MALLA REDDY ENGINEERING COLLEGE (Autonomous)

COURSE STRUCTURE – B.Tech. COMPUTER SCIENCE AND ENGINEERING

(Choice Based Credit System)

(MR17 Regulations - Effective from Academic Year 2017-18 onwards)

I SEMESTER

S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	HS	70H01	English	3	-	-	3	40	60	100
2	BS	70B01	Engineering Mathematics	3	2	-	4	40	60	100
3	BS	70B06	Engineering Physics	4	-	-	4	40	60	100
4	ES	70501	Computer Programming	2	2	-	3	40	60	100
5	ES	70301	Engineering Graphics	4	-	-	4	40	60	100
6	HS	70H02	English Language Lab	-	-	4	2	40	60	100
7	BS	70B07	Engineering Physics Lab	-	-	4	2	40	60	100
8	ES	70502	Computer Programming lab	-	-	4	2	40	60	100
9	AC	70A01	NSS & Sports/Yoga	-	-	2	-	-	-	-
Total				16	4	14	24	**Contact Periods: 34**		

II SEMESTER

S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	BS	70B02	Computational Mathematics	3	2	-	4	40	60	100
2	BS	70B08	Applied Physics	3	-	-	3	40	60	100
3	BS	70B10	Applied Chemistry	4	-	-	4	40	60	100
4	ES	70201	Basic Electrical and Electronics Engineering	3	-	-	3	40	60	100
5	ES	70503	Data Structures	4	-	-	4	40	60	100
6	BS	70B11	Applied Chemistry Lab	-	-	4	2	40	60	100
7	ES	70504	Data Structures lab	-	-	4	2	40	60	100
8	ES	70303	Engineering Workshop	-	-	4	2	40	60	100
9	MC	70M01	Computational Mathematics Lab	-	-	3	-	40	60	100
Total				17	2	15	24	**Contact Periods: 34**		

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70H01	English (Common for CE,EEE,ME,ECE,CSE,IT and Mi.E)	L	T	P
Credits: 3		3	-	-

Course Objective:

The objective of this course is to improve the English Language competency of the students, which emphasizes on all language components namely grammar, vocabulary, prose, short stories. Further, it also helps in developing the skills of Reading and Writing. As a result students are equipped to study the academic subjects more effectively using the theoretical and practical components of the English syllabus.

Module – I: Chapter entitled **Minimalism- Live a Meaningful Life** from **Effective English,** Maruthi Publications.

Poem **: Road Not Taken** by **Robert Frost**
Vocabulary **:** Formation of words, prefixes, suffixes and root words
Grammar **:** Article and Prepositions
Reading **:** Skimming and Scanning
Writing **:** Introduction to writing skills, characteristics of effective writing

Module - II: Chapter entitled **Knowledge Society** from **Effective English,** Maruthi Publications.

Poem **: Life** by Sarojini Naidu
Vocabulary **:** Homonyms, homophones, homographs
Grammar **:** Sentence Structures, Voice – exercises
Reading **:** Intensive Reading and Extensive Reading
Writing **:** Paragraph writing- use of cohesive devices; arranging jumbled sentences into Paragraph

Module-III: Chapter entitled **Half a Rupee Worth** from **Effective English,** Maruthi Publications.

Poem **: If** by **Rudyard Kipling**
Grammar **:** Tense, aspect and concord
Vocabulary **:** Idiomatic Expressions; Phrasal Verbs
Reading **:** Reading for theme and gist.
Writing **:** Essay Writing

Module - IV: Chapters entitled **Jesse Owens** from **Effective English,** Maruthi Publications.

Poem **: I too Sing America** by **Langston Hughes**
Grammar **:** Question Tags; Degrees of Comparison
Vocabulary **:** One word substitutions; synonyms and antonyms
Reading **:** Reading for interpretation
Writing **:** Letter writing- both formal and informal

Module-V: Chapter entitled **Pecuniary Independence** from **Effective English,** Maruthi Publications.

Poem **: Human Family** by **Maya Angelou**

Grammar **:** Direct and Indirect Speech
Vocabulary **:** Gender sensitive language, integrated exercises in vocabulary
Reading **:** Reading for specific purposes
Writing **:** Summarizing
* Exercises from the texts not prescribed shall also be used for classroom tasks.

Course Outcomes:
After completion of the course, students will be able to:

1. Use English considerably well in written and spoken.
2. Enrich language accurately and fluently.
3. Employ extensive and intensive reading skills
4. Gain confidence in using English language and skills for writing in real life situations.
5. Use standard grammar, punctuation, and spelling in documents.

Text Books:

Effective English, Hyderabad: Maruthi Publications, 2017.

For Grammar practice:

1. Sudha Rani Et all, *A Work Book on English Grammar and Composition***,** New Delhi: Tata Mac Graw –Hill, , 2nd Edition, 2012.

Reference Books:

1. Azar, Betty and Stacy A, Hagen**,** *Understanding and Using English Grammar*, Foundation Books, 4th Edition, 2009.
2. Chaudhuri, Santanu Sinha, *Learn English: A Fun Book of Functional Language***,** *Grammar and Vocabulary*,New Delhi: Tata McGraw Hill Education, , Paper Back Edition. 2013.
3. Eastwod, John: *Oxford Guide to English Grammar*, Oxford University Press, 4th Edition, 1994.
4. Field, Marion**,** *Improve Your Written English*, Kindle books, 5th Edition, 2009.
5. G. Leech and J. Svartvik ,*A Communicative Grammar of English*, London: Longman, 3rd Edition, 2002.

Related Websites:

1. http://www.slideshare.net/aszardini/word-formationroot-words-prefixes-and-suffixes
2. http://www.scribd.com/doc/37085980/Circulars-Circular-Letters-Notices-Memo#scribd.
3. http://www.zsme.tarnow.pl/jezykiobce/wp-content/uploads/2013/11/writing-letters1.pdf.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70B01	Engineering Mathematics	L	T	P
Credits: 4	(Common for CE, EEE, ME, ECE, CSE, IT and Mi.E.)	3	2	-

Pre-requisite: Basics of Matrices & Basic differentiation and integration.

Course Objectives:

The objective of this course is to familiarize the students with linear algebra and elements of mathematics. Differential equations play a major role in understanding many processes and systems that are of interest to the engineers in a generic sense. An in-depth understanding of the ordinary and higher order differential equation are an absolutely essential part of the tool-kit of a well trained engineer. This course fills into this perceived need. The treatment should be informed by the fact that not only conceptual but also and in some cases, more importantly numerical or computational methods are of essence. This is specially designed for students to help them bring to speed with other students who have already had some training in mathematics at the 12th Standard level.

Module – I: Matrices and Linear systems of equations [12 Periods]

Rank of the matrix - Elementary transformations –Echelon form – Normal form – PAQ Form - Inverse of a Matrix by applying Elementary transformations.

Solution of Linear Systems – Consistency of linear system of equations – Gauss elimination method – LU-Decomposition method –Solution of Tri-diagonal Systems (Thomas Algorithm).

Module – II: Eigen Values & Eigen Vectors [12 Periods]

Linear transformation - Eigen values - Eigen vectors – properties – Linearly independent and dependent vectors - Cayley-Hamilton Theorem (without Proof) - Inverse and powers of a matrix by Cayley-Hamilton theorem.

Diagonolization of matrix-Calculation of powers of matrix,– Modal and spectral matrices. Real matrices – Symmetric - skew – symmetric -Orthogonal Matrix. Similarity Transformation - Orthogonal Transformation. Quadratic forms

Module – III: Differential Equations of first order and first degree [12 Periods]

A: Formation of Differential Equations - Solutions of First order Differential Equations: Homogeneous - Non-homogeneous – Exact - Non-exact.

B:Leibnitz's Linear Equation - Bernoulli's Differential Equation. Applications of First Order Differential Equations: Orthogonal trajectories - Newton's Law of cooling - Law of natural growth and decay.

Module – IV: Differential Equations of Second & Higher Order [12 Periods]

Rules for finding Complementary function-Particular integral (Non-homogeneous term of the type e^{ax} , $Sin\, bx$ / $Cos\, bx$, $x^n, e^{ax}V(x), x^nV(x) only$)

Method of variation of parameters.Equations reducible to constant coefficients - Cauchy - Euler and Legendre's differential equations.

Module –V: Laplace Transforms [12 Periods]

Definition of Laplace transform, Condition for existence, Laplace transform of standard functions, Properties of Laplace transform, Laplace transform of function when they are multiplied or divided by 't' , Evaluation of Integrals by using Laplace transforms.

InverseLaplace transforms: Finding inverseLaplace transforms using partial fractions, first shifting theorem, Inverse Laplace transforms of derivatives, Convolution theorem, Dirac's delta

function, Unit step function. Application of Laplace transforms to ordinary differential equations.

Text Books:

1. Kreyszig, **"Advanced Engineering Mathematics"**, John Wiley & Sons Publishers, 10th Edition, Reprint 2010.
2. B.S. Grewal, Khanna, **"Higher Engineering Mathematics",** Publishers, 43rd Edition, Reprint 2011.

References:

1. Richard Bellman,**"Introduction to Matrix Analysis"**, Dover Publications, 2nd Edition, 1970.
2. R.K. Jain & S.R.K. Iyengar, **"Advanced Engineering Mathematics"** 3rd edition, Narosa Pub. House, Delhi.
3. Kanti B.Datta, **"Mathematical Methods of Science and Engineering"**, Cengage Learning
4. Alan Jeffrey, **"Mathematics for Engineers and Scientists"**, 6ht Edi, 2013, Chapman & Hall/ CRC.

E Resources:

a. **Concerned Website links**

1. http://home.scarlet.be/math/stelsels.htm (Systems of linear equations, matrices)
2. https://www.math.ust.hk/~machas/differential-equations.pdf (Differential equations)
3. HTTP://WWW.MATH.PSU.EDU/SHEN_W/250/NOTESLAPLACE.PDF (LAPLACE TRANSFORM)

b. **Concerned Journals/Magazines links**

1. https://globaljournals.org/GJCST_Volume15/4-System-of-Linear-Equations.pdf(Matrices)
2. http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=6541959 (Differential Equations of first order and first degree)
3. https://www.ijsr.net/archive/v2i1/IJSRON2013331.pdf (Laplace transforms)

c. **NPTEL Videos**

1. http://nptel.ac.in/courses/122107036/32 (Matrices by Prof Sunita Gakkhar)
2. http://nptel.ac.in/courses/122107037/20 (Differential Equations of first order and first degree)
3. http://nptel.ac.in/courses/122107037/14 (Differential Equations of Second & Higher Order)
4. https://www.youtube.com/watch?v=DPg5T-YBQjU (Laplace transforms)

Course Outcomes:

After completion of this course, students will be able to:

1. Apply the operations on Matrices like Row, Column operations, Rank of the Matrix and Able to check the Consistency and Inconsistency of the system of equations.
2. Find the Eigen values and Eigen vectors of the given Matrix to analyze the associated Spectral matrix. Application of Cayley –Hamilton theorem.
3. Solve the first order first degree Differential equations and its applications
4. Understand higher order ordinary differential equations and apply them in Bending of Beams and circuit problems.
5. Understand Laplace Transforms and perform its applications to linear differential equations and real time applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70B06	Engineering Physics (Common for CE,EEE,ME,ECE,CSE,IT and Mi.E.)	L	T	P
Credits: 4		4	-	-

Prerequisites: NIL

Course Objective:

The main objective of this course is to provide an adequate exposure and develop insight about the basic principles of physics along with the possible applications

Module-I: Optics [9 Periods]

Principle of superposition, Coherence–Spatial and Temporal; Introduction to Interference, Young's double slit experiment - Optical path difference and Fringe width; Interference in thin films (Reflected light) Cosine law; Newton's rings experiment - Determination of wavelength of light. Concept of diffraction, Diffraction grating – resolving power.

Module–II: Waves and Oscillations [9 Periods]

Introduction, Differential equation for SHM and its solution; expression for energy of the oscillator; superposition of two linear SHMs (with same frequencies) - Lissajous figures; Damped vibrations - differential equation and its solution, Critical damping, under damping and over damping; Qualitative treatment of Forced vibrations, sharpness of resonance, analogy between mechanical and electrical oscillators.

Module–III: A. Crystal Structures [7 Periods]

Space lattice**,** crystallographic axes, Unit cell, Lattice parameters; Crystal systems, Bravais lattices, Miller indices, Crystal planes and directions, Inter-planar spacing of orthogonal crystal systems, Atomic radius, Coordination number and atomic packing fraction of SC, BCC and FCC lattices, Diamond, ZnS and NaCl structures.

B. X-ray Diffraction [4 Periods]

Introduction, Bragg's law, Laue and Powder methods, Application of XRD to analyze Cubic structure.

Module–IV: Principles of Quantum Mechanics [8 Periods]

Postulates of Quantum mechanics, Louis de Broglie's concept of matter waves, Davisson and Germer's experiment, Heisenberg's Uncertainty Principle, Schrödinger'sTime dependent and Independent Wave Equation; Physical Significance and properties of the Wave Function; Energy of a particle inOne Dimensional infinite Potential well.

Module–V: Nano materials [8 Periods]

Introduction - Nano scale, Surface to volume ratio and Quantum confinement; Optical properties, Electrical properties; brief description of different methods of synthesis of nano materials - physical (LASER ablation, Ball milling), chemical (Vapor deposition, Sol - gel); Carbon nano-tubes - properties and applications**,** Applications of nano materials - automobiles, electronics, medical, cosmetics, textile.

Course Outcomes:

After completion of the course, student will be able to:

1. be aware of the concepts of Interference, diffraction and its applications.

2. distinguish free, damped and forced vibrations, cevelop basic knowledge on the distribution functions and simple applications
3. apply the basic principles of crystals and analysis of crystal structures using X-ray diffraction.
4. acquire the theoretical information about matter in terms of quantum physics
5. analyze and apply various synthesis methods of nano materials and different applications.

Text Books:

1. K Vijaya Kumar, S Chandralingam, "**Modern Engineering Physics**'' Volume I & II, S. Chand, 1st Edition, 2017.
2. M N Avadhanulu, P G Kshirsagar, " **A Textbook of Engineering Physics"**, Revised Edition 2014

Reference Books:

1. P K Palanisamy, **"Engineering Physics"**, SciTech Publication, 4th Edition, 2014.
2. B K Pandey and S. Chaturvedi, "**Engineering Physics**" Cengage Learning India Revised Edition, 2014.
3. R K Gaur and SL Gupta, "**Engineering Physics**" DhanpatRai Publications, Eighth Revised Edition, 2006.
4. D K Bhattacharya, Poonam Tandon, "**Engineering Physics**", Oxford University Press, 1st Edition, 2015.

E-Resources:

1. https://www.researchgate.net/publication/259574083_Lecture_Notes_on_Engineering_Physics
2. https://www.researchgate.net/publication/292607115_Applied_Physics

Journals:

1. http://www.springer.com/physics/theoretical%2C+mathematical+%26+computational+physics/journal/40094
2. http://www.springer.com/physics/journal/340

NPTEL Videos:

1. https://www.youtube.com/watch?v=jnjjWI1s9_s&list=PLzJaFd3A7DZse2tQ2qUFChSiCj7jBidO0
2. https://www.youtube.com/watch?v=4a0FbQdH3dY

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70501	Computer Programming (Common for CE, EEE, ME, ECE, CSE, IT and Mi.E)	L	T	P
Credits: 3		2	2	-

Prerequisites: NIL

Course Objectives:
This course provides the fundamental concepts of computers and introduce to the students to the field of programming using C language, apply the control structures, iterations statements, arrays, functions, strings, pointers, structures, unions and files. This course also explains the concepts of searching and sorting techniques in C language.

Module I: Fundamentals and Introduction to C Language

A: Fundamentals **[04 Periods]**

Hardware, Software, Programming languages, Number Systems, Translators, Introduction to Operating System, Program Development steps - Algorithm, Flow charts.

B: Introduction to C Language **[07 Periods]**

History, Simple C Program, Identifiers, Preprocessor Directives- Include and define, Basic data types, User-defined data types, Variables, Constants, Type qualifiers, Managing Input / Output, Operators, Precedence and Associativity, Expression Evaluation, Type conversions, Simple C Programming examples.

Module II: Control Statements & Arrays

A: Control Statements **[04 Periods]**

Conditional statements- if and switch statements, ternary operator ?: , Loop Control Statements – while, for, do-while, break, continue and goto statements.

B: Arrays **[05 Periods]**

Basic concepts, One-dimensional arrays, Two–dimensional arrays, Multi-dimensional arrays.

Module III: Strings & Pointers

A: Strings **[04 Periods]**

Basic concepts, String Input / Output functions, Arrays of strings, String handling functions.

B: Pointers **[05 Periods]**

Basic concepts, Pointer arithmetic, Pointers and strings, Pointers and arrays, Dynamic Memory Allocation.

Module IV: Functions & Derived types

A: Functions **[05 Periods]**

Basics, User defined functions, Inter function communication, Library functions, Storage Classes-auto, register, static, extern, Scope rules, Array and string manipulations using functions, Recursive functions, Pointers and functions.

B: Derived types **[04 Periods]**

Structures – Basic concepts, Nested structures, Arrays of structures, Structure manipulations using functions, Pointers to structures, Self-referential structures, Unions, bit fields

Module V: File I/O, Sorting and Searching

A: File I/O **[04 Periods]**

Basic concepts, Text files and Binary files, File input / output operations, File status functions (error handling), Command-Line Arguments, C programming examples.

B: Sorting and Searching **[06 Periods]**

Sorting - selection sort, bubble sort, insertion sort, Searching - linear and binary searching methods.

Text Books:

1. PradipDey, Manas Ghosh, **"Programming in C**", Oxford University Press, 2nd Edition, 2011.
2. E. Balagurusamy, "**Computer Programming in C"**, Tata McGraw Hill, 1st Edition, 2013.

References:

1. Brian W. Kernighan, Dennis M. Ritchie, "**The C Programming Language"**, PHI, 2nd Edition, 1990.
2. Greg Perry and Dean Miller, "**C ProgrammingAbsolute beginner's guide**", QUE Publishers, 3rd Edition, 2013.
3. Paul Deitel and Harvey Deitel, "**C How to Program"**, PHI, 7th Edition, 2012.
4. Behrouz A. Forouzan, E.V.Prasad, Richard F. Gilberg, "**C programming: A Problem-Solving Approach**", Cengage Learning Press, 1st Edition, 2011.

E Resources:

a) Concerned Websites links:

1. http://oxford university press.ac.in/eBooks/ Programming in C.

b) Concerned Journals/Maximizes links:

1. https://www.journals.elsevier.com/science-of-computer-programming
2. http://www.ejournalofsciences.org

c) NPTEL Videos links:

1. http://onlinecourses.nptel.ac.in/iiitk_cs-101
2. http://onlinevideolecture.com/ebooks/?subject=C-Programming

Course Outcomes:

On the successful completion of the course, a student will be able to:

1. **Understand** the basic terminology, write, compile and debug programs in computer programming.
2. **Apply** different types of control structures and arrays in a computer programming.
3. **Develop** programs that make use of concepts such as strings and pointers in C language.
4. **Compare** parameter passing techniques, structures and unions in computer programming.
5. **Analyze** file operations, searching and sorting methods.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70301	ENGINEERING GRAPHICS (Common to CE,EEE,ME, ECE,CSE,IT and Mi.E)	L	T	P
Credits: 4		4	-	-

Pre-requisite: Nil

Course Objectives:
The students will be able to understand the manual drawings and getting fundamental knowledge on drafting software.

Module- I: Introduction to Engineering Drawing [15 Periods]
Principles of Engineering Graphics and their Significance. Lettering and dimensioning.
Geometrical Constructions: Regular polygons only.
Curves: Conic Sections including the Rectangular Hyperbola – General method only. Cycloid, Epicycloid, Hypocycloid and Involute.
Scales:Construction of different types of scales - Plain, Diagonal and Vernier scale.

Module- II: Projection of Points, Lines and Planes [15 Periods]
Principles of Orthographic Projections – Conventions – First Angle projections.
Points & Lines: Projection of Points, Projection of Lines- inclined to both the planes.
Planes: Projection of Planes – inclined to one plane only.

Module- III: Projection of Solids& Section of Solids [15 Periods]
Projection of Solids: Projections of regular solids like cube, prism, pyramid, tetrahedron, cylinder and cone by rotating object method. Axis inclined to both the reference planes.
Section of Solids: Sectioning of above solids in simple vertical position with the cutting plane is inclined to the one plane and perpendicular to the other –true shape of section.

Module- IV: Development of Surfaces & Isometric Projections [15 Periods]
Development of Surfaces: Development oflateral surfaces of simple and sectioned solids – prisms, pyramids cylinders and cones.
Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions –Plane Figures, Simple and Compound Solids.

Module-V: Transformation of Projections& Introduction AutoCAD [15 Periods]
Transformation of Projections: Conversion of Isometric Views to Orthographic Views. Conversion of orthographic views to isometric views – simple objects.
Introduction to Auto CAD: Introduction, Salient features of AutoCAD software**,** Basic commands, construction, editing and dimensioning, two dimensional drawings.

Text Books:

1. N. D. Bhat, "E**ngineering Drawing"**, Charotar Publishing House, 53rd Edition, 2014.
2. Basant Agrawal**, "Engineering Drawing"**, Tata McGraw Hill, 2nd Edition, 2013.

Reference Books:

1. K. L. Narayana, P. Kannaiah, "**Engineering Drawing"**, SciTech Publishers. 2nd Edition, 2013
2. K. Venugopal, "**Engineering Drawing"**, New Age International Publishers, 3rd Edition, 2014.
3. Trymbaka Murthy, "**Computer Aided Engineering Drawing"**, I.K. international Publishing House, 3rd Edition, 2011.
4. K. V. Natarajan, "**A text book of Engineering Graphics**", Dhanalakshmi Publishers, Chennai, 2015.
5. M.S. Kumar, "**Engineering Graphics**", D.D. Publications, 2011.

E Resources:

a) Concerned Website links

1. https://www.slideshare.net/search/slideshow?searchfrom=header&q=engineering+drawing
2. https://www.wiziq.com/tutorials/engineering-drawing
3. http://freevideolectures.com/Course/3420/Engineering-Drawing

b) Concerned Journals/Magazines links

1. http://www.worldcat.org/title/journal-of-engineering-graphics/oclc/1781711
2. http://road.issn.org/issn/2344-4681-journal-of-industrial-design-and-engineering-graphics-

c) NPTEL Videos

1. http://nptel.ac.in/courses/112103019/

Course Outcomes:

After completion of the course, students will be able to

1. Understand the basics of drawings and importance of curves.
2. Draw the projection of points, lines and planes.
3. Draw the projection of solids and section of solids.
4. Produce development of surface and isometric projections.
5. Convert orthographic views to isometric views and vice-versa and know the basics of Auto CAD.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70H02	English Language Lab (Common for CE,EEE,ME,ECE,CSE, IT and Mi.E)	L	T	P
Credits: 2		-	-	4

The Language Lab focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

Course Objective:

To sensitize the students to the intelligibility in their pronunciation of English, speech sounds, word accent, intonation and rhythm. It also helps to improve the fluency in spoken English and make them aware of nuances of major skills, *viz* listening and speaking skills. Hence it helps to train the students to understand nuances of both verbal and non verbal communication during all activities. The purpose of this course is to develop confidence levels of the students and to face the audience and participate in public speaking.

Listening Skills:

Objectives:

1. To enable students to develop their listening skill 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, awareness regarding 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 make students aware of the role of speaking in English and its contribution to their success.
2. To enable students to express themselves fluently and appropriately in social and professional contexts.

- Oral practice
- Describing objects/situations/people
- Just A Minute(JAM) Sessions.

Syllabus: English Language Communication Skills Lab shall have two parts:

a. Computer Assisted Language Learning (CALL) Lab

b. Interactive Communication Skills (ICS) Lab

The following course content is prescribed for the English Language Communication Skills Lab

Module - I:

CALL Lab: Introduction to Phonetics – Speech Sounds – Vowels and Consonants

ICS Lab: Ice-Breaking activity and JAM session

Listening: listening for sounds in context, for ideas.
Speaking: ideation and translation of ideas into sentences.

Module - II:

CALL Lab: Structure of Syllables - Past Tense Marker and Plural Marker – Weak Forms and Strong Forms -Consonant Clusters.

ICS Lab: Situational Dialogues – Role-Play- Expressions in Various Situations – Self-introduction and Introducing others – Greetings – Apologies – Requests – Social and Professional Etiquette - Telephone Etiquette.

Listening: listening for specific purposes, for details.
Speaking: speaking in the above situations with clarity, connectivity, maintaining voice characters.

Module - III:

CALL Lab: Word accent and Listening Comprehension-reading(aloud) meaningfully.

ICS Lab: Descriptions- Narrations- Giving Directions and guidelines.

Listening: listening for intelligible English
Speaking: formal and informal conversations, register.

Module- IV:

CALL Lab: Intonation and Common errors in Pronunciation- reading aloud (evaluating through recording).

ICS Lab: Extempore- Public Speaking, Oral Presentation Skills

Listening: note taking and listening for speaker's tone/attitude
Speaking: organizing, connecting ideas and sentences, short forms in spoken English, errors in spoken English

Module - V:

CALL Lab: Neutralization of Mother Tongue Influence and Conversation Practice

ICS Lab: Information Transfer, Debate

Minimum Requirement of infra structural facilities for EL Lab:

1. Computer Assisted Language Learning (CALL) Lab:

The Computer aided Language Lab for 40 students with 40 systems, one master console, LAN facility and English language software for self- study by learners.

System Requirement (Hardware component):

Computer network with LAN with minimum 60 multimedia systems with the following specifications:

a) P – IV Processor b) Speed – 2.8 GHZ, c) RAM – 512 MB Minimum
d) Hard Disk – 80 GB, e) Headphones of High quality

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, a T. V., a digital stereo –audio & video system and camcorder etc.

Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):

Prescribed Lab Manual: Rani Sudha, "***English Language Communication Skills laboratory"*** *Manual* Published by **Pearson Publication**, 5th Edition, New Delhi 2014.

Course Outcomes:

After completion of the course, students will be able to:

1. Understand the nuances of language through audio- visual experience and group activities
2. Neutralize the accent for intelligibility
3. Realize the importance of listening skills and speaking skills and their application in real life situations.
4. Recognize significance of non-verbal communication and develop confidence to face audience and shed inhibitions.
5. Speak with clarity and confidence there by enhance employability skills of the students.

Reference Books:

1. Gairns, Ruth and Redman, Stuart: Oxford Word Skills, Learn and Practice English Vocabulary, 2nd Edition, 2008.
2. Hughes , John and Mallett , Andrew: Successful Presentations: DVD and Student's Book Pack: A Video Series Teaching Business Communication Skillsfor Adult Professionals
3. Hamcock, English pronunciation in use (Intermediate),Cambridge university Press,2009
4. Karia ,Akash: Public Speaking Mastery, Speak Like a Winner , Kindle Edition, 2013.
5. Lucas, Stephen: The Art of Public Speaking**"** : Tata McGraw Hill, 11th Edition, 2011.

Websites:

1. http://www.mindtools.com/CommSkll/ActiveListening.htm
2. http://www.slideshare.net/alisonkis/dialogue-and-roleplay-activity
3. http://www.hse.ru/pubs/lib/data/access/ram/ticket/2/14309868938d576a532b71360b7354268380727a22/An%20article%20for%20Monika%20(2010).pdf

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. ISemester		
Code: 70B07	Engineering Physics Lab (Common to CE, EEE, ME, ECE, CSE, IT and Mi.E.)	L	T	P
Credits: 2		-	-	4

Course Objective:

The main objective of this course is to provide the necessary exposure to the practical aspects, which is an essential component for learning science.

List of Experiments: (Any ten experiments**)**

1. Magnetic field along the axis of current carrying circular coil- Stewart and Gee's experiment
2. LASER- Diffraction due to single slit.
3. Newton's Rings.
4. Michelson interferometer (Demonstration only).
5. Melde's Experiment – Longitudinal and Transverse modes.
6. Sonometer- Frequency of A.C supply.
7. The RLC series circuit – Determination of resonant frequency, bandwidth and quality factor.
8. Evaluation of Numerical aperture of the given fiber.
9. Energy band –gap of a material of a P-N junction diode.
10. Torsional Pendulum- Determination of Rigidity modulus of the given wire.
11. LED characteristics.
12. Solar cell characteristics.
13. LASER diode characteristics.

Course Outcomes:

On Completion of this course, students are able to:

1. Develop skills to impart practical knowledge in real time solution.
2. Understand principle, concept, working, application and comparison of results with theoretical calculations.
3. Design new instruments with practical knowledge.
4. Understand measurement technology, usage of new instruments and real time applications in engineering studies.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70502	Computer Programming Lab (Common for CE, EEE, ME, ECE,CSE, IT and Mi.E)	L	T	P
Credits: 2		-	-	4

Software Requirements: Turbo C

List of Programs:

1. a) Practice various Internal and External DOS Commands.
   b) Implement various programs logics using algorithms and flowcharts.
   c) Write sample examples of C programs to implement basic operations.
2. a) Write a C program to find smallest and largest of given three numbers.
   b) Write a C program to find the roots of a quadratic equation.
3. a) Write a C program to find the sum of individual digits of a positive integer.
   b) 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 the sequence.
4. a) Write a C program to find whether the given number is palindrome, perfect, Armstrong or strong.
   b) Write a C program to generate all the prime numbers between n1 and n2, where n1 and n2 are values supplied by the user.
5. Write C programs that use both recursive and non-recursive functions
   a) To find the factorial of a given integer.
   b) To find the GCD (greatest common divisor) of two given integers.
6. a) Write a C program to find both the largest and smallest number in a list of integers.
   b) Write a C program that uses functions to perform the following:
      i) Addition of Two Matrices
      ii) Multiplication of Two Matrices
7. a) Write a C program that uses functions to perform the following operations:
      i) To insert a sub-string into given main string from a given position.
      ii) To delete n characters from a given position in a given string.
   b) Write a C program to determine if the given string is a palindrome or not
   c) Write a C program to find substring in a given string.
   d) Write a C program to count the lines, words and characters in a given text.
8. a) Write a C program to implement functions arguments with different returns values.
   b) Write a C program to implement call by value and call by reference using functions.
9. a) Write a C program to find grades of a student's using structures and unions.
   b) Write a C program to implement nested structures.
10. a) Write a C program which copies one file to another.
    b) Write a C program to command line arguments.
11. a) Write a C program that uses non-recursive function to search for a Key value in a given list of integers using Linear search.
    b) Write a C program that uses recursive and non -function to search for a Key value in a given sorted list of integers using Binary search.
12. a) Write a C program that implements the Selection sort method to sort a given array of integers in ascending order.
    b) Write a C program that implements the Bubble sort method to sort a given list of names in ascending order.

Text Books:

1. Pradip Dey, Manas Ghosh, **"Programming in C**", Oxford University Press, 2nd Edition, 2011.
2. E. Balagurusamy, "**Computer Programming in C"**, Tata McGraw Hill, 1st Edition, 2013.

References:

1. Brian W. Kernighan, Dennis M. Ritchie, "**The C Programming Language"**, PHI, 2nd Edition, 1990.
2. Greg Perry and Dean Miller, "**C Programming Absolute beginner's guide**", QUE Publishers, 3rd Edition, 2013.
3. Paul Deitel and Harvey Deitel, "**C How to Program"**, PHI, 7th Edition, 2012.
4. Behrouz A. Forouzan, E. V. Prasad, Richard F. Gilberg, "**C programming: A Problem-Solving Approach**", Cengage Learning Press, 1st Edition, 2011.

Course Outcomes:

On the successful completion of the course, a student will be able to:

1. **Analyze** concepts in problem solving do programming in C language and write diversified solutions using C language.
2. **Identify** situations where computational methods and computers would be useful.
3. **Understand** the programming tasks using techniques learned and write pseudo-code.
4. **Compare** the program on a computer, edit, compile, debug, correct, recompile and run it.
5. **Identify** tasks in which the numerical techniques learned are applicable and apply them to write programs, and hence use computers effectively to solve the task.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70B02	Computational Mathematics (Common for CE,EEE,ME,ECE,CSE,IT and Mi.E)	L	T	P
Credits: 4		3	2	-

Pre- requisite: Basics of solving second and higher degree equations.

Course Objectives:

The objective of this course is to introduce various numerical techniques which are indispensable tools to solve many algebraic and transcendental equations. Various methods are used to reduce the global error involved in approximations. This course fills into this perceived need. The treatment should be informed by the fact that not only conceptual but also (and in some cases) more importantly numerical or computational methods are of essence.

Module – I: Algebraic and Transcendental Equations [12 periods]

Solution of Algebraic and Transcendental Equations: Introduction - Bisection Method - Method of False Position - Iteration Method – Newton-Raphson Method - Ramanujan's Method.
Gauss Jacobi – Gauss Seidel Methods

Module – II: Interpolation [12 periods]

Introduction, Errors in Polynomial Interpolation, Finite differences, Forward Differences-Backward differences, Symbolic relations and separation of symbols, Differences of a polynomial-Newton's formulae for interpolation
Central difference interpolation Formulae, Gauss Central Difference Formulae, Interpolation with unevenly spaced points: Lagrange's Interpolation formula.

Module – III: Curve fitting, Numerical Differentiation & Integration [12 periods]

A: Curve fitting: Fitting a first degree (linear) and second degree (parabola), exponential, power curves for a data by the Method of least squares.
B: Numerical Differentiation: Evaluation of derivatives, Evaluation of maximum & minimum for a given data. Numerical Integration: Trapezoidal Rule, Simpson's $1/3^{rd}$, 3/8 Rule.

Module – IV: Numerical solution of Ordinary Differential Equations [12 periods]

Solution by Taylor's series method - Picard's Method of successive Approximations - Euler's Method-Modified Euler's Method – Runge-Kutta Methods. Predictor-Corrector Methods: Milne's method - Adams- Bashforth Method.

Module – V: Numerical Solution of Partial Differential Equations [12 periods]

Classification of second order equations – Finite difference approximations to derivatives - standard 5 point formula – diagonal 5 point formula – solution of Laplace equation.
Solution of poission's equation.Solution of one dimensional heat, wave equations (by Crank-Nicolson explicit/implicit formula only).

Text Books:

1. S.S. Sastry **"Introductory Methods of Numerical Analysis"**, Prentice-Hall of India Private Limited, 4^{th} edition.
2. B.S. Grewal, **"Higher Engineering Mathematics",** Khanna Publishers, 43^{rd} Edition, Reprint 2011.

Reference Books:

1. R.K. Jain & S.R.K. Iyengar **"Advanced Engineering Mathematics"**, Narosa Publications Delhi, 3rd edition.
2. Kanti B. Datta **"Mathematical Methods of Science and Engineering",** Cengage Learning.
3. Alan Jeffrey **"Mathematics for Engineers and Scientists"**, Chapman & Hall/ CRC, 6^{th} Edition 2013
4. Michael Greenberg **"Advanced Engineering Mathematics"**, Pearson Education Second Edition.

E Resources:

a) Concerned Website links

1. http://www.simumath.com/library/book.html?code=Alg_Equations_Examples (Algebraic and transcendental equation text book by YURG BERENGARD)
2. http://jupiter.math.nctu.edu.tw/~smchang/9602/NA_lecture_note.pdf (Interpolation)
3. http://www.essie.ufl.edu/~kgurl/Classes/Lect3421/Fall_01/NM5_curve_f01.pdf (Curve fitting)
4. http://nptel.ac.in/courses/104101002/downloads/lecturenotes/module1/chapter6.pdf (Numerical Differentiation and Integration)
5. http://www.sam.math.ethz.ch/~hiptmair/tmp/NPDE10.pdf (Numerical Solution of Partial Differential Equations)

b) Concerned Journals/Magazines links

1. https://www.jstor.org/stable/27953736?seq=1#page_scan_tab_contents(Algebraic and transcendental equation by William L. Schaaf)
2. http://www.ijcsi.org/papers/IJCSI-9-6-2-413-419.pdf(Algebraic and transcendental equation by Md. Golam Moazzam)
3. http://www.iosrjournals.org/iosr-jm/papers/Vol6-issue6/J0665862.pdf (Interpolation)
4. http://www.wseas.org/multimedia/journals/mathematics/2014/a045706-398.pdf (Curve fitting)

c) NPTEL Videos

1. http://nptel.ac.in/courses/122102009 (Algebraic and transcendental equation)
2. http://nptel.ac.in/courses/112104035/14 (Mathematical methods in engineering and science by Prof. Bhaskar Dasgupta)
3. http://nptel.ac.in/courses/111107063 (Numerical solution of Ordinary Differential Equations)
4. http://nptel.ac.in/courses/111105038 (Numerical Solution of Partial Differential Equations)

Course Outcomes:

After completion of this course, students will be able to:

1. Apply numerical methods to solve some algebraic and transcendental equations to the desired level of accuracy.
2. Application of interpolation concept to evaluate missed data in data analysis.
3. Application of least squares method to solve data analysis problems and able to find the differentiation and integration by using numerical techniques.
4. Apply differential equations in engineering oriented problems and to observe patterns by using numerical techniques.
5. To find out the Numerical solution of partial differential equations.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70B08	Applied Physics (Common to EEE, ECE,CSE and IT)	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objective:

The main objective of this course is to provide the basic physics principles, would help engineers to understand the tools and techniques used in the industry and provide the necessary foundations for inculcating innovative approaches. This would create awareness about the vital role played by science and engineering in the development of new technologies.

Module –I: Electromagnetic Theory [9 Periods]

Gradient of Scalar field and its Physical Significance; Divergence and Curl of Vector field; Qualitative treatment of Gauss's Law of electrostatics and Gauss law of magnetostatics, Ampere's law and its modification, Faraday's law of electromagnetic induction, Induced E.M.F in a conductor, Lenz's Law , Maxwell equations in differential form, wave equation for free space, Poynting theorem.

Module–II: Dielectric Properties of Materials [9 Periods]

Electric dipole, Dipole moment, Dielectric constant, Polarizability, Electric Susceptibility, Displacement Vector, Electronic, Ionic and Orientation Polarizations and Calculation of Polarizabilities - Electronic and ionic; Qualitative treatment of Internal Fields in solids, Clausius - Mossotti Equation, Piezo-electricity, Ferro- electricity, Barium titanate, Applications of Ferroelectric materials.

Module–III: Laser& Fiber Optic Materials

A: Laser: [8 Periods]

Characteristics of LASER; Absorption, Spontaneous and Stimulated transitions; Einstein's Coefficients and Relations between them; Population Inversion; Pumping - Optical and Electrical; Meta-stable State; Three and Four level pumping schemes; Ruby LASER; Helium-Neon LASER; Nd: YAG LASER; Semiconductor Diode LASER; Applications of LASER - drilling, welding, data storage, optical signal processing and nuclear fusion.

B: Fiber Optic Materials [6 Periods]

Principle of Optical Fiber; Acceptance angle and Acceptance cone, Numerical Aperture; Step and Graded index Optical Fibers and their Refractive Index profiles; Attenuation in Optical Fibers, Fiber materials, Application of Optical Fibers - Medical, Level sensor and Communication system.

Module– IV: Band Theory of Solids: [9 Periods]

Qualitative discussion of Classical free electron theory, Fermi - Dirac distribution, Qualitative discussion of Quantum free electron theory; Electron in a periodic Potential (Bloch Theorem), Kronig-Penny Model (Qualitative Treatment), Origin of energy Band formation in solids, Classification of materials into Conductors, Semi-Conductors &Insulators, Concept of effective mass of an electron.

Module – V: Semiconductor Physics [9 Periods]

Expression for Charge carrier concentration in Intrinsic semiconductors; Fermi Level in Intrinsic Semiconductors (Derivation) and Extrinsic semiconductor (dependence on temperature and doping concentration); concept of drift and diffusion currents, Continuity equation; Hall Effect; Direct and Indirect band gap semiconductors, Photo conductivity, optical response, LED materials, Construction of LED.

Text Books:

1. K.Vijaya Kumar, S Chandralingam, "**Modern Engineering Physics**'' Volume I & II, S. Chand, 1st Edition, 2017.
2. M. N.Avadhanulu, P. G.Kshirsagar, " **A Textbook of Engineering Physics"**, Revised Edition 2014.

Reference Books:

1. S. L. Gupta & Sanjeev Gupta, "Unified **Physics - Electricity, Magnetism and Electronics"**, Jai PrakashNath Publications, 47th Edition 2017.
2. P. K.Palanisamy, "**Engineering Physics"**, 4th Edition, SciTech Publications, 2014.
3. Ghatak Ajay and Lokanatham, "**Quantum Mechanics"**, Springer Publications, 1stEdition, 2014.
4. G Prasad and Bhimashankaram, "**Engineering Physics"**, B S Publications, 3rdEdition, 2008.
5. Sulabha K. Kulkarni, "**Nano technology - Principles and practices"**, Springer Publications. 3rd Edition, 2014.

E-Resources:

1. http://www.gistrayagada.ac.in/gist_diploma/PHYSICS-StudyMaterial.pdf
2. http://www.faadooengineers.com/threads/3300-Applied-Physics-Ebooks-pdf-free-download?s=1b6cb6b1de4e7152298bd9d60156cd11

Journals:

1. http://aip.scitation.org/journal/jap
2. http://www.springer.com/physics/journal/340

NPTEL Videos:

1. https://www.youtube.com/watch?v=nGQbA2jwkWI
2. http://nptel.ac.in/courses/115101005/1
3. http://nptel.ac.in/courses/115106061/13

Course Outcomes:

1. After completion of the course, student will be able to:
2. Apply basic knowledge on electromagnetic principles and using these wave equations for the propagation
3. Recognize the dielectric properties of matter.
4. Be aware of the concepts and applications of LASER and Optical fibers.
5. Analyze the formation the bands thereby classification of materials on the basis of transport properties.
6. Explore the concepts of semiconductors physics, which is basic to the electronics engineering.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70B10	Applied Chemistry (Common for CE,EEE,ME,ECE,CSE,IT and Mi.E)	L	T	P
Credits: 4		4	-	-

Pre-requisite: Nil

Course Objective:

The purpose of this course is to emphasize the relevance of fundamentals and applications of chemical sciences in the field of engineering and to provide basic knowledge on electrochemistry, batteries, corrosion, applications of conducting polymers in various fields, fuels in day to day life and the concepts of composites, Nano materials and green chemistry.

Module I: Water **[10 Periods]**

Hardness of Water: causes of hardness, expression of hardness – units – types of hardness, Alkalinity of water specifications for drinking water (BIS and WHO standards); Estimation of temporary & permanent hardness of water by EDTA method - numerical problems. Boiler troubles – Scale &sludge, Priming and foaming, caustic embrittlement and boiler corrosion; Treatment of boiler feed water – Internal treatment (Phosphate, carbonate and calgon conditioning).External treatment – Lime Soda process and ion exchange process, Numerical Problems. Disinfection of water by chlorination and ozonisation. Desalination by Reverse osmosis.

Module II: Electrochemistry and Corrosion

A: Electrochemistry **[6 Periods]**

Introduction-Conductance-Specific and Equivalent conductance. Electrochemical cells- EMF, Galvanic Cells, Electrode potential, Calomel Electrode, glass electrode; Nernst equation its applications and numerical problems - Batteries: Primary cells (dry cells) and secondary cells (lead-Acid cell, Ni-Cd cell). Applications of batteries. Fuel cells – Hydrogen – Oxygen fuel cell and its Applications.

B: Corrosion: **[6 Periods]**

Causes and effects of corrosion: Theories of corrosion – Chemical & Electrochemical corrosion; Factors affecting rate of corrosion – Nature of metal and Nature of Environment – Corrosion control methods – Cathodic protection (Sacrificial anodic). Surface coatings: Metallic coatings & methods of application of metallic coatings - hot dipping (Galvanization), Cementation, Electroplating (Copper plating), Electroless plating of Nickel.

Module III: Polymers **[6+6 Periods]**

A: Types of Polymerization-Chain (Free radical Mechanism)&Step growth. Plastics: Thermoplastic & Thermosetting plastics, Compounding& fabrication of plastics (Compression and injection moulding). Preparation, properties, engineering applications of PVC, Teflon, Nylon – 6,6 and Bakelite.

B: Conducting polymers: Polyacetylene, Polyaniline, Mechanism of Conduction, doping; applications of Conducting polymers. Bio degradable polymers: poly lactic acid and poly vinyl acetate. Elastomers: Natural Rubber-vulcanization. Synthetic Rubber- preparatrion, properties and applications of BuNa-S, Butyl rubber. Fibre-reinforced polymers-properties and applications.

Module IV: Fuels and Combustion

A: Fuels: **[6 Periods]**

Classification – solid fuels: coal – analysis of coal - proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining. Cracking- fixed bed catalytic cracking, synthesis of petrol by Fisher- Tropsch method. Knocking – octane and cetane rating. Gaseous fuels - constituents, characteristics and applications of natural gas, LPG and CNG.

B: Combustion: **[6 Periods]**

Combustion-Definition, Calorific value of fuel – HCV, LCV; Determination of calorific value by Junkers gas calorimeter – Numerical problems on combustion. Renewable energy sources-solar, wind, hydro power and biomass energy advantages, disadvantages and Applications

Module V: Composites, Nano Chemistry and Green Chemistry

A: Composites: **[4 Periods]**

Basics of composites, composition and characteristics-types of composites –particle and fiber reinforced composites and their applications. Concept of Bio-fuels (Biodiesel, Bioethanol and Biogas), Biosensors, Biosurfactants.

B: Nano Chemistry: **[3 Periods]**

Introduction and classification of Nanomaterials (Fullerence, Carbon nano tubes and nanowires only) - Application of nanomaterials. Brief introduction to nanocomposites

C: Green Chemistry: **[4 Periods]**

Introduction, principles of green chemistry, introduction to ultrasonic and microwave assisted reactions, solvent free reactions. Concept of R4M4 (Reduce, Reuse, Recycle, Redesign; Multipurpose, Multidimensional, Multitasking and Multi-tracking) model with special reference of Econoburette, Survismeter.

Text Books:

1. P. C. Jain and Monica Jain, "A text Book of Engineering Chemistry", Dhanpat Rai Publications, New Delhi, 12th Edition 2006.
2. M. Thirumala Chary and E. Laxminarayana, "Engineering Chemistry" by SciTech publications(INDIA) PVT Ltd, Third Edition,2016 .

Reference Books:

1. B. Rama Devi, Ch. VenkataRamana Reddy and Prasantha Rath**, "Text Book of Engineering chemistry"** by Cengage Learning India Pvt.Ltd,2016.
2. F.W. Billmeyer, "**Text Book of Polymer Science"**, John Wiley & Sons, 4th Edition, 1996.
3. M.G. Fontana, N. D. Greene, "**Corrosion Engineering"**, McGraw Hill Publications, New York, 3rd Edition, 1996.
4. B. R. Puri, L. R. Sharma & M. S. Pathania, "**Principles of Physical Chemistry",** S. Nagin Chand &Co., New Delhi, 23rd Edition, 1993.
5. G. A. Ozin and A.C. Arsenault, "**Nanochemistry: A Chemical Approach to Nanomaterials**", RSC Publishing, 3rdEdition, 2005.

E Resources:

a)Concerned Website links:

i) https://books.google.co.in/books?isbn=0070669325 (Engineering chemisty by Sivasankar)
ii)https://www.youtube.com/watch?v=yQUD2vzfgh8 (Hot dipping Galvanization)

b)Concerned Journals/Magazines links:

1) Journal of Industrial & Engineering chemistry (Elsevier)

2) Journal of fuel chemistry & Technology (Elsevier)

c) NPTEL Videos:

1. nptel.ac.in/courses/113108051/ (corrosion &electrochemistry web course)
2. http://nptel.ac.in/course.php (Material chemistry video& web courses)

Course Outcomes:

After completion of the course, students will be able to:

1. Acquire knowledge on Water treatment, specifically hardness of water.
2. Acquire knowledge on Electrochemical cell, fuel cells, batteries and its applications.
3. Know the properties and uses of polymeric materials.
4. Analyze the combustion mechanism of various types of fuels (solid, liquid, gas)
5. Acquire basic knowledge on the concepts of Composites, Nano and Green Chemistry.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70201	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (Common for CE,EEE,ME,ECE,CSE,IT and Mi.E)	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objectives: To introduce the concept of electrical circuits and its components. To introduce the characteristics of various electronic devices. To impart the knowledge of various configurations, characteristics and applications of electrical & electronic components.

Module I: Introduction to Electrical Circuits [10 Periods]

Circuit Concept – R-L-C parameters – Voltage and Current sources – Independent and dependent sources - Source transformation – Voltage and Current relationship for passive elements – Series, parallel, series-parallel, star-to-delta and delta-to-star transformation. Kirchhoff's laws – KCL and KVL, Loop and Nodal analysis of Networks with independent voltage and current sources.

Module II Magnetic Circuits [9 Periods]

Magnetic Circuits – Faraday's laws of electromagnetic induction – concept of self ad mutual inductance – dot convention – coefficient of coupling – composite magnetic circuit - Analysis of series and parallel magnetic circuits. Hysteresis and Eddy currents.

Module III Single Phase A.C Circuits [10 Periods]

A: R.M.S and Average values and form factor for sinusoidal wave forms, Steady state analysis of pure R, L and C with sinusoidal excitation.

B: Steady state analysis of series RL, RC, RLC - Concept of Reactance, Impedance, Susceptance and Admittance – Phase and Phase difference – Power factor, Real and Reactive powers.

Module IV Semiconductor Diode Characteristics [10 Periods]

Qualitative theory of the p-n Junction, the p-n junction as a diode, band structure of an open circuited p-n junction, the current components in a p-n diode, quantitative theory of the p-n diode currents, the volt ampere characteristics, the temperature dependence of V-I characteristics, diode resistance, ideal versus practical diodes, diode equivalent circuits, space charge or transition capacitance CT, diffusion capacitance, breakdown mechanism in diode, Zener diode, V-I characteristics of Zener diode.

Module V Diode Applications & Special Semiconductor Devices [9 Periods]

Diode Applications: Introduction, load line analysis, series diode configurations, parallel and series-parallel configuration, half-wave rectification, full-wave rectification, general filter considerations, Inductive, Capacitive, LC and CLC filters, Zener diode as voltage regulator. **Special Semiconductor Devices**: Principle of operation, Characteristics and applications of Tunnel diode, Varactor diode, Photo Diode, LED, LCD.

Text Books

1. M. Surya Kalavathi, Ramana Pilla, Ch. Srinivasa Rao, Gulinindala Suresh, **"Basic Electrical and Electronics Engineering"**, S. Chand and Company Limited, New Delhi, 1st Edition, 2017.
2. R. L. Boylestad and Louis Nashlesky, **"Electronic Devices & Circuit Theory"**, Pearson Education, 2007.

References

1. V. K. Mehtha and Rohit Mehta, **"Principles of Electrical Engineering and Electronics"**, S. Chand & Co., 2009.
2. Jacob Milliman, Christos C .Halkias, Satyabrata Jit (2011), **"Electronic Devices and Circuits"**, 3 rd edition, Tata McGraw Hill, New Delhi.
3. Thomas L. Floyd and R. P. Jain, "**Digital Fundamentals"**, Pearson Education, 2009.
4. David A. Bell, **"Electronic Devices and Circuits"**, Oxford University Press, 2008.
5. Nagrath I.J. and D. P. Kothari, "**Basic Electrical Engineering"**, Tata McGraw Hill, 2001.
6. Mittle N., **"Basic Electrical Engineering"**, Tata McGraw Hill Education, New Delhi, 2nd Edition, 2005.

E - Resources

1. https://www.electrical4u.com/ohms-law-equation-formula-and-limitation-of-ohms-law/
2. https://www.eeweb.com/passives
3. http://nptel.ac.in/courses/108108076/
4. http://nptel.ac.in/downloads/108105053/

Course Outcomes

At the end of the course, students should be able to

1. Apply basic laws in electrical circuit.
2. Apply the faraday's laws of electromagnetism to real world.
3. Analyze the response of AC network.
4. Know the practical importance of Diode and its characteristics.
5. Recognize the operation of Diode and its applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70503	Data Structures (Common for EEE, ECE, CSE and IT)	L	T	P
Credits: 4		4	-	-

Prerequisites: Computer Programming

Course Objectives:
This course will deliver the knowledge in introducing the concepts of various data structures such as linked lists, stacks, queues, trees and graphs along with the applications.

Module I: Performance Analysis and Introduction to data structures

A: Performance Analysis **[04 Periods]**

Algorithm definition and characteristics, time and space complexity, Asymptotic Notations – Big O, Omega and Theta notations.

B: Introduction to data structures **[05 Periods]**

Types of data structures: Linear and Non-linear data structures. Recursion definition- Linear and Binary recursion, Design methodology and implementation of recursive algorithms, Recursive algorithms for Towers of Hanoi.

Module II: Linked Lists

A: Single Linked Lists: **[05 Periods]**

Definition, Operations-Insertion, Deletion and Searching, Concatenating single linked lists, Circular linked lists, Operations- Insertion, Deletion.

B: Double Linked Lists: **[05 Periods]**

Definition, Operations- Insertion, Deletion. Applications of Linked list. Sparse matrices - Array and linked representations.

Module III: Stacks and Queues

A: Stacks: **[05 Periods]**

Basic stack operations, Representation of a stack using arrays and linked lists, Stack Applications - Reversing list, factorial calculation, postfix expression evaluation, infix-to-postfix conversion.

B: Queues **[04 Periods]**

Basic queue operations, Representation of a queue using array and Linked list, Classification and implementation – Circular, Enqueue and Dequeue, Applications of Queues.

Module IV: Trees and Graphs

A: Trees **[06 Periods]**

Basic concepts of Trees, Binary Tree: Properties, Representation of binary tree using array and linked lists, operations on a binary tree, binary tree traversals, creation of binary tree from in, pre and post-order traversals, Tree traversals using stack, Threaded binary tree.

B: Graphs **[05 Periods]**

Basic concepts of Graphs, Representation of Graphs using Linked list and Adjacency matrix, Graph algorithms, Graph traversals- (BFS & DFS).

Module V: Search Trees

A: Binary Search Trees and AVL Trees **[05 Periods]**

Binary Search Tree, Definition, Operations - Searching, Insertion and Deletion, AVL Trees (Elementary treatment-only Definitions and Examples).

B: B-Trees and Red-Black Tree **[04 Periods]**

B-Trees, Red-Black and Splay Trees (Elementary treatment-only Definitions and Examples), Comparison of Search Trees.

Text Books:

1. Jean Paul Tremblay, Paul G Sorenson, "An Introduction to Data Structures with Applications", Tata McGraw Hills, 2nd Edition, 1984.
2. Richard F. Gilberg, Behrouz A. Forouzan, "Data Structures: A Pseudo code approach with C ", Thomson (India), 2nd Edition, 2004.

References:

1. Horowitz, Ellis, Sahni, Sartaj, Anderson-Freed, Susan, "Fundamentals of Data Structure in C", University Press (India), 2nd Edition, 2008..
2. A. K. Sharma, "Data structures using C", Pearson, 2nd Edition, June, 2013.
3. R. Thareja, "Data Structures using C", Oxford University Press, 2nd Edition, 2014.

E-Resources:

a) Concerned Website links:

1. http://gvpcse.azurewebsites.net/pdf/data.pdf
2. http://www.sncwgs.ac.in/wp-content/uploads/2015/11/Fundamental-Data-Structures.pdf

b) Concerned Journals/Magazines links:

1. http://www.learnerstv.com/Free-Computer-Science-Video-lectures-ltv247-Page1.htm

c) NPTEL Videos:

1. http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7-3lcmoMApVUMmjlExpIb1zste4YXX1pSpX8a2mLgDzZ-E41CJ6PVmY4S0MqVbxsFQ
2. http://nptel.ac.in/courses/106102064/1

Course Outcomes:

On the successful completion of the course, a student will be able to:

1. Identify the appropriate data structures and analyze the performance of algorithms.
2. Understand and implement single, double, and circular linked-lists.
3. Implement Stacks and Queues using array and linked-list representations.
4. Develop programs by using non linear data structures such as trees and graphs.
5. Design and Implement applications of advanced data structures.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70B11	Applied Chemistry Lab (Common for CE,EEE,ME,ECE,CSE,IT and Mi.E)	L	T	P
Credits: 2		-	-	4

Course objectives:
To provide the students with practical knowledge of quantitative analysis of materials by classical and instrumental methods for developing experimental skills in building technical competence.

List of Experiments:

1. Calibration of Volumetric apparatus.
2. Estimation of Hardness of water by EDTA Method.
3. Estimation of pH of an acid (Three methods).
4. Estimation of alkalinity of water.
5. Estimation of strength of an acid by Conductometry.
6. Estimation of strength of an acid by Potentiometry.
7. Determination of ferrous ion in cement by colorimeter.
8. Determination of viscosity of given liquids.
9. Preparation of Nylon 6,6.
10. Preparation of Thiokol Rubber.
11. Determination of surface tension of given sample using stalagnometer.
12. To Study the inversion of cane sugar by polarimeter.
13. Estimation of Mn^{+2} ion in $KMnO_4$ by Colorimeter.

Course outcomes:
At the end of the course

1. Students are able to estimate the impurities present in water samples.
2. Ability to select lubricants for various purposes.
3. Ability to prepare advanced polymer materials.
4. Ability to know the strength of an acid present in batteries.
5. Ability to find the Fe^{+2} present in unknown substances/ores using titrimetric and instrumental methods.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70504	Data Structures Lab (Common for EEE, ECE, CSE and IT)	L	T	P
Credits: 2		-	-	4

Software Requirements: Turbo C

List of Programs:

1. Write a recursive program to solve Towers of Hanoi problem - N disks are to be transferred from peg S to peg D with Peg I as the intermediate peg.

2. Write a program to create a single linked list, with the following operations:
a) Insertion b) Deletion c) Display the elements d) Count no of elements.

3. Write a program to create a circular linked list, with the following operations:
a) Insertion b) Deletion c) Display the elements d) Count number of elements.

4. Write a program to create a double linked list, with the following operations:
a) Insertion b) Deletion c) Display the elements d) Count number of elements.

5. Write a program to implements stack operations using:
a) Arrays b) Linked list

6. Write a program to: a) Evaluate Postfix expression.
b) Convert infix expression into postfix expression

7. Write a program to implements Linear Queue operations using:
a) Arrays b) Linked list

8. Write a program to implements Circular Queue operations using Arrays

9. Write a program to implements Double-ended Queue operations using:
a) Arrays b) Double Linked List

10. Write a recursive program to create a Binary Tree of integers, traverse the tree in preorder, in order and post order and also print the number of leaf nodes and height of the tree.

11. Write a program to create a Binary Search Tree (BST) and perform insert and search operations on it.

12. Write a program for implementing the following graph traversal algorithms:
a) Breadth First Search (BFS) b) Depth First Search (DFS)

Text Books:

1. Jean Paul Tremblay, Paul G Sorenson, "**An Introduction to Data Structures with Applications**", Tata McGraw Hills, 2nd Edition, 1984.
2. Richard F. Gilberg, Behrouz A. Forouzan, "**Data Structures: A Pseudo code approach with C** ", Thomson (India), 2nd Edition, 2004.

References:

1. Horowitz, Ellis, Sahni, Sartaj, Anderson-Freed, Susan, "**Fundamentals of Data Structure in C**", University Press (India), 2nd Edition, 2008..
2. A. K. Sharma, "**Data Structures using C**", Pearson, 2nd Edition, June, 2013.
3. R. Thareja, "**Data Structures using C**", Oxford University Press, 2nd Edition, 2014.

Course Outcomes:

On the successful completion of the course, a student will be able to:

1. **Identify** the appropriate recursive algorithms and analyze the performance of algorithms.
2. **Understand** and implement single, double, and circular linked-lists.
3. **Implement** linear data structures such as Stacks and Queues using array and linked-list representations.
4. **Implement** non linear data structures such as trees and graphs.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70303	ENGINEERING WORKSHOP	L	T	P
Credits: 2	(Common for CE, EEE, ME, ECE, CSE, IT and Mi.E)	-	-	4

Objectives:
To understand the usage of hand tools, acquire the skills in model / pattern making and familiarize with various work materials and tools.

I. Trades for Exercises:
At least two exercises from each trade:

1. Carpentry
2. Fitting
3. Tin-Smithy
4. House-wiring
5. Foundry
6. Arc welding
7. IT workshop – Hardware identification and connectivity, assembling, disassembling and OS Installation

II. Trades for Demonstration& Exposure

1. Machine shop
2. Plumbing
3. Wood working lathe
4. Identification of Electronic Components
5. Blacksmithy

Course Outcomes:

After completion of the course, students should be able to:

1. Knowledge of carpentry process and methods used in the design and fabrication, installation, maintenance and repair of structures and fixtures (e.g., furniture, cabinets) to accomplish work assignments.
2. Assembling together of part and removing metals to secure the necessary joint by using fitting and welding.
3. Understand the hardware components of house wiring.
4. Understand the manufacturing process using machine shop.
5. Analyze the different types of computer hardware and software installation.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70M01	Computational Mathematics Lab (Common for CE,EEE,ME,ECE,CSE,IT and Mi.E)	L	T	P
Credits: 0		-	-	3

Following Programming is to be done in C Language:

Course Objectives:

The objective of this course is to introduce various numerical techniques which are indispensible tools to solve many algebraic and transcendental equations. Various methods are used to reduce the global error involved in approximation root values in C Language.

Module – I:

1. Find the roots of Non-linear equation using Bisection method.
2. Find the roots of Non-linear equation using Regula - falsi method.
3. Find the roots of Non-linear equation using Newton-Raphson method.
4. Find the roots of Non-linear equation using Iteration method.

Module – II:

5. Find the smallest root of non-linear equation using Ramanujan's method
6. Solve the system of non-homogeneous linear equations using Gauss-Jacobi method
7. Solve the system of non-homogeneous linear equations using Gauss-siedal method
8. Lagrange's interpolation for unevenly spaced points

Module – III:

9. Numerical solution of first order O.D.E. using Euler's method.
10. Numerical solution of first order O.D.E. using 4^{th} order Runge-Kutta method.
11. Numerical Integration using Trapezoidal Rule
12. Numerical Integration using Simpson's Rule

Manual: Numerical Methods in Engineering & Science (with Programs in C, C++ & MATLAB) by B.S. Grewal, Khanna Publisher. 2014

References:

1. S.S. Sastry **"Introductory Methods of Numerical Analysis"**, Prentice-Hall of India Private Limited, 4^{th} edition.
2. Sankara Rao K. "**Numerical Methods for Scientists and Engineers**", Prentice-Hall. 7^{th} Edition, 2008.

E-Resources:

a) Concerned Website links:

1. www.codewithc.com › Numerical Methods › Numerical Methods & C/C++(Source code for Newton Raphson Method in C)
2. vle.du.ac.in/mod/resource/view.php?inpopup=true&id=13354 (Solutions of Algebraic and Transcendental Equations –Part I)
3. www.dailyfreecode.com › Articles › C Programming › Numerical Methods (Code for program of BISECTION METHOD in C Programming)

b) Concerned Journals/Magazines links:

1. www.ijcsi.org/papers/IJCSI-9-6-2-413-419.pdf (A Robust method for solving Transcendental Equations by Md.GolamMoazzam)
2. http://paulbourke.net/miscellaneous/interpolation/ (interpolation)
3. http://www.tutorialspoint.com/cprogramming/c_functions.htm (interpolation)

c) NPTEL Videos:

1. https://www.class-central.com/mooc/2486/nptel-introduction-to-programming-in-c (Solutions of Algebraic and Transcendental Equations –Part I)
2. http://freevideolectures.com/Course/2663/Numerical-Methods-and-Programing (Interpolation)
3. http://www.nptel.ac.in/courses/111107063/3 (Numerical solution of first order ordinary differential equation)

Course Outcomes:

1. Students able to an find the root of an Algebraic and Transdental equations by using various methods in C language.
2. Students able to an find the root of an non-homogeneous linear equations by using various methods in C language.
3. Students able to an find the root of an of first order O.D equations by using various methods in C language.