (bid: integer, bname: string, color: string); Reserves(sid: integer, bid: integer, day: date).
- Find the names of sailors who have reservedboat103
- Find the name and the age of the youngestsailor
- Find the names and ratings of sailor whose rating is better than some sailor called Horatio
- Find the names of sailors who have reserved allboats

### **Experiment 6: VIEWS and JOIN**

In this week, we are going to implement views and also perform various operations like alter, update and delete commands.

#### **View:**

Write a query to execute and verify the SQL commands using Views (Use Employee Table)

- (a) Alter (b) Update (c) Delete

#### **Join:**

Write a query to execute and verify the SQL commands using Join (Use Customer Table)

- (a) Inner join, (b). Left join, (c). Right join (d). Full join

### **Experiment 7: Triggers**

In this week you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.

```
Eg: CREATE TRIGGER up d check BEFORE UPDATE ON passenger FOR EACH ROW BEGIN
IF NEW.Tickent NO > 60 THEN SET
New.Tickent no = Ticket no; ELSE SET
New.Ticket no = 0; END IF;
```

END;

### Experiment 8: Procedures

In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database.

Eg: CREATE PROCEDURE myProc()BEGIN

SELECT COUNT(Tickets) FROM Ticket WHERE age>=40; End;

### Experiment 9: Cursors

In this week you need to do the following: Declare a cursor that defines a result set.

Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done.

```
CREATE PROCEDURE myProc (in_customer_id INT) BEGIN DECLARE v_id INT; DECLARE
v_nameVARCHAR(30);
```

```
DECLAREc1CURSORFORSELECTppno,nameFROMPassengerWHERE ppno=in_customer_id; OPENc1;
FETCH c1
```

```
into v_id, v_name; Close c1; END Tables BUS
```

#### Bus No: Varchar:

PK (Primary key) Source: Varchar Destination:

Varchar DeptTime:Varchar Passenger

PPNO: Varchar(15)) :

#### PK Name:

Varchar(15) Age : int (4) Sex:Char( I 0) : Male/Female Address: VarChar(20)

Passenger\_Tickets

PPNO: Varchar( 15)) : FK Ticket No: Numeric (9)

#### Reservation

##### PNR\_No: Numeric(9) :

PK Journey\_date: datetime(8) No\_of\_seats : int (8) Address: Varchar(50) Contact\_No: Numeric (9) -> Should not be less than 9 and Should not accept any other character other than Integer Status: Char (2) : Yes / No

#### Cancellation

PNR\_No:Numeric(9):

FK Journey\_date:datetime (8) No\_of\_seats : int (8) Address : Varchar (50)

Contact\_No: Numeric (9) -> Should not be less than 9 and should not accept any other character other than Integer

Status: Char (2) : Yes / No

#### Ticket

Ticket\_No: Numeric(9):

PK Journey\_date :datetime(8) Age : int (4)

Sex:Char(10) :Male/Female

Source :Varchar Destination :Varchar Dep\_time :Varchar

### Experiment 10: Normalization

Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies. For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity. A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.

For the above table in the First normalization we can remove the multi valued attribute Ticket\_id and place it in another table along with the primary key of passenger.

**First Normal Form: The above table can be divided into two tables as shown below.**

Passenger				
Name	Age	Sex	Address	<u>PassportID</u>

  

<u>Passport id</u>	<u>Ticket id</u>
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You can do these cond and third normal forms if required. And how Normalize dtables are given at the end.

### Experiment 11: PL/SQL Programs

In this week, you are going to learn and work on PL/SQL procedures.

- Write a PL/SQL procedure to find the average of marks?
- Write a PL/SQL procedure to find the factorial of a number?
- Write a PL/SQL code to calculate tax for an employee of an organization-XYZ and to display his/her name & tax, by creating table under employee database as below. Employee\_salary Emp\_no Basic HRA DA Total\_deduction Net\_salary Gross\_salary

### Experiment 12: Revoke/Grant/Commit/Rollback

In this week, you need to do the following: Declare a table that defines a result set using revoke, grant, save



point, commit, rollback operations

Consider the following tables namely "DEPARTMENTS" and "EMPLOYEES" Their schemas are as follows, Departments ( dept\_no , dept\_name , dept\_location ); Employees ( emp\_id , emp\_name , emp\_salary );

1. Develop a query to grant all privileges of employee table to department table
2. Develop a query to grant some privileges of employee table to department table
3. Develop a query to revoke all privileges of employee table from department table
4. Develop a query to revoke some privileges of employees table from department table
5. Write a query to implement the savepoint
6. Write a query to implement the commit
7. Write a query to implement roll back

### REFERENCE BOOKS:

1. Introduction to SQL, Rick F. Vander Lans, Pearson Education..
2. Oracle PL/SQL, B. Rosenzweig and E. Silvestrova, Pearson Education.
3. Oracle PL/SQL Programming, Steven Feuerstein, SPD.
4. SQL & PL/SQL for Oracle 10g, Black Book, Dr. P.S. Deshpande, DreamTech
5. Oracle Database 11g PL/SQL Programming, M. McLaughlin, TMH
6. SQL Fundamentals, J.J. Patrick, Pearson Education

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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2000MC04) INDIAN CONSTITUTION

B.Tech. II Year II Sem

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### COURSE OBJECTIVE:

- To enable the students to be aware of emergence and evolution of Indian Constitution, to understand their fundamental rights and duties and to understand the structure and composition of Election Commission.

### Course Outcome:

- Students will be able to understand and discuss about Indian constitution. The students will learn their Rights and Responsibilities as an Indian citizen.

### UNIT - I

- Meaning and Importance of Constitution, Evolution of the constitution of India. Salient features of the constitution of India

### UNIT - II

Scheme of fundamental rights, fundamental duties and its legal status. The Directive Principles of State Policy- Significance and implementation

### UNIT - III

Government of the Union : President of India - Election and Powers, Prime Minister and Council of Ministers, Lok Sabha - Composition and Powers, Rajya Sabha - Composition and Powers

### UNIT - IV

The historical perspectives of the constitutional amendments in India. Emergency provisions: National Emergency, President Rule, Financial Emergency, Local self-government- Constitutional scheme in India

### UNIT - V

Election Commission: Role and Functioning, Chief Election Commissioner and Election Commissioners, State Election Commission: Role and Functioning, Institute and Bodies for the welfare of SC/ST/OBC and women.

### TEXTBOOKS:

- The Constitution of India, 1950 (Bare Act), Government Publication.
- M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.

### REFERENCES:

- D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2012PC01) DATAWARE HOUSE AND DATAMINING

B.Tech. III Year II Sem

L T P C

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### COURSE OBJECTIVES:

- Study data warehouse principles and its working learn data mining concepts.
- To understand association rules mining.
- Discuss classification algorithms.
- Learn how data is grouped using clustering techniques.

### Course Outcomes:

- Students should be able to understand why the data warehouse in addition to database systems.
- Ability to perform the pre-processing of data and apply mining techniques on it.
- Ability to identify the association rules, classification and clusters in large datasets.
- Ability to solve real world problems in business and scientific information using data mining

### UNIT-I

Data Warehouse: Introduction to Data warehouse, Difference between operational database systems and data warehouses, Datawarehouse Characteristics, Datawarehouse Architecture and its Components, Extraction-Transformation-Loading, Logical(Multi- Dimensional), Data Modeling, Schema Design, Star and Snow-Flake Schema, Fact Constellation, Fact Table, Fully Addictive, Semi-Addictive, NonAddictive Measures; Fact-Less-Facts, Dimension Table Characteristics; OLAP Cube, OLAP Operations, OLAP Server Architecture-ROLAP, MOLAP and HOLAP.

### UNIT-II

**Introduction:** Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or Data Warehouse System, Major issues in Data Mining.

**Data Preprocessing:** Need for Preprocessing the Data, Data Cleaning, Data Integration & Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

### UNIT-III

**Association Rules:** Problem Definition, Frequent Item Set Generation, The APRIORI Principle, Support and Confidence Measures, Association Rule Generation; APRIORI Algorithm, The Partition Algorithms, FP-Growth Algorithms, Compact Representation of Frequent Item Set- Maximal Frequent Item Set, Closed Frequent Item Set.

### UNIT-IV

**Classification:** Problem Definition, General Approaches to solving a classification problem, Evaluation of Classifiers,

Classification techniques, Decision Trees-Decision tree Construction, Methods for Expressing but the best conditions, Measures for Selecting the Best Split, Algorithm for Decision tree Induction; Naive-Bayes Classifier, Bayesian Belief Networks; K-Nearest neighbor classification - Algorithm and Characteristics.

**Prediction:** Accuracy and Error measures. Evaluating the accuracy of a Classifier or a Predictor, Ensemble Methods.

#### UNIT-V

**Cluster Analysis:** Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, and Model based Clustering Methods, Outlier Analysis.

#### TEXTBOOKS:

- 1) Data Mining- Concepts and Techniques- Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, 2nd Edition, 2006.
- 2) Introduction to Data Mining, Pang-Ning Tan, Vipin Kumar, Michael Steinbach, Pearson Education.

#### REFERENCE BOOKS:

- 1) Data Mining Techniques, Arun K Pujari, 3rd Edition, Universities Press.
- 2) Data Warehousing Fundamentals, Pualraj Ponnaiah, Wiley Student Edition.
- 3) The Data Warehouse Life Cycle Toolkit - Ralph Kimball, Wiley Student Edition.
- 4) Data Mining, Vikram Pudi, Pradha Krishna, Oxford University Press

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2005PC09) COMPILER DESIGN

B.Tech. III Year II Sem

L T P C

3 0 0 3

### COURSE OBJECTIVES:

- To provide an initial Understanding of language translators, Knowledge of various techniques used in compiler construction and also use of the automated tools available in compilers construction.

### Course Outcomes:

By the end of the semester, the student will be able to:

- Understand the necessity and types of different language translators in use.
- Apply the techniques and design different components (phases) of a compiler by hand.
- Solve problems, Write Algorithms, Programs and test them for the results.
- Use the tools Lex, Yacc in compiler construction.

### UNIT-I:

**Language Translation:** Basics, Necessity, Steps involved in a typical language processing system, Types of translators, Compilers: Overview and Phases of a Compiler, Pass and Phases of translation, boot strapping, data structures in compilation

**Lexical Analysis (Scanning):** Functions of Lexical Analyzer, Specification of tokens: Regular expressions and Regular grammars for common PL constructs. Recognition of Tokens: Finite Automata in recognition and generation of tokens. Scanner generators: LEX-Lexical Analyzer Generators.

### UNIT-II:

**Syntax Analysis (Parsing):** Functions of a parser, Classification of parsers. Context free grammars in syntax specification,

**Top down parsing-** Definition, types of top down parsers: Backtracking, Recursive descent, Predictive, LL (1), Preprocessing the grammars to be used in top down parsing, Error recovery, and Limitations. Bottom up parsing: Definition, types of bottom up parsing, Handle pruning. Shift Reduce parsing, LR parsers: LR(0), SLR, CALR and LALR parsing, Error recovery, Handling ambiguous grammar, Parser generators: YACC-yet another compiler.

### UNIT-III:

**Semantic analysis:** Attributed grammars, Syntax directed definition and Translation schemes, Type checker: functions, type expressions, type systems, types checking of various constructs. Intermediate Code Generation: Functions, different intermediate code forms- syntax tree, DAG, Polish notation, and Three address codes. Translation of different source language constructs into intermediate code.

### UNIT-IV:

**Runtime Environment:** Introduction, Activation Trees, Activation Records, Control stacks.

**Run time storage organization:** Static, Stack and Heap storage allocation. Storage allocation for arrays, strings, and records etc.

**Code optimization:** goals and Considerations for Optimization,

**Scope of Optimization:** Local optimizations, DAGs, Loop optimization, Global Optimizations. Common optimization techniques: Folding, Copy propagation, Common Sub expression eliminations, Codemotion, Frequency reduction, Strength reduction etc.

#### **UNIT-V:**

**Control flow and Data flow analysis:** Flow graphs, Data flow equations, global optimization: Redundant sub expression elimination, Induction variable eliminations, Live Variable analysis. Object code generation: Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.

#### **TEXTBOOKS:**

1. Compilers, Principle, Techniques, and Tools Alfred. VAho, Monca S.Lam, Ravi-Sethi, Jeffrey D.Ullman; 2nd Edition, Pearson Education.
2. Modern Compiler implementation in C, - Andrew N.Appel Cambridge University-Press.

#### **REFERENCES:**

1. lex & yacc, - JohnRLevine, TonyMason, DougBrown; O'reilly.
2. CompilerConstruction, -LOUDEN, Thomson.
3. Engineeringacompiler-Cooper & Linda, Elsevier
4. ModernCompilerDesign-DickGrune, HenryE.Bal, CarielTHJacobs, WileyDreatch.

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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2005PC05) SOFTWARE ENGINEERING

B.Tech. III Year I Sem

L T P C

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### COURSE OBJECTIVES:

- To comprehend the various software process models.
- To understand the types of software requirements and SRS document.
- To know the different software design and architectural styles.
- To learn the software testing approaches and metrics used in software development.
- To know about quality control and risk management.

### Course Outcomes:

At the end of the course the students are able to:

- To compare and select a process model for a business system.
- To identify and specify the requirements for the development of an application.
- To develop and maintain efficient, reliable and cost-effective software solutions.
- To critically think and evaluate assumptions and arguments of the client.

### UNIT-I:

**Introduction to Software Engineering:** The evolving role of software, Changing Nature of Software, Software myths.

**A Generic view of process:** A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

**Process models:** The waterfall model, Incremental process models, Evolutionary process models, The Unified process, Agility and Agile Process models of Agile Development and Tools

### UNIT-II:

**Software Requirements:** Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document (IEEE FORMAT) and its contents.

**Requirements engineering process:** Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

**System models:** Context Models, Behavioral models, Data models, Object models, structured methods. UML Diagrams.

### UNIT- III:

**Design Engineering:** Design process and Design quality, Design concepts, the design model.

**Creating an architectural design:** Software architecture, Data design, Architectural styles and patterns, Architectural Design.

**Object-Oriented Design:** Objects and object classes, An Object-Oriented design process, Design evolution.

**Performing User interface design:** Golden rules, User interface analysis and design, interface analysis, interface design steps.

#### UNIT-IV:

**Testing Strategies:** A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

**Product metrics:** Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

**Metrics for Process and Products:** Software Measurement, Metrics for software quality.

#### UNIT-V:

**Risk management:** Reactive vs. Pro active Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMMPlan.

**Quality Management:** Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards

#### TEXTBOOKS:

1. Software Engineering A Practitioner's Approach, Roger S Pressman, 6th edition. McGraw Hill International Edition.
2. Software Engineering, Ian Sommerville, 7th edition, Pearson education.

#### REFERENCE BOOKS:

1. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
2. Software Engineering: A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008
3. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
4. Software Engineering 1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.
5. Software Engineering 2: Specification of systems and languages, Diner Bjorner, Springer International edition 2006.
6. Software Engineering Principles and Practice, Hans Van Vliet, 3rd edition, John Wiley & Sons Ltd.
7. Software Engineering 3: Domains, Requirements, and Software Design, D. Bjorner, Springer International Edition.



# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## (2005PC11) COMPUTER NETWORKS

B.Tech. III Year I Sem

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### COURSE OBJECTIVES:

- To introduce the fundamental various types of computer networks.
- To demonstrate the TCP/IP and OSI models with merits and demerits.
- To explore the various layers of OSI Model.
- To introduce UDP and TCP Models.
- To introduce Encryption Security Mechanism

### Course Outcomes:

Students should be able to understand and explore the basics of Computer Networks and various Protocols. She will be in a position to understand and the World Wide Web concepts.

Students will be in a position to administer a network and flow of information further-he/she can understand easily the concepts of network security, Mobile and Adhoc networks.

### UNIT-I

**Data Communications:** Components - Direction of Data flow - Networks - Components and Categories - Types of Connections - Topologies - Protocols and Standards - ISO / OSI model, Physical layer: Transmission modes, Multiplexing, Transmission Media, Switching, Circuit Switched Networks, Datagram Networks and Virtual Circuit Networks.

### UNIT - II

**Data link layer:** Introduction, Framing, and Error - Detection and Correction - Parity - LRC - CRC Hamming code, Flow and Error Control, Noiseless Channels, Noisy Channels, HDLC, Point to Point Protocols. 111 Medium  
**Access sub layer:** ALOHA, CSMA/CD, LAN-Ethernet IEEE802.3, IEEE802.5-IEEE802.11, Random access, Controlled access

### UNIT - III

**Network layer:** Logical Addressing, Internetworking, Tunneling, Address mapping, ICMP, IGMP, Forwarding, Uni-Cast Routing Protocols, Multicast Routing Protocols.

### UNIT - IV

**Transport Layer:** Process to Process Delivery, UDP and TCP protocols, Data Traffic, Congestion, Congestion Control, QoS, Integrated Services, Differentiated Services, QoS in Switched Networks.

### UNIT-V

**Application Layer:** Domain name space, DNS in internet, electronic mail, SMTP, FTP, WWW, HTTP, SNMP, Security-PGP-SSH

**TEXTBOOKS:**

1. Data Communications and Networking, Behrouz A. Forouzan, Fourth Edition TMH, 2006.
2. Computer Networks, Andrew S. Tanenbaum, 4th Edition. Pearson Education, PHI.

**REFERENCES:**

1. Data Communications and Computer Networks, P.C. Gupta, PHI.
2. An Engineering Approach to Computer Networks, S. Keshav, 2nd Edition, Pearson Education.
3. Understanding Communications and Networks, 3rd Edition, W.A. Shay, Cengage Learning.
4. Computer Networking: A Top-Down Approach Featuring the Internet. James F. Kurose & Keith W. Ross, 3rd Edition, Pearson Education.
5. Data and Computer Communication, William Stallings, Sixth Edition, Pearson Education, 2000

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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## PROFESSIONAL ELECTIVE - I

### (2005PE19) IMAGE PROCESSING

B.Tech. III Year I Sem

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#### COURSE OBJECTIVES:

1. Provide a Theoretical and mathematical foundation of fundamental digital image processing concepts.
2. The topics include image acquisition; sampling and quantization; preprocessing; enhancement; restoration; segmentation; and compression.

#### Course Outcomes:

1. Demonstrate the knowledge of the basic concepts of two dimensional signal acquisition, sampling, and quantization.
2. Demonstrate the knowledge of filtering techniques.
3. Demonstrate the knowledge of 2 D transformation techniques.
4. Demonstrate the knowledge of image enhancement, segmentation, restoration and compression techniques.

#### UNIT-I

**Digital Image Fundamentals:** Fundamental Steps in Digital Image Processing, Components of an Image Processing System, A Simple Image Formation Model, Image Sampling and Quantization, Relationships Between Pixels, Imaging Geometry.

#### UNIT - II

**Image Transforms:** 2-D Fourier Transform, Properties, FFT, Walsh Transform, Hadamard Transform, Discrete Cosine Transform, Haar transform, Slant transform, Hotelling transform.

#### UNIT - III

**Image Enhancement in The Spatial Domain:** Introduction, Gray Level Transformations, Histogram Processing, Arithmetic and Logic Operations, Basics of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters.

**Image Enhancement in Frequency- Domain:** Smoothing Frequency-Domain Filters, Sharpening Frequency-Domain Filters, Homomorphic Filtering.

#### UNIT - IV

**Image Restoration:** Image Degradation/Restoration Process, Noise Models, Restoration in the Presence of Noise Only-Spatial Filtering, Periodic Noise Reduction by Frequency Domain Filtering, Inverse Filtering, Minimum Mean Square Error (Wiener) Filtering, Constrained Least Squares Filters.

#### UNIT-V

**Image Compression:** Fundamentals, Image Compression Models, Elements of information Theory, Error

Free Compression, Lossy Compression.

**Image Segmentation:** Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region-Based Segmentation, Segmentation by Morphological Watersheds

**TEXTBOOKS:**

1. R.C.Gonzalez, R.E.Woods(2002), Digital Image processing, 3rd edition, Addison Wesley/Pearson education, NewDelhi, India.

**REFERENCEBOOKS:**

1. K.Jain(1997), Fundamentals of Digital Imageprocessing, PrenticeHall of India, NewDelhi.
2. Raael C.Gonzalez (2004), Digital Image processing using MATLAB, Richard E.Woods and Steven Low price Edition, Pearson Education Asia, India.
3. William K.Pratt,(2004), Digital Image Processing, 3rd edition, John Wiley & Sons, NewDelhi, India.
4. Arthur R.Weeks, Jr.(1996), Fundamentals of Electronic Image Processing, SPIE Optical Engineering Press, NewDelhi, India.

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**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**  
**PROFESSIONAL ELECTIVE -I**  
**(2012PE01) FOUNDATIONS OF DATA SCIENCE**

B.Tech. III Year I Sem

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**COURSE OBJECTIVES:**

The course is aimed at

1. Building the fundamentals of data science.
2. Imparting design thinking capability to build big-data
3. Developing design skills of models for big data problems
4. Gaining practical experience in programming tools for data sciences
5. Empowering students with tools and techniques used in data science

**Course Outcomes:**

At the end of the course the student should be able to:

1. Apply data visualization in big-data analytics
2. Utilize EDA, inference and regression techniques
3. Utilize Matrix decomposition techniques to perform data analysis
4. Apply data pre-processing techniques
5. Apply Basic Machine Learning Algorithms

**UNIT-1**

**Big Data and Data Science** - Big Data Analytics, Business intelligence vs Big data, big data frameworks, Current landscape of analytics, data visualization techniques, visualization software.

Exploratory Data Analysis (EDA), Statistical measures, Basic tools (plots, graphs and summary statistics) of EDA, Data Analytics Lifecycle, Discovery.

**UNIT-2**

Developing Initial Hypotheses, Identifying Potential Data Sources, EDA case study, testing hypotheses on means, proportions and variances

**UNIT-3**

**Regression models:** Simple linear regression, least-squares principle, MLR, logistic regression, Multiple correlation, Partial correlation.

Matrices to represent relations between data, Linear algebraic operations on matrices - Matrix decomposition: Singular Value Decomposition (SVD) and Principal Component Analysis (PCA).

**UNIT-4**

Data cleaning - Data integration - Data Reduction - Data Transformation and Data Discretization, Feature Generation and Feature Selection, Feature Selection algorithms: Filters- Wrappers - Decision Trees -

**UNIT-5****Random Forests.**

Classifiers - Decision tree - Naive Bayes - k-Nearest Neighbors (k-NN), k-means - SVM Association Rule mining - Ensemble methods.

**TEXT BOOKS**

1. Mining of Massive Datasets. v2.1, Jure Leskovek, Anand Rajaraman and Jeffrey Ullman., Cambridge University Press. (2019). (free online)
2. Big Data Analytics, paperback 2nd ed., Seema Acharya, Subhasini Chellappan, Wiley (2019).

**REFERENCE BOOKS**

1. Doing Data Science, Straight Talk From The Frontline, Cathy O'Neil and Rachel Schutt, O'Reilly (2014).
2. Data Mining: Concepts and Techniques", Third Edition, Jiawei Han, Micheline Kamber and Jian Pei, ISBN 0123814790,(2011).
3. Big Data and Business Analytics, Jay Liebowitz, CRC press (2013)
4. Data mining methods,2nd edition, C. Rajan, Narosa (2016)

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - I  
(2005PE04) MOBILE COMPUTING**

B.Tech. III Year I Sem

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**COURSE OBJECTIVES:**

1. To make the student understand the concept of mobile computing paradigm, its novel applications and limitations.
2. To understand the typical mobile networking infrastructure through a popular GSM protocol
3. To understand the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer
4. To understand the database issues in mobile environments & data delivery models.
5. To understand the ad hoc networks and related concepts.
6. To understand the platforms and protocols used in mobile environment.

**Course Outcomes:**

- Able to think and develop new mobile application.
- Able to take any new technical issue related to this new paradigm and come up with a solution(s).
- Able to develop new ad hoc network applications and/or algorithms/protocols.
- Able to understand & develop any existing or new protocol related to mobile environment

**UNIT I: WIRELESS COMMUNICATION**

**Introduction** - Frequencies and Regulations - Signals - Antennas - Propagation Ranges and Effects - Multipath Propagation - Effects of Mobility - Multiplexing - Modulation and Shift Keying - Spread Spectrum - Frequency Hopping and Direct Sequence - Medium Access Control - Specialized MAC - SDMA - FDMA - TDMA - CDMA - Mobile Computing - Paradigm, Promises/Novel Applications and Impediments and Architecture; Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices.

**UNIT II: TELE COMMUNICATION SYSTEMS**

GSM - Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS, GPRS, DECT - UMTS and IMT- 2000 - Architecture, User Equipment, RNS, UTRAN, NodeB, RNC functions - W- CDMA - HSPA+, HSUPA, HSDPA+ - Satellite systems - History - Applications - Basics - Routing - Localization - Handover - Examples

**UNIT III: Wireless LAN and Mobile Network Layer**

Wireless LAN - Infrared vs radio transmission - Infrastructure and ad-hoc network 205 - IEEE 802.11 - HIPERLAN - Bluetooth Mobile Network Layer - Mobile IP - Dynamic host configuration protocol - Mobile ad-hoc networks -

**UNITIV: Mobile Transport Layer & Database issues**

**Mobile Transport Layer:** Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

**Database Issues:** Database Hoarding & Caching Techniques, Client-Server Computing & Adaptation, Transactional Models, Query processing, Data Recovery Process & QoS Issues.

**UNITV: Mobile Application Development**

File Systems-World wide web- Wireless application protocol (version 1.x)- i-mode- SyncML- WAP 2.0- Mobile Platform- Palm OS, Windows CE, Symbian OS, Linux for Mobile Devices, Android.

**TEXTBOOKS:**

1. Jochen Schiller, "Mobile Communications", Addison-Wesley, Second Edition, 2009.
2. Raj Kamal, "Mobile Computing", Oxford University Press, 2007, ISBN: 0195686772.

**REFERENCE BOOKS:**

1. Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", Wiley, 2002, ISBN 0471419028.
2. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, Oct 2004.



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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## PROFESSIONAL ELECTIVE -I

### (2012PC61) DWDM LAB

B.Tech. III Year I Sem

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#### COURSE OBJECTIVES:

Learn how to build a data warehouse and query it (using open source tools like Pentaho Data Integration and Pentaho Business Analytics), Learn to perform data mining tasks using a data mining toolkit (such as open source WEKA), Understand the data sets and data preprocessing, Demonstrate the working of algorithms for data mining tasks such as association rule mining, classification, clustering and regression, Exercise the data mining techniques with varied input values for different parameters.

#### COURSE OUTCOMES:

After the completion of this laboratory, the students will be able to perform

- How to use WEKA, Pentaho integration tool for data set creation
- How to preprocess the data
- To design multidimensional data models
- To implement different algorithms on dataset
- To perform data analysis and predictive modeling

#### UNIT-I. Build Data Warehouse and Explore WEKA:

- A. Build a Data Warehouse / Data Mart (using open source tools like Pentaho Data Integration tool, Pentaho Business Analytics; or other data warehouse tools like Microsoft-SSIS, Informatica, Business Objects, etc.).

Identify source tables and populate sample data

Design multi-dimensional data models namely Star, snowflake and Fact constellations schemas for any one enterprise (ex. Banking, Insurance, Finance, Healthcare, Manufacturing, Automobile, etc.).

Write ETL scripts and implement using data warehouse tools

Perform various OLAP operations such as slice, dice, roll up, drill up and pivot. Explore visualization features of the tool for analysis like identifying trends etc.

- B. Explore WEKA Data Mining / Machine Learning Toolkit Downloading and / or installation of WEKA data mining toolkit, Understand the features of WEKA toolkit such as Explorer, Knowledge Flow interface, Experimenter, command-line interface.

Navigate the options available in the WEKA (ex. Select attributes panel, Preprocess panel, Classify panel, Cluster panel, Associate panel and Visualize panel)

Study the arfffile format

Explore the available data sets in WEKA.

Load a data set(ex.Weather dataset, Iris data set,etc.) Load each data set and observe the following

List the attribute names and they types Number of records in each dataset Identify the

Class attribute (if any) Plot Histogram

Determine the number of records for each class. Visualize the data in various dimensions

### **Unit2 : Perform data preprocessing tasks and Demonstrate performing association rule mining on datasets**

- A. Explore various options available in Weka for preprocessing data and apply (like Discretization of Filters, Resample filter, etc.) on each data set
- B. Load each data set into Weka and run Apriori algorithm with different support and confidence values. Study the rules generated.
- C. Apply different discretization filters on numerical attributes and run the Apriori association rule algorithm. Study the rules generated. Derive interesting insights and observe the effect of discretization in the rule generation process.

### **Unit3 : Demonstrate performing classification on datasets**

- A. Load each dataset into Weka and run 1D3, J48 classification algorithm. Study the classification output. Compute entropy values, Kappa statistic.
- B. Extract if-then rules from the decision tree generated by the classifier, observe the confusion matrix and derive Accuracy, F-measure, TP rate, FP rate, Precision and Recall values. Apply cross-validation strategy with various fold levels and compare the accuracy results.
- C. Load each dataset into Weka and perform Naïve-bayes classification and k- Nearest-Neighbor classification. Interpret the results obtained.
- D. Plot ROC Curves
- E. Compare classification results of 1D3, J48, Naïve-Bayes and k-NN classifiers for each dataset, and deduce which classifier is performing best and poor for each dataset and justify.

### **Unit4 : Demonstrate performing clustering of datasets**

- A. Load each dataset into Weka and run simple k-means clustering algorithm with different values of k (number of desired clusters). Study the clusters formed. Observe the sum of squared errors and centroids, and derive insights.
- B. Explore other clustering techniques available in Weka.
- C. Explore visualization features of Weka to visualize the clusters. Derive interesting insights and explain.

### **Unit5 : Demonstrate performing Regression on datasets**

- A. Load each dataset into Weka and build Linear Regression model. Study the clusters formed. Use Training set option. Interpret the regression model and derive patterns and conclusions from the regression results.

- B. Use options cross-validation and Percentagesplit and repeat running the Linear Regression Model. Observe the results and derive meaningful results.

Explore Simple linear regression technique that only looks at one variable.

**RESOURCE SITES:**

1. <http://www.pentaho.com/>  
<http://www.cs.waikato.ac.nz/ml/weka/>

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - I****(1805PC66) COMPUTER NETWORKS LAB**

B.Tech. III Year I Sem

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**COURSE OBJECTIVES:**

- To understand the functionalities of various layers of OSI model
- To understand the operating system functionalities

**Course Outcomes:**

- Ability to understand the encryption and decryption concepts in Linux environment
- Ability to understand the mechanism of Noiseless channel.
- Ability to apply appropriate algorithm for the finding of shortest route.
- Ability to configure the routing table and Routing protocol

**System/Software Requirement**

Intel based desktop PCs LAN CONNECTED with minimum of 166 MHZ or faster processor with at least 64MB RAM and 100MB free disk space and language C

**Computer Networks Lab:**

1. Implement the data link layer framing methods such as character character stuffing, and bit stuffing.
2. Implement on a data set of characters the three CRC polynomials - CRC 12, CRC 16 and CRC.
3. Implement Stop and wait protocol.
4. Implement Dijkstra's algorithm to compute the Shortest path through a graph.
5. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table at each node using distance vector routing algorithm
6. To implement Open Shortest Path First (OSPF) Routing Protocol
7. Take a 64 bit playing text and encrypt the same using DES algorithm
8. Using RSA algorithm encrypt a text data and Decrypt the same.

**REFERENCES:**

1. Data Communications and Networking - Behrouz A. Forouzan, 4th Edition McGraw Hill Education, 2006.
2. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, K.W. Ross, 3rd Edition, Pearson Education.
3. Data communication and Networks - Bhusan Trivedi, Oxford University Press 2016.
4. An Engineering Approach to Computer Networks - S. Keshav, 2nd Edition, Pearson Education.

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## PROFESSIONAL ELECTIVE - I

### (2000MC05) TECHNICAL COMMUNICATIONS AND SOFTSKILLS

B.Tech. III Year I Sem

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#### INTRODUCTION:

Technical Communication and Soft skills focuses on enhancing students' communication. A thorough drill in grammar exercises is given. Various technical writing styles and skills are developed. The future placement needs of the students are met by giving them an exposure to group discussions and mock interviews.

The students hone the soft skills under the guidance of instructor whose constant evaluation helps in the professional development. This course fulfills the need of the aspirants in acquiring and improving the skills required for placements and professional success.

#### Course Objectives:

- To make the students recognize the role of Technical English in their academic and professional fields.
- To improve language proficiency and develop the required professional skills.
- To equip students with tools to organize, comprehend, draft short and long forms of technical work.

#### Course Outcomes:

- The students will be able to understand information which assists in completion of the assigned job tasks more successfully.
- Students will be able to communicate their ideas by writing projects, reports, instructions, diagrams and many other forms of professional writing.
- Students will also be able to adhere to ethical norms of scientific communication.
- Students will be able to strengthen their individual and collaborative work strategies.

#### UNIT1-Personal Evaluation

Self-Assessment and Self-Awareness-Self-Esteem-Perception and Attitudes-Values and Beliefs-Time Management-Concord

#### UNIT2-Professional Communication

Extempore-Oral Presentations-Presentation Aids-Email Writing, Business Letter Writing-Memo Writing-Transformation of Sentences

#### UNIT3-Career Planning

Group Discussion, Interviews - Leadership Skills & Team Building - Personal Goal Setting and Career Planning - Complex Problem Solving - Creativity - Role and Responsibilities of an Engineer-Tenses

#### UNIT4-Technical Writing

Principles of Effective Writing - Editing Strategies to Achieve Appropriate Technical Style-Technical Report Writing-Voice

**UNIT 5** - Ethics and Responsibilities

Personality Development in Social and Office Settings - Netiquettes - Work Culture and Cubicle Etiquettes - Correction of Sentences

**TEXTBOOKS:**

1. Dvid F. Beer and David McMurrey, Guide to writing as an Engineer, John Wiley, New York, 2004
2. Diane Hacker, Pocket Style Manual, Bedford Publication, New York, 2003. (ISBN 0312406843)
3. Shiv Khera, You Can Win, Macmillan Books, New York, 2003.

**REFERENCES:**

1. Raman Sharma, Technical Communications, Oxford Publication, London, 2004.
2. Meenakshi Raman, Prakash Singh, Business communication, Oxford Publication, New Delhi 2012.
3. Dale Jungk, Applied Writing for Technicians, McGraw Hill, New York, 2004. (ISBN: 07828357-4)
4. Shar-ma, R. and Mohan, K. Business Correspondence and Report Writing, TMH New Delhi 2002.
5. Xebec, Presentation Book, TMH New Delhi, 2000. (ISBN 0402213)

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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## PROFESSIONAL ELECTIVE -I

### (2066PC02 ) NEURAL NETWORKS

B.Tech. III Year I Sem

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#### OBJECTIVES:

- Understand the role of neural networks in engineering, artificial intelligence, and cognitive modeling.
- Provide knowledge of supervised learning in neural networks
- Provide knowledge of computation and dynamical systems using neural networks
- Provide knowledge of reinforcement learning using neural networks.
- Provide knowledge of unsupervised learning using neural networks.
- Provide hands-on experience in selected applications

#### OUTCOMES:

- This course has been designed to offer as a graduate-level/ final year undergraduate level elective subject to the students of any branch of engineering/ science, having basic foundations of matrix algebra, calculus and preferably (not essential) with a basic knowledge of optimization.
- Students and researchers desirous of working on pattern recognition and classification, regression and interpolation from sparse observations; control and optimization are expected to find this course useful. The course covers theories and usage of artificial neural networks (ANN) for problems pertaining to classification (supervised/ unsupervised) and regression.
- The course starts with some mathematical foundations and the structures of artificial neurons, which mimics biological neurons in a grossly scaled down version. It offers mathematical basis of learning mechanisms through NN. The course introduces perceptrons, discusses its capabilities and limitations as a pattern classifier and later develops concepts of multilayer perceptrons with back propagation learning.

#### UNIT-I: Introduction and ANN Structure.

Biological neurons and artificial neurons. Model of an ANN. Activation functions used in ANNs. Typical classes of network architectures.

#### UNIT-II

Mathematical Foundations and Learning mechanisms. Re-visiting vector and matrix algebra. State-space concepts. Concepts of optimization. Error-correction learning. Memory-based learning. Hebbian learning. Competitive learning.

#### UNIT-III

Single layer perceptrons. Structure and learning of perceptrons. Pattern classifier - introduction and Bayes' classifiers. Perceptron as a pattern classifier. Perceptron convergence. Limitations of a perceptrons.

**UNIT-IV: Feed forward ANN.**

Structures of Multi-layer feed forward networks. Back propagation algorithm. Back propagation-training and convergence. Functional approximation with back propagation. Practical and design issues of back propagation learning.

**UNIT-V: Radial Basis Function Networks.**

Pattern separability and interpolation. Regularization Theory. Regularization and RBF networks. RBF network design and training. Approximation properties of RBF.

**Support Vector machines.**

Linear separability and optimal hyperplane. Determination of optimal hyperplane. Optimal hyperplane for nonseparable patterns. Design of a SVM. Examples of SVM.

**TEXT BOOKS:**

1. Simon Haykin, "Neural Networks: A comprehensive foundation", Second Edition, Pearson Education Asia.
2. Satish Kumar, "Neural Networks: A classroom approach", Tata McGraw Hill, 2004.

**REFERENCE BOOKS:**

1. Robert J. Schalkoff, "Artificial Neural Networks", McGraw-Hill International Editions, 1997.



**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - I  
(2005PC12) MACHINE LEARNING****B.Tech. III Year II Sem****L T P C****3 0 0 3****COURSE OBJECTIVES:**

- To be able to formulate machine learning problems corresponding to different applications.
- To understand a range of machine learning algorithms along with their strengths and weaknesses.
- To understand the basic theory underlying machine learning.

**Course outcomes:**

At the end of the course students should be able to

- Explain theory underlying machine learning
- Construct algorithms to learn linear and non-linear models
- Implement data clustering algorithms
- Construct algorithms to learn tree and rule-based models
- Apply reinforcement learning techniques.

**UNIT I****FOUNDATIONS OF LEARNING**

Components of learning - learning models - geometric models - probabilistic models - logic models - grouping and grading - learning versus design - types of learning - supervised - unsupervised - reinforcement - theory of learning - feasibility of learning - error and noise - training versus testing - theory of generalization - generalization bound - approximation generalization tradeoff - bias and variance - learning curve

**UNIT II****INTRODUCTION TO TECHNOLOGY LANDSCAPE**

Linear classification - univariate linear regression - multivariate linear regression - regularized regression - Logistic regression - perceptron's - multilayer neural networks - learning neural networks structures - support vector machines - soft margin SVM - going beyond linearity - generalization and overfitting - regularization - validation.

**UNIT III****DISTANCE-BASED MODELS**

Nearest neighbor models - K-means - clustering around medoids - silhouettes - hierarchical clustering - k-d trees - locality sensitive hashing - non-parametric regression - ensemble learning - bagging and random forests - boosting - meta learning

**UNIT IV****TREE AND RULE MODELS**

Decision trees-learning decision trees-ranking and probability estimation trees-regression trees - clustering trees - learning ordered rule lists - learning unordered rule lists-descriptive rule learning-association rule mining- first-order rule learning

**UNIT V****REINFORCEMENT LEARNING**

Passive reinforcement learning - direct utility estimation - adaptive dynamic programming-temporal-difference learning - active reinforcement learning - exploration - learning an action utility function-Generalization in reinforcement learning-policy search-applications in game playing-applications in robot control.

**TEXTBOOKS:**

1. P.Flach, "Machine Learning: The art and science of algorithms that make sense of data", Cambridge University Press, 2012. (UNIT-IV to IV)
2. M.Mohri, A.Rostamizadeh, and A.Talwalkar, "Foundations of Machine Learning", MIT Press, 2012. (UNIT-V)

**REFERENCE BOOKS:**

1. Y.S.Abu-Mostafa, M.Magdon-Ismail, and H.-T.Lin, "Learning from Data", AML Book Publishers, 2012.
2. K.P.Murphy, "Machine Learning: A probabilistic perspective", MIT Press, 2012.
3. C.M.Bishop, "Pattern Recognition and Machine Learning", Springer, 2007.
4. T.M.Mitchell, "Machine Learning", McGraw Hill, 1997.
5. S.Russell and P.Norvig, "Artificial Intelligence: A Modern Approach", Third Edition, Prentice Hall, 2009.

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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## PROFESSIONAL ELECTIVE - I

### (2012PC02) WEBTECHNOLOGIES

B.Tech. III Year II Sem

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#### COURSE OBJECTIVES:

- To introduce PHP language for server side scripting
- To introduce XML and processing of XML Data with Java
- To introduce Server side programming with Java Servlets and JSP
- To introduce Client side scripting with Javascript and AJAX.

#### Course Outcomes:

- Gain knowledge of client side scripting, validation of forms and AJAX programming
- have understanding of server side scripting with PHP language
- have understanding of what is XML and how to parse and use XML Data with Java
- To introduce Server side programming with Java Servlets and JSP

#### UNIT-I

Introduction to the Web - Concept of Internet- History of Internet, Protocols of Internet, World Wide Web, URL, Web Server, Web Browser. HyperText Markup Language (HTML), HTML Elements, Attributes and Tags, Basic Tags, Advanced Tags - Tables, Forms, Frames, Images, Cascading Style Sheet (CSS)

#### UNIT-II

Client side Scripting: Introduction to Javascript: Javascript language - declaring variables, scope of variables, functions, event handlers (onclick, onsubmit etc.), Form validation, Simple AJAX Application. XML: Introduction to XML, XML DTD, W3C XML Schema, Parsing XML, XPath, XML Transformation, Document Object Model, XHTML

#### UNIT-III

**Introduction to Servlets:** Common Gateway Interface (CGI), Lifecycle of a Servlet, deploying a servlet, The Servlet API, Reading Servlet parameters, Reading Initialization parameters, Handling Http Request & Responses, Using Cookies and Sessions, connecting to a database using JDBC.

#### UNIT-IV

Introduction to JSP: The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP.

#### UNIT-V

Introduction to PHP: Declaring variables, datatypes, arrays, strings, operators, expressions, control structures, functions,

Reading data from web form controls like text boxes, radio buttons, lists etc., Handling File Uploads, Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies..

FILE HANDLING IN PHP: File operations like opening, closing, reading, writing, appending, deleting etc. on text and binary files, listing directories.

### **TEXTBOOKS**

1. Web Technologies, Uttam K Roy, Oxford University Press
2. The Complete Reference PHP - Steven Holzner, Tata McGraw-Hill

### **REFERENCE BOOKS**

1. Web Programming, building internet applications, Chris Bates 2<sup>nd</sup> edition, Wiley Dreamtech
2. Java Server Pages - Hans Bergsten, SPDO'Reilly,
3. JavaScript, D. Flanagan, O'Reilly, SPD.
4. Beginning Web Programming - Jon Duckett WROX.
5. Programming world wide web, R. W. Sebesta, Fourth Edition, Pearson.
6. Internet and World Wide Web - How to program. Dietel and Nieto, Pearson.

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**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II  
(2005PE07) COMPUTER VISION****B.Tech. III Year II Sem****L T P C****3 0 0 3**

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**COURSE OBJECTIVES:**

- To review image processing techniques for computer vision.
- To understand shape and region analysis.
- To understand Hough Transform and its applications to detect lines, circles, ellipses.
- To understand three-dimensional image analysis techniques.
- To understand motion analysis.
- To study some applications of computer vision algorithms.

**Course Outcomes:**

Upon completion of this course, the students should be able to

- Implement fundamental image processing techniques required for computer vision.
- Perform shape analysis.
- Implement boundary tracking techniques.
- Apply chain codes and other region descriptors.
- Apply Hough Transform for line, circle, and ellipse detections.
- Apply 3D vision techniques.
- Implement motion related techniques.
- Develop applications using computer vision techniques.

**UNIT - I**

**Image Processing Foundations:** Review of image processing techniques - classical filtering operations - thresholding techniques - edge detection techniques - corner and interest point detection - mathematical morphology - texture.

**UNIT - II**

**Shapes and Regions:** Binary shape analysis - connectedness - object labeling and counting - size filtering - distance functions - skeletons and thinning - deformable shape analysis - boundary tracking procedures - active contours - shape models and shape recognition - centroidal profiles - handling occlusion - boundary length measures - boundary descriptors - chain codes - Fourier descriptors - region descriptors - moments.

**UNIT - III**

**Hough Transform:** Line detection - Hough Transform (HT) for line detection - foot-ofnormal method - line localization - line fitting - RANSAC for straight line detection - HT

based circular object detection- accurate center location - speed problem - ellipse detection - Case study: Human Iris location- hole detection - generalized Hough Transform (GHT) - spatial matched filtering - GHT for ellipse detection - object location - GHT for feature collation.

#### UNIT - IV

3D Vision and Motion: Methods for 3D vision - projection schemes - shape from shading - photometric stereo - shape from texture - shape from focus - active range finding - surface representations - point-based representation - volumetric representations - 3D object recognition - 3D reconstruction - introduction to motion - triangulation - bundle adjustment - translational alignment - parametric motion - spline-based motion - optical flow - layered motion.

#### UNIT - V

**Applications:** Application: Photo album - Face detection - Face recognition - Eigen faces - Active appearance and 3D shape models of faces Application: Surveillance - foregroundbackground separation - particle filters - Chamfer matching, tracking, and occlusion - combining views from multiple cameras - human gait analysis Application: In-vehicle vision system: locating roadway - road markings - identifying road signs - locating pedestrians.

#### TEXT BOOKS:

1. Simon J. D. Prince, -Computer Vision: Models, Learning, and Inference, Cambridge University Press, 2012.
2. Mark Nixon and Alberto S. Aquado, -Feature Extraction & Image Processing for Computer Vision, Third Edition, Academic Press, 2012.
3. E. R. Davies, - Computer & Machine Vision, Fourth Edition, Academic Press, 2012.

#### REFERENCES:

1. D. L. Baggio et al., -Mastering OpenCV with Practical Computer Vision Projects, Packt Publishing, 2012.
2. Jan Erik Solem, -Programming Computer Vision with Python: Tools and algorithms for analyzing images, O'Reilly Media, 2012.
3. R. Szeliski, -Computer Vision: Algorithms and Applications, Springer 2011

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# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## PROFESSIONAL ELECTIVE - II

### (2005PE15) TEXT ANALYTICS

B.Tech. III Year II Sem

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#### COURSE OBJECTIVES

Upon completion of this course, the students will be able to

1. Understand the basics of Natural language processing
2. Analyze the text syntactically
3. Analyze the text content Semantically
4. Implement recurrent network for language models
5. Implement a sentiment classification and chat bot systems

**Prerequisites: AI, Python Programming**

#### CHAPTER 1: INTRODUCTION

Introduction to NLP, Regular Expressions, Words, Corpora, Text Normalization, Minimum Edit distance, N gram Language Models, Evaluating Language Models

#### CHAPTER 2: SYNTACTIC ANALYSIS

English Word Classes, The Penn Treebank Part-of-Speech Tagset, Part-of-Speech Tagging, HMM Part-of-Speech Tagging, Maximum Entropy Markov Models, Grammar Rules for English, Treebanks, Grammar Equivalence and Normal form, Lexicalized Grammar.

#### CHAPTER 3: SEMANTIC ANALYSIS

Representation of Sentence Meaning: Computational Desiderata for Representations, Model-Theoretic Semantics, First-Order Logic, Event and State Representations, Description Logics, Semantic roles, Semantic role labeling

#### CHAPTER 4: SEQUENCE PARSING WITH RECURRENT NETWORKS

Simple Recurrent Networks, Applications of RNNs, Deep Networks: Stacked and Bidirectional RNNs, Managing Context in RNNs: LSTMs and GRUs, Words, Characters and Byte-Pairs.

#### CHAPTER 5: CASE STUDY

Sentiment Classification, Dialog Systems and Chat bots

#### TEXT BOOKS

1. Dan Jurafsky and James H. Martin. Speech and Language Processing (3rd ed. draft), 2019.

#### REFERENCE BOOKS

1. Steven Bird, Ewan Klein, and Edward Loper, Natural Language Processing with Python, First Edition, O'reilly, 2009

- 2 Yoav Goldberg, University of Toronto, Neural Network Methods for Natural language Pro-cessing,Morgan & Claypool, 2017
- 3 Christopher D. Manning, and Hinrich Schütze. Foundations of statistical natural language processing. First Edition, MIT press, 1999



**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II****(2005PE16) SOFTWARE TESTING METHODOLOGIES**

B.Tech. III Year II Sem

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**PREREQUISITES**

1. A course on "Software Engineering"

**Course Objectives**

1. To provide knowledge of the concepts in software testing such as testing process, criteria, strategies, and methodologies.
2. To develop skills in software test automation and management using latest tools.

Course Outcomes: Design and develop the best test strategies in accordance to the development model.

**UNIT - I**

Introduction: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of Bugs  
Flow graphs and Path testing: Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

**UNIT - II**

Transaction Flow Testing: transaction flows, transaction flow testing techniques. Dataflow testing: Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing. Domain Testing: domains and paths, Nice & ugly domains, domain

testing, domains and interfaces testing, domain and interface testing, domains and testability.

**UNIT - III**

Paths, Path products and Regular expressions: path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.

Logic Based Testing: overview, decision tables, path expressions, kv charts, specifications.

**UNIT - IV**

State, State Graphs and Transition testing: state graphs, good & bad state graphs, state testing, Testability tips.

**UNIT - V**

Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools. (Student should be given an exposure to a tool like JMeter or Win-runner).

**Text Books:**

1. Software Testing techniques - BarisBeizer, Dreamtech, second edition.
2. Software Testing Tools - Dr. K. V. K. K. Prasad, Dreamtech.

**REFERENCES:**

1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing Techniques - SPD(Oreille)
3. Software Testing in the Real World - Edward Kit, Pearson.
4. Effective methods of Software Testing, Perry, John Wiley.
5. Art of Software Testing - Meyers, John Wiley.

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II****(2005PE17) AI SEARCH METHOD FOR PROBLEM SOLVING****B.Tech. III Year II Sem****L T P C****3 0 0 3****COURSE OBJECTIVES:**

For an autonomous agent to behave in an intelligent manner it must be able to solve problems. This means it should be able to arrive at decisions that transform a given situation into a desired or goal situation. The agent should be able to imagine the consequence of its decisions to be able to identify the ones that work. In this first course on AI we study a wide variety of search methods that agents can employ for problem solving.

**COURSE OUT COMES: AI:**

Knowledge Representation and Reasoning - student is able to find how an agent can represent its world and reason with what it knows. These two courses should lay a strong foundation for artificial intelligence, which the student can build upon. A third short course - AI: Constraint Satisfaction Problems - presents a slightly different formalism for problem solving, one in which the search and reasoning processes mentioned above can operate together.

**UNIT-1:**

**Introduction:** History, Can Machines think?, Turing Test, Winograd Schema Challenge, Language and Thought, Wheels & Gears

**Introduction:** Philosophy, Mind, Reasoning, Computation, Dartmouth Conference, The Chess Saga, Epiphenomena

**UNIT-2:**

State Space Search: Depth First Search, Breadth First Search, Depth First Iterative Deepening

Heuristic Search: Best First Search, Hill Climbing, Solution Space, TSP, Escaping Local Optima, Stochastic Local Search

Population Based Methods: Genetic Algorithms, SAT, TSP, emergent Systems, Ant Colony Optimization

**UNIT-3:**

Finding Optimal Paths: Branch & Bound, A\*, Admissibility of A\*, Informed Heuristic Functions Space Saving Versions of A\*: Weighted A\*, IDA\*, RBFS, Monotone Condition, Sequence Alignment, DCFS, SMGS, Beam Stack Search

Game Playing: Game Theory, Board Games and Game Trees, Algorithm Minimax, AlphaBeta and SSS\*

**UNIT-1V:**

Automated Planning: Domain Independent Planning, Blocks World, Forward & Backward Search, Goal Stack Planning, Plan Space Planning

Problem Decomposition: Means Ends Analysis, Algorithm Graphplan, Algorithm AO\*

Rule Based Expert Systems: Production Systems, Inference Engine, Match-Resolve-Execute, Rete Net

**UNIT-V:**

Deduction as Search: Logic, Soundness, Completeness, First Order Logic, Forward Chaining, Backward Chaining  
Constraint Processing: CSPs, Consistency Based Diagnosis, Algorithm Backtracking, Arc Consistency, Algorithm  
Forward Checking

**TEXT BOOK:**

1. Deepak Khemani. A First Course in Artificial Intelligence, McGraw Hill Education (India), 2013.

**REFERENCE BOOKS:**

1. Stefan Edelkamp and Stefan Schroedl. Heuristic Search: Theory and Applications, Morgan Kaufmann, 2011.
2. John Haugeland, Artificial Intelligence: The Very Idea, A Bradford Book, The MIT Press, 1985.
3. Pamela McCorduck, Machines Who Think: A Personal Inquiry into the History and Prospects of Artificial Intelligence, A K Peters/CRC Press; 2 edition, 2004.

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II****(2012PE03) WEB MINING****B.Tech. III Year II Sem****L T P C****3 0 0 3****COURSE OBJECTIVES:**

- To describe web mining and understand the need for web mining
- To differentiate between Web mining and data mining
- To understand the different application areas for web mining
- To understand the different methods to introduce structure to web-based data
- To describe Web mining, its objectives, and its benefits
- To understand the methods of Web usage mining

**UNIT - I :**

Introduction to Web Data Mining and Data Mining Foundations, Introduction - World Wide Web (WWW), A Brief History of the Web and the Internet, Web Data Mining-Data Mining, Web Mining. Data Mining Foundations - Association Rules and Sequential Patterns - Basic Concepts of Association Rules, Apriori Algorithm- Frequent Itemset Generation, Association Rule Generation, Data Formats for Association Rule Mining, Mining with multiple minimum supports - Extended Model, Mining Algorithm, Rule Generation, Mining Class Association Rules, Basic Concepts of Sequential Patterns, Mining Sequential Patterns on GSP, Mining Sequential Patterns on PrefixSpan, Generating Rules from Sequential Patterns.

**UNIT - II :**

Information Retrieval and Web Search: Basic Concepts of Information Retrieval, Information Retrieval Methods - Boolean Model, Vector Space Model and Statistical Language Model, Relevance Feedback, Evaluation Measures,

**UNIT - III :**

Text and Web Page Preprocessing - Stopword Removal, Stemming, Web Page Preprocessing, Duplicate Detection, Inverted Index and Its Compression - Inverted Index, Search using Inverted Index, Index Construction, Index Compression, Latent Semantic Indexing - Singular Value Decomposition, Query and Retrieval, Web Search, Meta Search, Web Spamming.

**UNIT - IV :**

Link Analysis and Web Crawling: Link Analysis - Social Network Analysis, Co-Citation and Bibliographic Coupling, Page Rank Algorithm, HITS Algorithm.

**Web Crawling-** A Basic Crawler Algorithm- Breadth First Crawlers, Preferential Crawlers, Implementation Issues - Fetching, Parsing, Stopword Removal, Link Extraction, Spider Traps, Page Repository, Universal Crawlers, Focused Crawlers, Topical Crawlers, Crawler Ethics and Conflicts.

**UNIT - V:**

**Opinion Mining and Web Usage Mining**

Opinion Mining - Sentiment Classification - Classification based on Sentiment Phrases, Classification Using Text Classification Methods, Feature based Opinion Mining and Summarization - Problem Definition, Object feature extraction, Feature Extraction from Pros and Cons of Format1, Feature Extraction from Reviews of Format 2 and 3, Comparative Sentence and Relation Mining, Opinion Search and Opinion Spam.

Web Usage Mining - Data Collection and Preprocessing- Sources and Types of Data, Key Elements of Web usage Data Preprocessing, Data Modeling for Web Usage Mining, Discovery and Analysis of Web usage Patterns -Session and Visitor Analysis, Cluster Analysis and Visitor Segmentation, Association and Correlation Analysis, Analysis of Sequential and Navigation Patterns.

**TEXT BOOK:**

- Web Data Mining: Exploring Hyperlinks, Contents, and Usage Data by Bing Liu (Springer Publications)

**REFERENCES BOOKS:**

- Data Mining: Concepts and Techniques, Second Edition Jiawei Han, Micheline Kamber (Elsevier Publications)
- Web Mining:: Applications and Techniques by Anthony Scime
- Mining the Web: Discovering Knowledge from Hypertext Data by Soumen Chakrabarti

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II****(2005PE18) CYBER SECURITY**

B.Tech. III Year II Sem

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**UNIT - I**

**Introduction to Cybercrime:** Introduction, Cyber crime and Information Security, Who are Cybercriminals, Classifications of Cybercrimes, Cybercrime: The legal Perspectives and Indian Perspective, Cybercrime and the Indian ITA 2000, A Global Perspective on Cybercrimes.

**UNIT - II**

**Cyber Offenses:** How Criminals Plan Them: Introduction, How Criminals plan the Attacks, Social Engineering, Cyber stalking, Cyber cafe and Cybercrimes, Botnets: The Fuel for Cybercrime, Attack Vector, Cloud Computing.

**UNIT - III**

**Cybercrime: Mobile and Wireless Devices:** Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones, Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile, Organizational Security Policies and Measures in Mobile Computing Era, Laptops.

**UNIT - IV**

**Tools and Methods Used in Cybercrime:** Introduction, Proxy Servers and Anonymizers, Phishing, Password Cracking, Key loggers and Spywares, Virus and Worms, Trojan Horse and Backdoors, Steganography, DoS and DDoS attacks, SQL Injection, Buffer Overflow.

**UNIT - V**

**Cyber Security:** Organizational Implications, Introduction, Cost of Cybercrimes and IPR issues, Web threats for Organizations, Security and Privacy Implications, Social media marketing: Security Risks and Perils for Organizations, Social Computing and the associated challenges for Organizations.

**TEXT BOOK:**

1. Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole and Sunil Belapure, Wiley INDIA.

**REFERENCE BOOKS:**

1. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II****(2000MC06) INDIAN TRADITIONAL KNOWLEDGE**

B.Tech. III Year II Sem

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**COURSE OBJECTIVES:**

- To facilitate the students with the concepts of Indian traditional knowledge and to make them understand the Importance of roots of knowledge system.

**Course Outcomes:**

After completion of the course, students will be able to:

- Upon completion of the course, the students are expected to:
- Understand the concept of Traditional knowledge and its importance
- Know the need and importance of protecting traditional knowledge.
- Know the various enactments related to the protection of traditional knowledge.
- Understand the concepts of Intellectual property to protect the traditional knowledge.

**UNIT I: Introduction to traditional knowledge:**

Define traditional knowledge, nature and characteristics, scope and importance, kinds of traditional knowledge, the physical and social contexts in which traditional knowledge develop, the historical impact of social change on traditional knowledge systems. Indigenous Knowledge (IK), characteristics, traditional knowledge vis-à-vis indigenous knowledge, traditional knowledge Vs western knowledge traditional knowledge vis-à-vis formal knowledge

**UNIT II: Protection of traditional knowledge:**

The need for protecting traditional knowledge Significance of TK Protection, value of TK in global economy, Role of Government to harness TK.

**UNIT III: Legal framework and TK:**

- A: The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, Plant Varieties Protection and Farmer's Rights Act, 2001 (PPVFR Act);
- B: The Biological Diversity Act 2002 and Rules 2004, the protection of traditional knowledge bill, 2016. Geographical indicators act 2003.

**UNIT IV: Traditional knowledge and intellectual property:**

Systems of traditional knowledge protection, Legal concepts for the protection of traditional knowledge, Certain non IPR mechanisms of traditional knowledge protection, Patents and traditional knowledge, Strategies to increase protection of traditional knowledge, global legal FORA for increasing protection of Indian Traditional Knowledge.

**UNIT V: Traditional knowledge in different sectors:**



Traditional knowledge and engineering, Traditional medicine system, TK and biotechnology, TK in agriculture, Traditional societies depend on it for their food and healthcare needs, Importance of conservation and sustainable development of environment, Management of biodiversity, Food security of the country and protection of TK.

**TEXTBOOKS:**

1. Traditional Knowledge System in India, by Amit Jha, 2009.
2. Traditional Knowledge System and Technology in India by Basanta Kumar Mohanta and Vipin Kumar Singh, Pratibha Prakashan 2012.

**REFERENCE BOOKS:**

1. Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002
2. "Knowledge Traditions and Practices of India" Kapil Kapoor 1, Michel Danino 2

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II****(2012PC62) WEB TECHNOLOGIES LAB****B.Tech. III Year II Sem****L T P C****0 0 3 1.5****COURSE OBJECTIVES:**

- To enable the student to program web applications using the following technologies HTML, Javascript, AJAX, Servlets, JSP and PHP

**Course Outcomes:**

- Use XAMPP Stack for web applications
- Use Tomcat Server for Servlets and JSPs
- Write simple applications with technologies like HTML, Javascript, AJAX, PHP, Servlets and JSPs
- Connect to Database and get results

**Note:**

- i. Use XAMPP Stack (Cross Platform, Apache, MariaDB, PHP and Perl) for the Lab Experiments. Though not mandatory, encourage the use of Eclipse platform wherever applicable
  - ii. The list suggests the minimum program set. Hence, the concerned staff is requested to add more problems to the list as needed.
1. Install the following on the local machine
    - Apache Web Server (if not installed)
    - Tomcat Application Server locally
    - Install MariaDB (formerly called as MySQL if not installed)
    - Install PHP and configure it to work with Apache web server and MySQL (if not already configured)
  2. Design a simple online shopping website with different web pages. (Note: Use frames, hyperlinks, Images, tables etc...)
  3. Re-design the above website applying CSS.
  4. Design login page, registration page and apply the client-side validations using JavaScript.
  5. Create an XML document that contains 10 users information. Write a Java program, which takes User Id as input and returns the user details by taking the user information from the XML document using (a) DOM Parser and (b) SAX parser. Implement the following web applications using (a) PHP, (b) Servlets and (c) JSP:
  6. A user validation web application, where the user submits the login name and password to the server. The name and password are checked against the data already available in Database and if the data

matches, a successful login page is returned. Otherwise a failure message is shown to the user.

7. Modify the above program to use AJAX to show the result on the same page below the submit button.
8. A simple calculator web application that takes two numbers and an operator (+, -, /, \* and %) from an HTML page and returns the result page with the operation performed on the operands.
9. A web application takes a name as input and on submit it shows a hello <name> page where <name> is taken from the request. It shows the start time at the right top corner of the page and provides a logout button. On clicking this button, it should show a logout page with Thank You <name> message with the duration of usage (hint: Use session to store name and time).
10. A web application that takes name and age from an HTML page. If the age is less than 18, it should send a page with "Hello <name>, you are not authorized to visit this site" message, where <name> should be replaced with the entered name. Otherwise it should send "Welcome <name> to this site" message.
11. A web application for implementation:  
The user is first served a login page which takes user's name and password. After submitting the details the server checks these values against the data from a database and takes the following decisions.  
If name and password matches, serves a welcome page with user's full name.  
If name matches and password doesn't match, then serves "password mismatch" page  
If name is not found in the database, serves a registration page, where user's full name is asked and on submitting the full name, it stores, the login name, password and full name in the database (hint: use session for storing the submitted login name and password)
12. A web application that lists all cookies stored in the browser on clicking "List Cookies" button. Add cookies if necessary.

### REFERENCE BOOKS:

1. The Complete Reference PHP - Steven Holzner, Tata McGraw-Hill
2. Web Programming, building internet applications, Chris Bates 2nd edition, Wiley Dreamtech
3. Java Server Pages - Hans Bergsten, SPDO'Reilly
4. JavaScript, D. Flanagan, O'Reilly, SPD.
5. Internet and World Wide Web - How to program, Dietel and Nieto, Pearson

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

## PROFESSIONAL ELECTIVE - II

### (2005PC67) MACHINE LEARNING LAB

B.Tech. III Year II Sem

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#### COURSE OBJECTIVE:

The objective of this lab is to get an overview of the various machine learning techniques and can able to demonstrate them using python.

#### Course Outcomes:

After the completion of the course the student can able to:

1. understand complexity of Machine Learning algorithms and their limitations;
2. understand modern notions in data analysis-oriented computing;
3. be capable of confidently applying common Machine Learning algorithms in practice and implementing their own;
4. Be capable of performing experiments in Machine Learning using real-world data.

#### List of Experiments

1. The probability that it is Friday and that a student is absent is 3 %. Since there are 5 school days in a week, the probability that it is Friday is 20 %. What is the probability that a student is absent given that today is Friday? Apply Baye's rule in python to get the result. (Ans: 15%)
2. Extract the data from database using python
3. Implement k-nearest neighbours classification using python
4. Given the following data, which specify classifications for nine combinations of VAR1 and VAR2 predict a classification for a case where VAR1=0.906 and VAR2=0.606, using the result of k-means clustering with 3 means (i.e., 3 centroids)

VAR1	VAR2	CLASS
1.713	1.586	0
0.180	1.786	1
0.353	1.240	1
0.940	1.566	0
1.486	0.759	1
1.266	1.106	0
1.540	0.419	1

0.459      1.799      1

0.773      0.186      1

5. The following training examples map descriptions of individuals onto high, medium and low credit-worthiness.

medium skiing design single twenties no ->highRisk

high golf trading married forties yes ->lowRisk

low speedway transport married thirties yes ->medRisk

medium football banking single thirties yes ->lowRisk

high flying media married fifties yes ->highRisk

low football security single twenties no ->medRisk

medium golf media single thirties yes ->medRisk

medium golf transport married forties yes ->lowRisk

high skiing banking single thirties yes ->highRisk

low golf unemployed married forties yes ->highRisk

Input attributes are (from left to right) income, recreation, job, status, age-group, home-owner. Find the unconditional probability of 'golf' and the conditional probability of 'single' given 'medRisk' in the dataset?

6. Implement linear regression using python.
7. Implement Naïve Bayes theorem to classify the English text
8. Implement an algorithm to demonstrate the significance of genetic algorithm
9. Implement the finite words classification system using Back-propagation algorithm

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II****(2066PC03) NATURAL LANGUAGE PROCESSING**

B.Tech. IV Year I Sem

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**Prerequisites:** Data structures, finite automata and probability theory

**Course Objectives:**

- Introduce to some of the problems and solutions of NLP and their relation to linguistics and statistics.

**Course Outcomes:**

- Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
- Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems
- Able to manipulate probabilities, construct statistical models over strings and trees, and estimate parameters using supervised and unsupervised training methods.
- Able to design, implement, and analyze NLP algorithms
- Able to design different language modeling Techniques.

**UNIT - I**

Finding the Structure of Words: Words and Their Components, Issues and Challenges, Morphological Models.  
Finding the Structure of Documents: Introduction, Methods, Complexity of the Approaches, Performances of the Approaches

**UNIT - II**

Syntax Analysis: Parsing Natural Language, Treebanks: A Data-Driven Approach to Syntax, Representation of Syntactic Structure, Parsing Algorithms, Models for Ambiguity Resolution in Parsing, Multilingual Issues

**UNIT - III**

Semantic Parsing: Introduction, Semantic Interpretation, System Paradigms, Word Sense Systems, Software.

**UNIT - IV**

Predicate-Argument Structure, Meaning Representation Systems, Software.

**UNIT - V**

Discourse Processing: Cohesion, Reference Resolution, Discourse Cohesion and Structure

Language Modeling: Introduction, N-Gram Models, Language Model Evaluation, Parameter

Estimation, Language Model Adaptation, Types of Language Models, Language-Specific Modeling Problems, Multilingual and Crosslingual Language Modeling

**TEXT BOOKS:**

1. Multilingual natural Language Processing Applications: From Theory to Practice - Daniel M.Bikel and ImedZitouni, Pearson Publication
2. Natural Language Processing and Information Retrieval: Tanvier Siddiqui, U.S. Tiwary

**REFERENCE BOOK:**

1. Speech and Natural Language Processing - Daniel Jurafsky& James H Martin, Pearson Publications

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**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**  
**PROFESSIONAL ELECTIVE - II**  
**(2066PC04) DEEPLARNING**

B.Tech. IV Year I Sem

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**COURSE OBJECTIVE:**

By the end of the course, students will be able to:

- Understand complexity of Deep Learning algorithms and their limitations
- Understand modern notions in data analysis oriented computing;
- Be capable of confidently applying common Deep Learning algorithms in practice and implementing their own;
- Be capable of performing distributed computations;
- Be capable of performing experiments in Deep Learning using real-world data.

**Course Outcomes:**

By the end of this deep learning course with TensorFlow, the student will be able to:

- Understand the concepts of Tensor-Flow, its main functions, operations and the execution pipeline
- Implement deep learning algorithms, understand neural networks and traverse the layers of data abstraction which will empower the student to understand data more precisely.
- Learn topics such as convolutional neural networks, recurrent neural networks, training deep networks and high-level interfaces
- Build deep learning models in TensorFlow and interpret the results
- Understand the language and fundamental concepts of artificial neural networks
- Troubleshoot and improve deep learning models
- Build a deep learning project
- Differentiate between machine learning, deep learning and artificial intelligence

**UNIT 1:**

Introduction to TensorFlow: Computational Graph, Key highlights, Creating a Graph, Regression example, Gradient Descent, Tensor Board, Modularity, Sharing Variables, Keras

Perceptrons: What is a Perceptron, XOR Gate

**UNIT 2:**

Activation Functions: Sigmoid, ReLU, Hyperbolic Fns, Softmax  
Artificial Neural Networks: Introduction, Perceptron Training Rule, Gradient Descent Rule



**UNIT 3:**

Gradient Descent and Back propagation: Gradient Descent, Stochastic Gradient Descent, Backpropagation, Some problems in ANN Optimization and Regularization: Overfitting and Capacity, Cross Validation, Feature Selection, Regularization, Hyper parameters

**UNIT 4:**

Introduction to Convolutional Neural Networks: Introduction to CNNs, Kernel filter, Principles behind CNNs, Multiple Filters, CNN applications.

Introduction to Recurrent Neural Networks: Introduction to RNNs, Unfolded RNNs, Seq2Seq RNNs, LSTM, RNN applications

**UNIT 5:**

Deep Learning applications: Image Processing, Natural Language Processing, Speech Recognition, Video Analytics

**TEXTBOOK**

1. Goodfellow, I., Bengio, Y., and Courville, A., Deep Learning, MIT Press, 2016.

**REFERENCES**

1. Bishop, C., M., Pattern Recognition and Machine Learning, Springer, 2006.
2. Yegnanarayana, B., Artificial Neural Networks PHI Learning Pvt. Ltd, 2009.
3. Golub, G., H., and Van Loan, C., F., Matrix Computations, JHU Press, 2013.
4. Satish Kumar, Neural Networks: A Classroom Approach, Tata McGraw-Hill Education, 2004.

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II  
(2012PE04) BUSINESS ANALYTICS**

B.Tech. IV Year I Sem

L T P C

3 0 0 3

**COURSE OBJECTIVE:**

- To explore the fundamental concepts of data analytics.
- To learn the principles and methods of statistical analysis
- Discover interesting patterns, analyze supervised and unsupervised models and estimate the accuracy of the algorithms.
- To understand the various search methods and visualization techniques.

**Course Outcomes**

After completion of this course students will be able to

- Understand the impact of data analytics for business decisions and strategy
- Carry out data analysis/statistical analysis
- To carry out standard data visualization and formal inference procedures
- Design Data Architecture
- Understand various Data Sources

**UNIT - I**

Data Management: Design Data Architecture and manage the data for analysis, understand various sources of Data like Sensors/Signals/GPS etc. Data Management, Data Quality(noise, outliers, missing values, duplicate data) and Data Processing & Processing.

**UNIT - II**

Data Analytics: Introduction to Analytics, Introduction to Tools and Environment, Application of Modeling in Business, Databases & Types of Data and variables, Data Modeling Techniques, Missing Imputations etc. Need for Business Modeling.

**UNIT - III**

Regression - Concepts, Blue property assumptions, Least Square Estimation, Variable Rationalization, and Model Building etc.

Logistic Regression: Model Theory, Model fit Statistics, Model Construction, Analytics applications to various Business Domains etc.

**UNIT - IV**

Object Segmentation: Regression Vs Segmentation - Supervised and Unsupervised Learning, Tree Building - Regression, Classification, Overfitting, Pruning and Complexity, Multiple Decision Trees etc. Time Series Methods: Arima, Measures of Forecast Accuracy, STL approach, Extract features from generated model as Height, Average Energy etc and Analyze for prediction

**UNIT - V**

Data Visualization: Pixel-Oriented Visualization Techniques, Geometric Projection Visualization Techniques, Icon-Based Visualization Techniques, Hierarchical Visualization Techniques, Visualizing Complex Data and Relations.

**TEXT BOOKS**

1. Student's Handbook for Associate Analytics - II, III.
2. Data Mining Concepts and Techniques, Han, Kamber, 3rd Edition, Morgan Kaufmann Publishers.

**REFERENCE BOOKS**

1. Introduction to Data Mining, Tan, Steinbach and Kumar, Addison Wesley, 2006.
2. Data Mining Analysis and Concepts, M. Zaki and W. Meira
3. Mining of Massive Datasets, Jure Leskovec Stanford Univ. AnandRajaramanMilliway Labs Jeffrey D Ullman Stanford Univ.

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II****(2005PE19) COGNITIVE COMPUTING****B.Tech. IV Year I Sem****L T P C****3 0 0 3****OBJECTIVES:**

- To learn about design of cognitive systems
- To be familiar with techniques to support cognitive systems
- Able to analyze the effectiveness of a cognitive system
- Understand the deployment of cognitive applications
- Understand the development process of cognitive systems

**Outcomes:**

- Clear understanding of the elements and principles in designing a cognitive system
- Appreciate the role of Natural language processing and knowledge representation in Cognitive systems
- Analyze a cognitive computing system through case studies
- Able to select an appropriate approach to build a cognitive system
- Provide a system flow to deploy a cognitive application

**UNIT I INTRODUCTION TO COGNITIVE COMPUTING**

The Foundation of Cognitive Computing-Cognitive Computing as a New Generation-The Uses of Cognitive Systems-What Makes a System Cognitive?-Artificial Intelligence as the Foundation of Cognitive Computing-Understanding Cognition-Understanding Complex Relationships Between Systems-The Elements of a Cognitive System-Design Principles for Cognitive Systems-Components of a Cognitive System-Building the Corpus-Bringing Data into the Cognitive System-Machine Learning-Hypotheses Generation and Scoring-Presentation and Visualization Services.

**UNIT II : NATURAL LANGUAGE PROCESSING IN COGNITIVE SYSTEMS**

Natural Language Processing in Support of a Cognitive System-The Role of NLP in a Cognitive System-Semantic Web-Applying Natural Language Technologies to Business Problems. Representing Knowledge in Taxonomies and Ontologies-Representing Knowledge-Defining Taxonomies and Ontologies-Explaining How to Represent Knowledge-Models for Knowledge Representation-Implementation Considerations.

**UNIT III : ADVANCED ANALYTICS IN COGNITIVE COMPUTING**

Applying Advanced Analytics to Cognitive Computing-Advanced Analytics Is on a Path to Cognitive Computing-Key Capabilities in Advanced Analytics-Using Advanced Analytics to Create Value-Impact of Open Source Tools on Advanced Analytics- Case studies.

**UNIT IV : COGNITIVE SYSTEMS APPROACHES**

The Role of Cloud and Distributed Computing in Cognitive Computing-Leveraging Distributed Computing for Shared Resources-Why Cloud Services Are Fundamental to Cognitive Computing Systems-The Business Implications of Cognitive Computing: Preparing for Change-Advantages of New Disruptive Models-The Difference with a Cognitive Systems

Approach-Meshing Data Together Differently-Using Business Knowledge to Plan for the Future-Building Business Specific Solutions-Making Cognitive Computing a Reality.

**UNIT V : BUILDING A COGNITIVE APPLICATION**

The Process of Building a Cognitive Application-The Emerging Cognitive Platform-Defining the Objective-Defining the Domain-Understanding the Intended Users and Defining their

Attributes-Defining Questions and Exploring Insights-Creating and Refining the Corporate Training and Testing-

**CASE STUDY:** Building a Cognitive Healthcare Application Foundations of Cognitive Computing for Healthcare-Constituents in the Healthcare

Ecosystem-Cognitive Applications across the Healthcare Ecosystem- Emerging Cognitive Computing Areas- Future Applications for Cognitive Computing.

**REFERENCES:**

1. Developing Cognitive Applications  
<https://www.ibm.com/developerworks/learn/cognitive/>
2. Machine Learning and Cognitive Systems: The Next Evolution of Enterprise intelligence,<https://www.wired.com/.../machine-learning-cognitive-system>.
3. Marcia Kaufman Adrian Bowles, Judith Hurwitz, ?Cognitive Computing and Big Data Analytics?, First Edition, Wiley.
4. Steven Bird, Ewan Klein, Edward Loper, ? Natural Language Processing with Python - Analyzing text with natural language toolkit?, O'Reilly Media , 2009.
5. Tom M. Mitchell, ?Machine Learning?, McGraw Hill.

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II  
(2005PE08) CLOUD COMPUTING**

B.Tech. IV Year I Sem

L T P C

3 0 0 3

**COURSE OBJECTIVES:**

- This course provides an insight into cloud computing
- Topics covered include- distributed system models, different cloud service models, service-oriented architectures, cloud programming and software environments, resource management.

**Course Outcomes:**

- Ability to understand various service delivery models of a cloud computing architecture.
- Ability to understand the ways in which the cloud can be programmed and deployed.
- Understanding cloud service providers.

**UNIT - I**

Computing Paradigms: High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing, Bio computing, Mobile Computing, Quantum Computing, Optical Computing, Nanocomputing.

**UNIT - II**

Cloud Computing Fundamentals: Motivation for Cloud Computing, The Need for Cloud Computing, Defining Cloud Computing, Definition of Cloud computing, Cloud Computing Is a Service, Cloud Computing Is a Platform, Principles of Cloud computing, Five Essential Characteristics, Four Cloud Deployment Models

**UNIT - III**

Cloud Computing Architecture and Management: Cloud architecture, Layer, Anatomy of the Cloud, Network Connectivity in Cloud Computing, Applications, on the Cloud, Managing the Cloud, Managing the Cloud Infrastructure Managing the Cloud application, Migrating Application to Cloud, Phases of Cloud Migration Approaches for Cloud Migration.

**UNIT - IV**

Cloud Service Models: Infrastructure as a Service, Characteristics of IaaS, Suitability of IaaS, Pros and Cons of IaaS, Summary of IaaS Providers, Platform as a Service. Characteristics of PaaS, Suitability of PaaS, Pros and Cons of PaaS, Summary of PaaS Providers, Software as a Service, Characteristics of SaaS, Suitability of SaaS, Pros and Cons of SaaS, Summary of SaaS Providers, Other Cloud Service Models.

**UNIT-V**

Cloud Service Providers: EMC, EMC IT, Captiva Cloud Toolkit, Google, Cloud Platform, Cloud Storage, Google Cloud Connect, Google Cloud Print, Google App Engine, Amazon Web Services, Amazon Elastic Compute Cloud,

Amazon Simple Storage Service, Amazon Simple Queue Service, Microsoft, Windows Azure, Microsoft Assessment and Planning Toolkit, SharePoint, IBM, Cloud Models, IBM Smart Cloud, SAP Labs, SAP HANA Cloud Platform, Virtualization Services Provided by SAP, Sales force, Sales Cloud, Service Cloud: Knowledge as a Service, Rackspace, VMware, Manjrasoft, Aneka Platform

**TEXTBOOKS:**

1. Essentials of Cloud Computing: K. Chandrasekharan, CRC Press, 2014

**REFERENCE BOOKS:**

1. Cloud Computing: Principles and Paradigms by Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, Wiley, 2011.
2. Distributed and Cloud Computing, Kai Hwang, Geoffrey C. Fox, Jack J. Dongarra, Elsevier, 2012.
3. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Kumaraswamy, Shahed Latif, O'Reilly, SPD, 2011.

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II  
(2005PE08) CLOUD COMPUTING**

B.Tech. IV Year I Sem

L T P C

3 0 0 3

**COURSE OBJECTIVES:**

- This course provides an insight into cloud computing
- Topics covered include- distributed system models, different cloud service models, service-oriented architectures, cloud programming and software environments, resource management.

**Course Outcomes:**

- Ability to understand various service delivery models of a cloud computing architecture.
- Ability to understand the ways in which the cloud can be programmed and deployed.
- Understanding cloud service providers.

**UNIT - I**

Computing Paradigms: High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing, Bio computing, Mobile Computing, Quantum Computing, Optical Computing, Nanocomputing.

**UNIT - II**

Cloud Computing Fundamentals: Motivation for Cloud Computing, The Need for Cloud Computing, Defining Cloud Computing, Definition of Cloud computing, Cloud Computing Is a Service, Cloud Computing Is a Platform, Principles of Cloud computing, Five Essential Characteristics, Four Cloud Deployment Models

**UNIT - III**

Cloud Computing Architecture and Management: Cloud architecture, Layer, Anatomy of the Cloud, Network Connectivity in Cloud Computing, Applications, on the Cloud, Managing the Cloud, Managing the Cloud Infrastructure Managing the Cloud application, Migrating Application to Cloud, Phases of Cloud Migration Approaches for Cloud Migration.

**UNIT - IV**

Cloud Service Models: Infrastructure as a Service, Characteristics of IaaS, Suitability of IaaS, Pros and Cons of IaaS, Summary of IaaS Providers, Platform as a Service. Characteristics of PaaS, Suitability of PaaS, Pros and Cons of PaaS, Summary of PaaS Providers, Software as a Service, Characteristics of SaaS, Suitability of SaaS, Pros and Cons of SaaS, Summary of SaaS Providers, Other Cloud Service Models.

**UNIT - V**

Cloud Service Providers: EMC, EMC IT, Captiva Cloud Toolkit, Google, Cloud Platform, Cloud Storage, Google Cloud Connect, Google Cloud Print, Google App Engine, Amazon Web Services, Amazon Elastic Compute Cloud,



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**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II  
(2066PC63) DEEP LEARNING LAB****B.Tech. IV Year I Sem****L T P C****0 0 3 1.5**

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1. Classification with Multilayer Perceptron using Scikit-learn (MNIST Dataset)
2. Hyper-Parameter Tuning in Multilayer Perceptron
3. Implement RNN chosen dataset
4. Deep learning Packages Basics: Tensorflow, Keras, Theano and PyTorch
5. Classification of MNIST Dataset using CNN
6. Parameter Tuning in CNN
7. Dimensionality Reduction using Deep learning
8. Object detection using Transfer Learning of CNN architectures
9. Implement auto-encoder technique on chosen dataset
10. CASE STUDY 1:Sentiment Analysis using CNN

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**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**  
**PROFESSIONAL ELECTIVE - II**  
**(2066PC62) NATURAL LANGUAGE PROCESSING LAB**

B.Tech. IV Year I Sem

L T P C

0 0 3 1.5

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**PREREQUISITES:**

STUDENTS SHOULD HAVE HANDS ON

- NLTK
- COLAB/JUPITER/SPIDER

**LIST OF EXPERMENTS**

1. Study on Pride and Prejudice:

Word Tokens, Collocations, Concordance, Dispersion

2. Perform the following task:

- Choose some book-length document and download it.
- Count its characters, lines and words.

3. Perform the following task

- Count sentences, vocabulary, and the like.

4. Perform the following task

- Show collocations, common context, concordance, and similar relationships among the words

5. Perform the following task

- Plot a lexical dispersion or two.

6. Perform the following task

- Plot a frequency distribution of the most common words.

7. Perform NLP text-preprocessing (tokenization) with NLTK

8. Perform NLP text-preprocessing (stemming) with NLTK

9. CASE STUDY 1: Semantics analysis

10. CASE STUDY 2: Sentiment analysis

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II****(2005PE05) PATTERN RECOGNITION**

B.Tech. IV Year II Sem

L T P C

3 0 0 3

**COURSE OBJECTIVES:**

- To implement pattern recognition and machine learning theories
- To design and implement certain important pattern recognition techniques
- To apply the pattern recognition theories to applications of interest
- To implement the entropy minimization, clustering transformation and feature ordering

**Course Outcomes**

- Design systems and algorithms for pattern recognition (signal classification), with focus on sequences of patterns that are analyzed using, e.g., hidden Markov models (HMM)
- Analyze classification problems probabilistically and estimate classifier performance,
- Understand and analyze methods for automatic training of classification systems,
- Apply Maximum-likelihood parameter estimation in relatively complex probabilistic models, such as mixture density models and hidden Markov models
- Understand the principles of Bayesian parameter estimation and apply them in relatively simple probabilistic models

**UNIT-I:**

**Introduction** - Basic concepts, Applications, Fundamental problems in pattern Recognition system design, Design concepts and methodologies, Examples of Automatic Pattern recognition systems, Simple pattern recognition model, Decision and Distance

Functions - Linear and generalized decision functions, Pattern space and weight space, Geometrical properties, implementations of decision functions, Minimum-distance pattern classifications.

**UNIT-II:**

**Probability**- Probability of events, Random variables, Joint distributions and densities, Movements of random variables, Estimation of parameter from samples, Statistical Decision Making - Introduction, Baye's theorem, Multiple features, Conditionally independent features, Decision boundaries, Unequal cost of error, estimation of error rates, the leaving-one-out techniques, characteristic curves, estimating the composition of populations. Baye's classifier for normal patterns.

**UNIT-III:** Non Parametric Decision Making - Introduction, histogram, kernel and window estimation, nearest neighbor classification techniques. Adaptive decision boundaries, adaptive discriminate functions, Minimum squared

error, Discriminate functions, choosing a decision making techniques. Clustering and Partitioning -Hierarchical Clustering: Introduction, agglomerative clustering algorithm, the single-linkage, complete-linkage and average-linkage algorithm. Ward's method Partition clustering-Forg's algorithm, K-means's algorithm, Isodata algorithm.

UNIT-IV:

**Pattern Preprocessing and Feature Selection:** Introduction, distance measures, clustering transformation and feature ordering, clustering in feature selection through entropy minimization, features selection through orthogonal expansion, binary feature selection.

UNIT-V:

**Syntactic Pattern Recognition & Application Of Pattern Recognition:** Introduction, concepts from formal language theory, formulation of syntactic pattern recognition problem, syntactic pattern description, recognition grammars, automata as pattern recognizers, Application of pattern recognition techniques in bio-metric, facial recognition, IRIS scan, Finger prints, etc.,

**TEXT BOOKS:**

1. Gose. Johnsonbaugh. Jost. " Pattern recognition and Image Analysis", PHI. Tou. Rafael. Gonzalez. "Pattern Recognition Principle", Pearson Education

**REFERENCE BOOK:**

1. Richard Duda, Hart., David Stork, "Pattern Classification", John Wiley

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II  
(2012PE05) BIG DATA ANALYTICS**

B.Tech. IV Year II Sem

L T P C

3 0 0 3

**COURSE OBJECTIVES:**

- To understand about big data
- To learn the analytics of Big Data
- To understand the MapReduce fundamentals

**Course Outcomes:**

- Preparing for data summarization, query, and analysis.
- Applying data modeling techniques to large datasets
- Creating applications for Big Data analytics
- Building a complete business data analytics solution

**UNIT-I****INTRODUCTION TO BIG DATA AND ANALYTICS**

**Classification of Digital Data, Structured and Unstructured Data** - Introduction to Big Data: Characteristics - Evolution - Definition - Challenges with Big Data -

Other Characteristics of Data - Why Big Data - Traditional Business Intelligence versus Big Data -

Data Warehouse and Hadoop Environment Big Data Analytics: Classification of Analytics - Challenges - Big Data Analytics important - Data Science - Data Scientist - Terminologies used in Big Data Environments - Basically Available Soft State Eventual Consistency - Top Analytics Tools

**UNIT-II****INTRODUCTION TO TECHNOLOGY LANDSCAPE**

NoSQL, Comparison of SQL and NoSQL, Hadoop - RDBMS Versus Hadoop - Distributed Computing Challenges - Hadoop Overview - Hadoop Distributed File System - Processing Data with Hadoop - Managing Resources and Applications with Hadoop YARN - Interacting with Hadoop Ecosystem

**UNIT-III****INTRODUCTION TO MONGODB AND CASSANDRA**

MongoDB: Why Mongo DB - Terms used in RDBMS and Mongo DB - Data Types - MongoDB Query Language Cassandra: Features - CQL Data Types - CQLSH - Keyspaces - CRUD Operations - Collections - Using a Counter - Time to Live - Alter Commands - Import and Export - Querying System Tables.

**UNIT IV****INTRODUCTION TO MAPREDUCE PROGRAMMING AND HIVE**

MapReduce: Mapper-Reducer-Combiner-Partitioner-Searching-Sorting-Compression Hive: Introduction - Architecture - Data Types - File Formats - Hive Query Language Statements-Partitions-Bucketing-Views-Sub-Query-Joins-Aggregations-Groupby and Having-RCFile Implementation-Hive User Defined Function-Serialization and Deserialization-Hive Analytic Functions

**UNIT V****INTRODUCTION TO PIG & JASPER REPORTS**

Pig: Introduction-Anatomy-Features-Philosophy-Use Case for Pig-Pig Latin Overview - Pig Primitive Data Types - Running Pig - Execution Modes of Pig - HDFS Commands - Relational Operators - Eval Function - Complex Data Types - Piggy Bank - User-Defined

Functions - Parameter Substitution - Diagnostic Operator - Word Count Example using Pig - Pig at Yahoo! - Pig Versus Hive-Jasper Report using JasperSoft.

**TEXTBOOK:**

1. Seema Acharya, Subhashini Chellappan, "Big Data and Analytics", Wiley Publications, First Edition, 2015

**REFERENCE BOOKS:**

1. Judith Hurwitz, Alan Nugent, Fern Halper, Marcia Kaufman, "Big Data for Dummies", John Wiley & Sons, Inc. (2013)
2. Tom White, "Hadoop The Definitive Guide", O'Reilly Publications, Fourth Edition, 2015
3. Dirk Der-ooos, Paul C. Zikopoulos, Roman B. Melnyk, Bruce Brown, Rafael Coss, "Hadoop For Dummies", Wiley Publications, 2014
4. Robert D. Schneider, "Hadoop For Dummies", John Wiley & Sons, Inc. (2012)
5. Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data", McGraw Hill, 2012  
Chuck Lam, "Hadoop In Action", Dreamtech Publications, 2010.

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II****(2005PE20) DISTRIBUTED SYSTEMS****B.Tech. IV Year II Sem****L T P C****3 0 0 3****COURSE OBJECTIVES:**

- To learn the principles, architectures, algorithms and programming models used in distributed systems.
- To examine state-of-the-art distributed systems, such as Google File System.
- To design and implement sample distributed systems.

**Course Outcomes:**

- Students will identify the core concepts of distributed systems: the way in which several machines orchestrate to correctly solve problems in an efficient, reliable and scalable way.
- Students will examine how existing systems have applied the concepts of distributed systems in designing large systems, and will additionally apply these concepts to develop sample systems.

**UNIT I**

Characterization of Distributed Systems: Introduction, Examples of Distributed systems, Resource sharing and web, challenges.

System models: Introduction, Architectural and Fundamental models, networking and Internetworking.

**UNIT II**

Time and Global States: Introduction, Clocks, events and Process states, Synchronizing physical clocks, logical time and logical clocks, global States.

Coordination and Agreement: Introduction, Distributed mutual exclusion, Elections, Multicast communication, consensus and related problems.

**UNIT III**

Inter process Communication: Introduction, The API for the Internet Protocols, External Data Representation and Marshalling, Client -Server Communication, Group Communication, Case Study: IPC in UNIX.

Distributed Objects and Remote Invocation: Introduction, Communication between distributed objects, Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI.

**UNIT IV**

Distributed File Systems: Introduction, File Service Architecture, Case Study: Sun Network File System

Name Services: Name Services: Introduction, Name Services and the Domain Name System, Case study of the Global Name Service

Distributed Shared Memory: Introduction, Design and Implementation issues, Sequential consistency, Release

consistency, Other consistency models.

#### **UNIT V**

Transactions and Concurrency control: Introduction, Transactions, Nested Transactions, Locks, optimistic concurrency control, Timestamp ordering, Comparison of methods for concurrency control.

Distributed Transactions: Distributed Transactions: Introduction, Flat and Nested Distributed Transactions, Atomic commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery.

#### **TEXT BOOKS:**

1. Distributed Systems Concepts and Design, G Coulouris, J Dollimore and T Kindberg, Fourth Edition, Pearson Education. 2009.

#### **REFERENCES:**

1. Distributed Systems, Principles and paradigms, Andrew S.Tanenbaum, Maarten Van Steen, Second Edition,PHI.
2. Distributed Systems, An Algorithm Approach, Sikumar Ghosh, Chapman & Hall/CRC, Taylor &Fransis Group,2007.



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**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN****PROFESSIONAL ELECTIVE - II****(2005PE21) GAME PROGRAMMING****B.Tech. IV Year II Sem****L T P C****3 0 0 3**

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**COURSE OBJECTIVES:**

The student should be made to:

- Understand the concepts of Game design and development.
- Learn the processes, mechanics and issues in Game Design.
- Be exposed to the Core architectures of Game Programming.
- Know about Game programming platforms, frame works and engines.
- Learn to develop games.

**Course Outcomes:**

Upon completion of the course, students will be able to

- Discuss the concepts of Game design and development.
- Design the processes, and use mechanics for game development.
- Explain the Core architectures of Game Programming.
- Use Game programming platforms, frame works and engines.
- Create interactive Games.

**UNIT I : 3D GRAPHICS FOR GAME PROGRAMMING**

3D Transformations, Quaternions, 3D Modeling and Rendering, Ray Tracing, Shader Models, Lighting, Color, Texturing, Camera and Projections, Culling and Clipping, Character Animation, Physics-based Simulation, Scene Graphs.

**UNIT II : GAME ENGINE DESIGN**

Game engine architecture, Engine support systems, Resources and File systems, Game loop and real-time simulation, Human Interface devices, Collision and rigid body dynamics, Game profiling.

**UNIT III : GAME PROGRAMMING**

Application layer, Game logic, Game views, managing memory, controlling the main loop, loading and caching game data, User Interface management, Game event management.

**UNIT IV: Coding Tidbits and Style That Saved Me**

General Coding Styles, Bracing, Consistency, Smart Code Design Practices, Avoiding Hidden Code and Nontrivial Operations, Class Hierarchies: Keep Them Flat, Inheritance Versus Composition Virtual Functions GoneBad, Use

Interface Classes, Consider Using Factories, Encapsulate Components That Change, Use Streams to Initialize Objects, Smart Pointers and Naked Pointers.

#### **UNIT V: Building Your Game :**

ALittleMotivation, CreatingaProject, BuildConfigurations, CreateaBullet-ProofDirectoryStructure, WheretoputYourGameEngineandTools, SettingVisualStudioBuildOptions, MultiplatformProjects.

#### **TEXT BOOKS:**

1. Mike Mc Shaffrky and David Graham, "Game Coding Complete", Fourth Edition, Cengage Learning, PTR, 2012.
2. Jason Gregory, "Game Engine Architecture", CRC Press / A K Peters, 2009.
3. David H. Eberly, "3D Game Engine Design, Second Edition: A Practical Approach to Real-Time Computer Graphics" 2nd Editions, Morgan Kaufmann, 2006.

#### **REFERENCES:**

1. Ernest Adams and Andrew Rollings, "Fundamentals of Game Design", 2nd Edition Prentice Hall / New Riders, 2009.
2. Eric Lengyel, "Mathematics for 3D Game Programming and Computer Graphics", 3rd Edition, Course Technology PTR, 2011.
3. Jesse Schell, The Art of Game Design: A book of lenses, 1st Edition, CRC Press, 2008.

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**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**  
**PROFESSIONAL ELECTIVE - II**  
**(2012PE06) DISTRIBUTED TRUST AND BLOCKCHAIN TECHNOLOGY**

B.Tech. IV Year II Sem

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3 0 0 3

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**COURSE OBJECTIVES:**

- Understand how blockchain systems (mainly Bitcoin and Ethereum) work,
- To securely interact with them,
- Design, build, and deploy smart contracts and distributed applications,
- Integrate ideas from blockchain technology into their own projects.

**COURSE OUTCOMES:**

- Explain design principles of Bitcoin and Ethereum.
- Explain Nakamoto consensus.
- Explain the Simplified Payment Verification protocol.
- List and describe differences between proof-of-work and proof-of-stake consensus.
- Interact with a blockchain system by sending and reading transactions.
- Design, build, and deploy a distributed application.
- Evaluate security, privacy, and efficiency of a given blockchain system.

**UNIT I:**

**BASICS:**

Distributed Database, Two General Problem, Byzantine General problem and Fault Tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete.-Cryptography: Hash function, Digital Signature-ECDSA, Memory Hard Algorithm, Zero Knowledge Proof.

**UNIT II:**

**BLOCKCHAIN:**

Introduction, Advantage over conventional distributed database, Blockchain Network, Mining Mechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit, Transactions and Fee, Anonymity, Reward, Chain Policy, Life of Blockchain application, Soft & Hard Fork, Private and Public blockchain.

**UNIT III:**

**DISTRIBUTED CONSENSUS:**

Nakamoto consensus, Proof of Work, Proof of Stake, Proof of Burn, Difficulty Level,

SybilAttack,Energyutilizationandalternate.

#### UNIT IV:

##### CRYPTOCURRENCY:

History, Distributed Ledger, Bitcoin protocols - Mining strategy and rewards, Ethereum - Construction,DAO,SmartContract,GHOST,Vulnerability,Attacks,Sidechain,Namecoin

#### UNIT V:

##### CRYPTOCURRENCYREGULATION:

Stakeholders,RootsofBitcoin,LegalAspects-CryptocurrencyExchange,BlackMarket andGlobalEconomy.

Applications:CloudComputing,MedicalRecordManagementSystem,DomainNameServiceandfutureofBlockchain.

##### TEXTBOOKS:

1. Arvind Narayanan,Joseph Bonneau,EdwardFelten,AndrewMillerandStevenGoldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction,PrincetonUniversityPress (July19,2016).
2. The Block chain for Beginners -Guide to Block chain and Leveraging Block chain-ProgrammingbyJoshThompsons, createspaceIndependentPublishingplatform,2017.

##### REFERENCEBOOKS:

1. Antonopoulos,MasteringBitcoin:UnlockingDigitalCryptocurrencies
2. Block Chain Technology, Cryptocurrency and Applications. By S.Shukla,M.Dhawan,S.Sharma,S.Venkatesan,Oxford University-Press2019.
3. SatoshiNakamoto,Bitcoin:APeer-to-PeerElectronicCashSystem
4. DR.GavinWood,"ETHEREUM:ASecureDecentralizedTransactionLedger,"Yellowpaper.2014.
5. NicolaAtzei,MassimoBartoletti,andTizianaCimoli,AsurveyofattacksonEthereumsmart contracts

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**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**  
**PROFESSIONAL ELECTIVE - II**  
**(2005PE12) INTERNET OF THINGS**

B.Tech. IV Year II Sem

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**COURSE OBJECTIVES:**

- To introduce the terminology, technology and its applications.
- To explain the concept of M2M (machine to machine) with necessary protocols
- To introduce the Python Scripting Language which is used in many IoT devices
- To elucidate the Raspberry Pi platform, that is widely used in IoT applications
- To explain the implementation of web-based services on IoT devices

**Course Outcomes:**

Upon completion of this course, students should be able to:

- Explain the importance and usage of IoT.
- Describe the various IoT levels and protocols.
- Develop programs in Python.
- Illustrate the functioning of IoT devices.
- Relate IoT to cloud computing and web applications.

**UNIT I**

Introduction to Internet of Things - Definition and Characteristics of IoT,

Physical Design of IoT - IoT Protocols, IoT communication models, IoT Communication APIs IoT enabled Technologies - Wireless Sensor Networks, Cloud Computing, Bigdata analytics, Communication protocols, Embedded Systems, IoT Levels and Templates Domain Specific IoTs - Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle

**UNIT II**

IoT and M2M - Software defined networks, network function virtualization, difference between SDN and NFV for IoT

Basics of IoT System Management with NETCOZF, YANG-NETCONF, YANG, SNMP, NETOPEER

**UNIT III**

Introduction to Python - Language features of Python, Datatypes, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling

Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib

**UNIT IV**

IoT Physical Devices and Endpoints-Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming-Python program with Raspberry PI with focus of interfacing external gadgets, controlling output and reading input from pins.

**UNIT V**

IoT Physical Servers and Cloud Offerings-Introduction to Cloud Storage models and communication APIs  
Webserver-Webserver for IoT, Cloud for IoT, Python web application framework Designing a RESTful web API.

**TEXTBOOK:**

1. Internet of Things-A Hands-on Approach, Arshdeep Bhaga and Vijay Madiseti, Universities Press, 2015, ISBN : 9788173719547
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759.