

# **ACADEMIC REGULATIONS AND SYLLABUS**

**CHOICE BASED CREDIT SYSTEM**

**MLR20**

## **ELECTRONICS AND COMMUNICATION ENGINEERING**

**For**

**Bachelor of Technology (B.Tech)**

**For the batches admitted 2020-21**

B. Tech. - Regular Four Year Degree Program  
(For batches admitted from the academic year 2020 - 21)

&

B. Tech. - Lateral Entry Scheme  
(For batches admitted from the academic year 2021 - 22)



**MLR Institute of Technology**

**(Autonomous)**

Laxman Reddy Avenue, Dundigal  
Hyderabad – 500043, Telangana State

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## FOREWORD

The autonomy is conferred on MLR Institute of Technology by UGC, based on its performance as well as future commitment and competency to impart quality education. It is a mark of its ability to function independently in accordance with the set norms of the monitoring bodies like UGC and AICTE. It reflects the confidence of the UGC in the autonomous institution to uphold and maintain standards it expects to deliver on its own behalf and thus awards degrees on behalf of the college. Thus, an autonomous institution is given the freedom to have its own **curriculum, examination system and monitoring mechanism**, independent of the affiliating University but under its observance.

MLR Institute of Technology is proud to win the credence of all the above bodies monitoring the quality in education and has gladly accepted the responsibility of sustaining, if not improving upon the standards and ethics for which it has been striving for more than a decade in reaching its present standing in the arena of contemporary technical education. As a follow up, statutory bodies like Academic Council and Boards of Studies are constituted with the guidance of the Governing Body of the College and recommendations of the JNTU Hyderabad to frame the regulations, course structure and syllabi under autonomous status.

The autonomous regulations, course structure and syllabi have been prepared after prolonged and detailed interaction with several expertise solicited from academics, industry and research, in accordance with the vision and mission of the college in order to produce quality engineering graduates to the society.

All the faculty, parents and students are requested to go through all the rules and regulations carefully. Any clarifications, if needed, are to be sought, at appropriate time with principal of the college, without presumptions, to avoid unwanted subsequent inconveniences and embarrassments. The Cooperation of all the stake holders is sought for the successful implementation of the autonomous system in the larger interests of the college and brighter prospects of engineering graduates.

**PRINCIPAL**

# **COURSE STRUCTURE**

## **ECE –I SEM**

I YEAR I SEMESTER									
Code	Course	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A5BS01	Calculus and Applications	BSC	3	1	0	4	30	70	100
A5BS12	Chemistry of Materials	BSC	4	0	0	4	30	70	100
A5CS01	Programming for Problem Solving	ESC	3	0	0	3	30	70	100
A5HS01	Communicative English	HSMC	2	0	0	2	30	70	100
A5CS02	Programming for Problem Solving Laboratory	ESC	0	0	4	2	30	70	100
A5BS14	Engineering Chemistry Laboratory	BSC	0	0	3	2	30	70	100
A5HS02	English Language and Communication Skills Laboratory	HSMC	0	0	3	2	30	70	100
<b>TOTAL</b>			<b>12</b>	<b>01</b>	<b>10</b>	<b>19</b>	<b>210</b>	<b>490</b>	<b>700</b>
<b>Mandatory Course (Non-Credit)</b>									
A5MC01	Technical Seminar-I		0	0	2	0	30	70	100

# **I SEMESTER SYLLABUS**

## CALCULUS AND APPLICATIONS

<b>I B.TECH I SEMESTER-ECE</b>								
Course Code:	Category	Hours / Week			Credits	Maximum Marks		
<b>A5BS01</b>	<b>BSC</b>	L	T	P	C	CIA	SEE	Total
		3	1	-	4	30	70	100
<b>Contact Classes: 44</b>		<b>Tutorial Classes: 08</b>		<b>Practical Classes:-- Nil</b>			<b>Total Classes: 52</b>	
<p><b>Course Objectives</b></p> <p>To learn</p> <ol style="list-style-type: none"> <li>1. Concept of Rank of a matrix, Consistency and solving system of linear equations.</li> <li>2. The concept of differential equations and solve them using appropriate methods.</li> <li>3. Usage of the appropriate test to find the convergence and divergence of the given series.</li> <li>4. Evaluation of differential equation using Laplace Transform techniques.</li> <li>5. The partial derivatives of several variable functions.</li> </ol>								
<b>UNIT-I</b>	<b>THEORY OF MATRICES</b>						<b>Classes: 10</b>	
<p>Finding rank of a matrix by reducing to Echelon form, Consistency of system of linear equations (homogeneous and non-homogeneous) using the rank of a matrix, Eigen values and Eigen vectors and its properties (with out proof), Cayley-Hamilton theorem (Statement and verification)-Finding inverse and powers of a matrix by Cayley-Hamilton theorem, Diagonalization of matrices.</p>								
<b>UNIT-II</b>	<b>ORDINARY DIFFERENTIAL EQUATIONS</b>						<b>Classes: 12</b>	
<p>Introduction- Exact and reducible to Exact differential equations-Newton's Law of cooling-Law of Growth and Decay. Linear differential equations of second and higher order with constant coefficients - Non-Homogeneous term of the type <math>Q(x) = e^{ax}</math>, <math>\sin ax</math>, <math>\cos ax</math>, <math>e^{ax}v(x)</math>, <math>x^n v(x)</math> - Method of variation of parameters.</p>								
<b>UNIT-III</b>	<b>SEQUENCES AND SERIES</b>						<b>Classes: 08</b>	
<p>Basic definitions of Sequences and series – Convergence and divergence –Comparison Test- Ratio Test – Raabe's Test-Integral Test – Cauchy's <math>n^{\text{th}}</math> root Test –Absolute and Conditional convergence – Power Series.</p>								
<b>UNIT-IV</b>	<b>LAPLACE TRANSFORMS</b>						<b>Classes: 12</b>	
<p>Laplace transforms of elementary functions- First shifting theorem - Change of scale property – Multiplication by <math>t^n</math>- Division by <math>t</math> – Laplace transforms of derivatives and integrals – Unit step function – Second shifting theorem – Periodic function – Evaluation of integrals by Laplace transforms – Inverse Laplace transforms- Method of partial fractions – Other methods of finding inverse transforms – Convolution theorem – Applications of Laplace transforms to ordinary differential equations.</p>								

<b>UNIT-V</b>	<b>CALCULUS OF SEVERAL VARIABLES</b>	<b>Classes: 10</b>
Limit, Continuity - Partial derivative- Partial derivatives of higher order -Total derivative – Chain rule, Jacobians-functional dependence & independence. Applications: Maxima and Minima of functions of two variables without constraints and Lagrange's method (with constraints)		
<b>Text Books:</b>		
1. Ervin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006. 2. B.S.Grewal, Higher Engineering Mathematics, Khanna publishers, 36th Edition, 2010.		
<b>Reference Books:</b>		
1. G.B.Thomas, calculus and analytical geometry,9th Edition, Pearson Reprint 2006. 2. N.P Bali and Manish Goyal ,A Text of Engineering Mathematics, Laxmi publications,2008. 3. E.L.Ince, Ordinary differential Equations, Dover publications,1958.		
<b>Web references:</b>		
1. <a href="https://www.efunda.com/math/math_home/math.cfm">https://www.efunda.com/math/math_home/math.cfm</a> 2. <a href="https://www.ocw.mit.edu/resources/#Mathematics">https://www.ocw.mit.edu/resources/#Mathematics</a> 3. <a href="https://www.sosmath.com/">https://www.sosmath.com/</a> 4. <a href="https://www.mathworld.wolfram.com/">https://www.mathworld.wolfram.com/</a>		
<b>E -Text Books:</b>		
1. <a href="https://www.e-booksdirectory.com/details.php?ebook=10166">https://www.e-booksdirectory.com/details.php?ebook=10166</a>		
<b>MOOCS Course:</b>		
1. <a href="https://swayam.gov.in/">https://swayam.gov.in/</a> 2. <a href="https://onlinecourses.nptel.ac.in/">https://onlinecourses.nptel.ac.in/</a>		
<b>Course Outcomes</b> <b>At the end of the course, student will be able to:</b> <ol style="list-style-type: none"> <li>1. Solve the system of linear equations using rank of the matrices.</li> <li>2. Identify the different types of differential equations and solve those using appropriate methods.</li> <li>3. Apply the appropriate test to find the convergence and divergence of the given series.</li> <li>4. Solve the differential equations using Laplace transform techniques.</li> <li>5. Find the Maxima and Minima of several variable functions.</li> </ol>		

## CHEMISTRY OF MATERIALS

<b>I B.TECH I SEMESTER-ECE</b>								
<b>Course Code:</b>	<b>Category</b>	<b>Hours / Week</b>			<b>Credits</b>	<b>Maximum Marks</b>		
<b>A5BS12</b>	<b>BSC</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		4	0	0	4	30	70	100
<b>Contact Classes: 52</b>	<b>Tutorial Classes: 00</b>	<b>Practical Classes: -00</b>			<b>Total Classes: 52</b>			
<b>Course Objectives</b>								
Students will be able:								
1. To analyze the parameters of various water samples then compare and conclude better water treatment method.								
2. To make use of the basic concepts to develop electrochemical cells, photovoltaic cell.								
3. To apply the Redox principles for construction of batteries								
4. To apply the methods of metal finishing in solving corrosion related problems.								
5. To select the advanced materials and provide their relevance in the respective engineering fields.								
<b>UNIT-I</b>	<b>WATER TECHNOLOGY</b>						<b>Classes: 10</b>	
Introduction - Hardness of water- Expression and Units of Hardness - Determination of hardness by complexometric method- Numerical problems -Potable water and its specifications --external treatments (zeolite process, ion exchange process) - Desalination of Brackish water by Reverse Osmosis.								
<b>UNIT-II</b>	<b>ELECTROCHEMICAL ENERGY CHANGES AND ITS APPLICATIONS</b>						<b>Classes: 10</b>	
Electro chemical cells – electrode potential - standard electrode potential - Nernst Equation -Types of electrodes - SHE, Calomel and Glass electrode -Electrochemical series, and its application-Numerical Problems. Solar Energy - Introduction-Photovoltaic cell-construction, working and its applications								
<b>UNIT-III</b>	<b>MATERIALS FOR ENERGY SECTOR</b>						<b>Classes: 10</b>	
Basic concepts- battery characteristics- classification of batteries- Important applications of batteries-Modern batteries-zinc air, lithium cells-LiMnO <sub>2</sub> cell- challenges of battery technology. Biosensors: Introduction- advantages of Biosensors, Biochips or Biological computers.								
<b>UNIT-IV</b>	<b>CORROSION AND METAL FINISHING</b>						<b>Classes: 12</b>	
Introduction-causes and effects-theories of corrosion (chemical and electrochemical)-factors influencing rate of corrosion- corrosion control methods (proper designing, cathodic protection)-Protective coatings: Galvanizing, Tinning - electroplating (Copper), electro less plating (nickel). Organic surface coating - Paints (constituents, functions, special paints).								
<b>UNIT-V</b>	<b>ADVANCED MATERIALS AND ITS APPLICATIONS</b>						<b>Classes: 10</b>	
Polymers -Introduction - Differences between thermoplastic and thermosetting resins -preparation of conducting polymers (Polyaniline) - Biodegradable polymers - Applications Nanomaterials - Introduction - chemical synthesis (Sol- gel method) – Nano particles - Nano structure - Supra molecular system - Future perspective Smart materials - Introduction - Types of smart materials -self healing material - shape memory Alloys and uses of smart materials.								



**Text Books:**

1. P.C. Jain and M. Jain, Engineering Chemistry, 15/e, Dhanapat Rai & Sons, Delhi, 2014.
2. B.K. Sharma, Engineering Chemistry, Krishna Prakashan, Meerut.
3. O G Palanna, Engineering Chemistry, Tata McGraw Hill, 2009.

**Reference Books:**

1. Sashichawla, A Textbook of Engineering Chemistry, Dhanapath Rai and sons, 2003.
2. Engineering Chemistry (NPTEL Web-book), 11<sup>th</sup> edition by B.L. Tembe, Kamaluddin and M.S. Krishnan.
3. B.S Murthy and P. Shankar, A Text Book of NanoScience and NanoTechnology, University Press, 2013
4. V. Raghavan, A Material Science and Engineering, Prentice-Hall India Ltd, 2004
5. K. Sessa Maheshwaramma and Mridula Chugh, Engineering Chemistry, Pearson India Edn services, 2016. S.S. Dara, A Textbook of Engineering Chemistry, S.Chand & Co, 2010

**Web references:**

1. <https://www.scribd.com/document/23180395/Engineering-Chemistry-Unit-I-Water-Treatment>
2. <https://chem.pg.edu.pl/documents/175289/4235721/Electrochemistry-supplement%20text.pdf>
3. <https://www.nano.gov/you/nanotechnology-benefits>

**E -Text Books:**

1. <http://www.freebookcentre.net/Chemistry/Chemistry-Books-Online.html>
2. <http://www.freebookcentre.net/Chemistry/ElectroChemistry-Books-Download.html>
3. <http://www.freebookcentre.net/Chemistry/Materials-Chemistry-Books.html>
4. <http://www.freebookcentre.net/Chemistry/Polymer-Chemistry-Books.html>
5. <http://www.freebookcentre.net/chemistry-books-download/Engineering-Chemistry-by-Bharath-Institute-of-Science-and-Technology.html>

**MOOCS Course:**

1. <http://nptel.ac.in/courses/122101001/34>
2. <https://ocw.mit.edu/courses/chemistry/>

**Course Outcomes**

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

1. Analyze the parameters of various water samples then compare and conclude better water treatment.
2. Make use of the basic concepts to develop electrochemical cells, photovoltaic cell.
3. Apply the Redox principles for construction of batteries.
4. Apply the methods of metal finishing in solving corrosion related problems.
5. Select the advanced materials and provide their relevance in the respective engineering fields

## PROGRAMMING FOR PROBLEM SOLVING

<b>I B.TECH I SEMESTER-ECE</b>								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
<b>A5CS01</b>	<b>ESC</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		3	-	-	3	30	70	100
<b>Contact Classes: 64</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 64</b>			
<b>Course Objectives</b>								
<ol style="list-style-type: none"> <li>1. To impart basic knowledge about simple algorithms for arithmetic and logical problems.</li> <li>2. To understand how to write a program, syntax and logical errors.</li> <li>3. To enable them how to implement conditional branching, iteration and recursion.</li> <li>4. To understand how to decompose a problem into functions and synthesize a complete program.</li> <li>5. To enable them to use arrays, pointers, strings and structures in solving problems.</li> <li>6. To understand how to solve problems related to matrices, Searching and sorting.</li> <li>7. To make them to understand the use files to perform read and write operations.</li> </ol>								
<b>UNIT-I</b>	<b>INTRODUCTION</b>						<b>Classes: 12</b>	
<p><b>Introduction to Programming:</b> Computer system, computer languages, creating and running programs, Algorithms, flowcharts.</p> <p><b>Introduction to C language:</b> History of C, basic structure of C programs, C tokens, keywords, identifiers, constants, strings, special symbols, variables, data types, I/O statements.</p>								
<b>UNIT-II</b>	<b>OPERATORS, EXPRESSIONS AND CONTROL STRUCTURES</b>						<b>Classes: 15</b>	
<p><b>Operators and expressions:</b> Operators, arithmetic, relational and logical, assignment operators, increment and decrement operators, bitwise and conditional operators, special operators, operator precedence and associativity, evaluation of expressions, type conversions in expressions.</p> <p><b>Control structures:</b> Decision statements; if and switch statement; Loop control statements: while, for and do while loops, jump statements, break, continue, go to statements.</p>								
<b>UNIT-III</b>	<b>ARRAYS AND FUNCTIONS</b>						<b>Classes: 17</b>	
<p><b>Arrays:</b> Concepts, One dimensional array, declaration and initialization of one dimensional arrays, two dimensional arrays, initialization and accessing, multi dimensional arrays, Basic Searching Algorithms: Linear and Binary search</p> <p><b>Functions:</b> User defined and built-in Functions, storage classes, Parameter passing in functions, call by value, call by reference, Passing arrays to functions, Recursion as a different way of solving problems. Example programs, such as Finding Factorial, Fibonacci series, Towers of Hanoi etc.</p>								
<b>UNIT-IV</b>	<b>STRINGS AND POINTERS</b>						<b>Classes: 10</b>	
<p><b>Strings:</b> Arrays of characters, variable length character strings, inputting character strings, character library functions, string handling functions.</p> <p><b>Pointers:</b> Pointer basics, pointer arithmetic, pointers to pointers, generic pointers, array of pointers, functions returning pointers, Dynamic memory allocation.</p>								
<b>UNIT-V</b>	<b>STRUCTURES AND FILE HANDLING</b>						<b>Classes: 10</b>	
<p><b>Structures and unions:</b> Structure definition, initialization, accessing structures, nested structures, arrays of structures, structures and functions, self-referential structures, unions, type def, enumerations.</p> <p><b>File handling:</b> command line arguments, File modes, basic file operations read, write and append, example programs</p>								

**Text Books:**

1. Byron Gottfried, "Programming with C", Schaum's Outlines Series, McGraw Hill Education, 3<sup>rd</sup> edition, 2017.
2. E. Balagurusamy, "Programming in ANSI C", McGraw Hill Education, 6<sup>th</sup> Edition, 2012.

**Reference Books:**

1. W. Kernighan Brian, Dennis M. Ritchie, "The C Programming Language", PHI Learning, 2<sup>nd</sup> Edition, 1988.
2. Yashavant Kanetkar, "Exploring C", BPB Publishers, 2<sup>nd</sup> Edition, 2003.
3. Schildt Herbert, "C: The Complete Reference", Tata McGraw Hill Education, 4<sup>th</sup> Edition, 2014.
4. R. S. Bichkar, "Programming with C", Universities Press, 2<sup>nd</sup> Edition, 2012.
5. Dey Pradeep, Manas Ghosh, "Computer Fundamentals and Programming in C", Oxford University Press, 2<sup>nd</sup> Edition, 2006.
6. Stephen G. Kochan, "Programming in C", Addison-Wesley Professional, 4<sup>th</sup> Edition, 2014.
7. B. A. Forouzan, R. F. Gillberg, "C Programming and Data Structures", Cengage Learning, India, 3<sup>rd</sup> Edition, 2014.

**Web References:**

1. <https://www.bfoit.org/itp/Programming.html>
2. <https://www.khanacademy.org/computing/computer-programming>
3. <https://www.edx.org/course/programming-basics-iitbombayx-cs101-1x-0>
4. <https://www.edx.org/course/introduction-computer-science-harvardx-cs50x>

**E-Text Books:**

1. <http://www.freebookcentre.net/Language/Free-C-Programming-Books-Download.htm>
2. <http://www.imada.sdu.dk/~svalle/courses/dm14-2005/mirror/c/>
3. <http://www.enggnotebook.weebly.com/uploads/2/2/7/1/22718186/ge6151-notes.pdf>

**MOOC Course**

1. [https://onlinecourses.nptel.ac.in/noc18\\_cs33/preview](https://onlinecourses.nptel.ac.in/noc18_cs33/preview)
2. <https://www.alison.com/courses/Introduction-to-Programming-in-c>
3. <http://www.ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-s096-effective-programming-in-c-and-c-january-iap-2014/index.htm>

**Course Outcomes**

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

1. Formulate simple algorithms for arithmetic and logical problems.
2. Test and execute the programs and correct syntax and logical errors.
3. Implement conditional branching, iteration and recursion.
4. Decompose a problem into functions and synthesize a complete program.
5. Use arrays, pointers, strings and structures to formulate algorithms and programs.
6. Apply programming to solve problems related to matrices, Searching and sorting. Use files to perform read and write operations.

## COMMUNICATIVE ENGLISH

I B.TECH I SEM : ECE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
A5HS01	HSMC	L	T	P	C	CIE	SEE	Total
		2	0	0	2	30	70	100
Contact Classes: 32	Tutorial Classes: 0	Practical Classes: 00			Total Classes: 32			
<b>OBJECTIVES:</b> <b>Student will be able to:</b> <ol style="list-style-type: none"> <li>1. Develop language proficiency with emphasis on Vocabulary, Grammar, Reading and Writing skills.</li> <li>2. Apply the theoretical and practical components of English syllabus to study academic subjects more effectively and critically.</li> <li>3. Analyze a variety of texts and interpret them to demonstrate in writing or speech.</li> <li>4. Write/ compose clearly and creatively, and adjust writing style appropriately to the content, the context, and nature of the subject.</li> <li>5. Develop language components to communicate effectively in formal and informal situations.</li> </ol>								
<b>UNIT-I</b>						<b>Classes: 06</b>		
Reading Skills: "Of Studies" by Francis Bacon- Reading for comprehension Writing Skills: Punctuation, Writing Paragraphs Grammar: Word Families- Nouns, Pronouns, Verbs, Adjectives, Adverbs Vocabulary: The concept of Word Formation, Prefixes and Suffixes								
<b>UNIT-II</b>						<b>Classes: 07</b>		
Reading Skills: "Scientist in Training: The Oxford Years" Stephen Hawking's Biography- Making Inferences Writing Skills: Letter Writing- Letters of Request, Apology and Complaint- Letter of Application with Resume Grammar: Sentence Structures, Tenses Vocabulary: Synonyms and Antonyms, Standard Abbreviations								
<b>UNIT-III</b>						<b>Classes: 07</b>		
Reading Skills: "The Teenage Years' by Sarah Gray- Reading Techniques Writing Skills: Essay writing and Describing Objects, Places and Events Grammar: Preposition, Conjunctions, Articles Vocabulary: Idioms and Phrasal verbs, Technical Vocabulary.								
<b>UNIT-IV</b>						<b>Classes: 06</b>		
Reading Skills: "Unlock Your Own Creativity" by Robert Von Oech- Skimming and Scanning of the Text. Writing Skills: Technical Report Writing, E-mail writing, Picture Essay Grammar: Direct and Indirect Speech, Active and passive Voice Vocabulary: One word Substitutes, Words often confused								

<b>UNIT-V</b>		<b>Classes: 06</b>
<p>Reading Skills: "A Talk on Advertising" by Herman Wouk- Intensive and Extensive Reading          Writing Skills: Memo, Précis and Resume Writing          Grammar: Common Errors in English, Subject Verb Agreement (Concord)          Vocabulary: Misplaced Modifiers, Redundancies</p>		
<p><b>Text Books:</b>          1. Michael Swan. Practical English Usage. Oxford University Press. 2017.          2. Wren &amp; Martin. High School English Grammar and Composition Book. S Chand Publishing. 2017</p>		
<p><b>Reference Books:</b>          1. Murphy, R. (2015). Essential Grammar in Use. Cambridge University Press.          2. Wood, F.T. (2007). Remedial English Grammar. Macmillan.          3. Kumar, S and Lata, P. (2018). Communication Skills. Oxford University Press.          4. Zisser, William. (2001). On Writing Well. Harper Resource Book.          5. Hamp-Lyons, L. (2006). Study Writing. Cambridge University Press.</p>		
<p><b>Web References:</b>          1. <a href="http://www.bbc.co.uk/learningenglish">http://www.bbc.co.uk/learningenglish</a>          2. <a href="http://learnenglish.britishcouncil.org">http://learnenglish.britishcouncil.org</a>          3. <a href="https://www.cambridgeenglish.org/learning-english/">https://www.cambridgeenglish.org/learning-english/</a>          4. <a href="https://study.com/academy/subj/english.html">https://study.com/academy/subj/english.html</a>          5.</p>		
<p><b>E-Text Books:</b>          1. <a href="https://www.pdfdrive.com/advanced-english-books.html">https://www.pdfdrive.com/advanced-english-books.html</a></p>		
<p><b>MOOC Course</b>          1. <a href="http://nptel.ac.in/courses/109/106/109106067">http://nptel.ac.in/courses/109/106/109106067</a>          2. <a href="https://www.britishcouncil.org/tr/en/english/mooc">https://www.britishcouncil.org/tr/en/english/mooc</a></p>		
<p><b>Course Outcomes:</b>          By the end of this course, students will be able to:          1. Construct sentences by using appropriate parts of speech.          2. Write letters/paragraphs/reports etc for meaningful professional communication.          3. Make use of appropriate vocabulary in both written and spoken contexts.          4. Comprehend and analyze different levels of written documents.          5. Analyze and correct common errors in spoken and written forms.</p>		

## PROGRAMMING FOR PROBLEM SOLVING LABORATORY

<b>I B.TECH I SEM : ECE</b>									
Course Code	Category	Hours / Week			Credits	Maximum Marks			
A5CS02	ESC	L	T	P	C	CIA	SEE	Total	
		-	-	4	2	30	70	100	
<b>Contact Classes: Nil</b>		<b>Tutorial Classes: Nil</b>		<b>Practical Classes: 36</b>			<b>Total Classes:36</b>		
<b>COURSE OBJECTIVES:</b>									
<ol style="list-style-type: none"> <li>1. To understand how to formulate the algorithms for simple problems</li> <li>2. To be able to translate given algorithms to a working and correct program</li> <li>3. To make them understand how to correct syntax errors as reported by the compilers</li> <li>4. To be able to identify and correct logical errors encountered at run time</li> <li>5. To understand how to write iterative as well as recursive programs</li> <li>6. To enable them to represent data in arrays, strings and structures</li> <li>7. To impart the knowledge of declare pointers of different types and their usage.</li> <li>8. To understand how to create, read and write to and from simple text files.</li> </ol>									
<b>LIST OF EXPERIMENTS</b>									
<b>Week-1</b>	<b>INTRODUCTION TO LINUX COMMANDS</b>								
<ol style="list-style-type: none"> <li>a. Basic Linux commands</li> <li>b. Write a C program to use printf() and scanf() functions</li> <li>c. Write C programs to implement basic arithmetic operations – sum, average, product, difference, quotient and remainder of given numbers etc.</li> </ol>									
<b>Week-2</b>	<b>OPERATORS AND EVALUATION OF EXPRESSIONS</b>								
<ol style="list-style-type: none"> <li>a. Write a C program to check whether a number is even or odd using ternary operator.</li> <li>b. Write a C program to perform the addition of two numbers without using +operator.</li> <li>c. Write a C program to evaluate the arithmetic expression <math>((a + b / c * d - e) * (f - g))</math>. Read the values a, b, c, d, e, f, g from the standard input device.</li> <li>d. Write a C program to find the sum of individual digits of a 3 digit number.</li> <li>e. Write a C program to read the values of x and y and print the results of the following expressions in one line:               <ol style="list-style-type: none"> <li>i. <math>(x + y) / (x - y)</math></li> <li>ii. <math>(x + y)(x - y)</math></li> </ol> </li> </ol>									
<b>Week-3</b>	<b>CONDITIONAL STATEMENTS</b>								
<ol style="list-style-type: none"> <li>a. Write a C program to find largest and smallest of given numbers.</li> <li>b. Write a C program to find roots of a quadratic equation.</li> <li>c. Write a C program which takes two integer operands and one operator from the user(+, -, *, /, % use switch)</li> </ol>									
<b>Week-4</b>	<b>LOOPING STATEMENTS</b>								

	<ul style="list-style-type: none"> <li>a. Write a C program to find Sum of individual digits of given integer</li> <li>b. Write a C program to generate first n terms of Fibonacci series</li> <li>c. Write a C program to generate prime numbers between 1 and n</li> </ul>
<b>Week-5</b>	<b>LOOPING STATEMENTS</b>
	<ul style="list-style-type: none"> <li>a. Write a C Program to find the Sum of Series <math>SUM=1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!</math></li> <li>b. Write a C program to generate Pascal's triangle.</li> <li>c. Write a C program to generate pyramid of numbers.</li> </ul> <pre style="text-align: center;"> 1   1  3  1  1  3  5  3  1                     </pre>
<b>Week-6</b>	<b>ARRAYS</b>
	<ul style="list-style-type: none"> <li>a. Write a C Program to implement following searching methods <ul style="list-style-type: none"> <li>i. Binary Search</li> <li>ii. Linear Search</li> </ul> </li> <li>b. Write a C program to find largest and smallest number in a list of integers</li> </ul>
<b>Week-7</b>	<b>ARRAYS</b>
	<ul style="list-style-type: none"> <li>a. Write a C program <ul style="list-style-type: none"> <li>i. To add two matrices</li> <li>ii. To multiply two matrices</li> </ul> </li> <li>b. Write a C program to find Transpose of a given matrix</li> </ul>
<b>Week-8</b>	<b>FUNCTIONS</b>
	<ul style="list-style-type: none"> <li>a. Write a C program to find the factorial of a given integer using functions</li> <li>b. Write a C program to find GCD of given integers using functions</li> <li>c. Write a C Program to find the power of a given number using functions</li> </ul>
<b>Week-9</b>	<b>RECURSION</b>
	<ul style="list-style-type: none"> <li>a. Write a C Program to find binary equivalent of a given decimal number using recursive functions.</li> <li>b. Write a C Program to print Fibonacci sequence using recursive functions.</li> <li>c. Write a C Program to find LCM of 3 given numbers using recursive functions</li> </ul>
<b>Week-10</b>	<b>STRINGS</b>
	<ul style="list-style-type: none"> <li>a. Write a C program using functions to <ul style="list-style-type: none"> <li>a. Insert a sub string into a given main string from a given position</li> <li>b. Delete n characters from a given position in a string</li> </ul> </li> <li>b. Write a C program to determine if given string is palindrome or not</li> </ul>
<b>Week-11</b>	<b>POINTERS AND STRUCTURES</b>

<ol style="list-style-type: none"> <li>a. Write a C program to print 2-D array using pointers</li> <li>b. Write a C program to allocate memory dynamically using memory allocation functions (malloc, calloc, realloc, free)</li> <li>c. Write a C Program using functions to             <ol style="list-style-type: none"> <li>a. Reading a complex number</li> <li>b. Writing a complex number</li> <li>c. Add two complex numbers</li> <li>d. Multiply two complex numbers</li> </ol> </li> <li>d. Note: represent complex number using structure.</li> </ol>	
<b>Week-12</b>	<b>FILES</b>
<ol style="list-style-type: none"> <li>a. Write a C program to copy one file to other</li> <li>b. Write a C program to copy one file to other</li> <li>c. Write a C Program to merge two files into a third file</li> </ol>	
<b>Text Books:</b>	
<ol style="list-style-type: none"> <li>1. Yashavant Kanetkar, "Let Us C", BPB Publications, New Delhi, 13<sup>th</sup> Edition, 2012.</li> <li>2. Oualline Steve, "Practical C Programming", O'Reilly Media, 3<sup>rd</sup> Edition, 1997.</li> </ol>	
<b>Reference Books:</b>	
<ol style="list-style-type: none"> <li>1. King KN, "C Programming: A Modern Approach", Atlantic Publishers, 2<sup>nd</sup> Edition, 2015.</li> <li>2. Kochan Stephen G, "Programming in C: A Complete Introduction to the C Programming Language", Sam's Publishers, 3<sup>rd</sup> Edition, 2004.</li> <li>3. Linden Peter V, "Expert C Programming: Deep C Secrets", Pearson India, 1<sup>st</sup> Edition, 1994.</li> </ol>	
<b>Web References:</b>	
<ol style="list-style-type: none"> <li>1. <a href="http://www.sanfoundry.com/c-programming-examples">http://www.sanfoundry.com/c-programming-examples</a></li> <li>2. <a href="http://www.geeksforgeeks.org/c">http://www.geeksforgeeks.org/c</a></li> <li>3. <a href="http://www.cprogramming.com/tutorial/c">http://www.cprogramming.com/tutorial/c</a></li> <li>4. <a href="http://www.cs.princeton.edu">http://www.cs.princeton.edu</a></li> </ol>	
<b>COURSE OUTCOMES:</b>	
<b>At the end of the course, student will be able to</b>	
<ul style="list-style-type: none"> <li>• Formulate the algorithms for simple problems</li> <li>• Translate given algorithms to a working and correct program</li> <li>• Correct syntax errors as reported by the compilers</li> <li>• Identify and correct logical errors encountered at run time</li> <li>• Write iterative as well as recursive programs</li> <li>• Represent data in arrays, strings and structures and manipulate them through a program</li> <li>• Declare pointers of different types and use them in defining self-referential structures.</li> <li>• Create, read and write to and from simple text files.</li> </ul>	



## ENGINEERING CHEMISTRY LABORATORY

I B.TECH I SEM : ECE								
Course Code:	Category	Hours / Week			Credits	Maximum Marks		
A5BS14	BSC	L	T	P	C	CIA	SEE	Total
		0	0	3	2	30	70	100
<b>Contact Classes: 00</b>	<b>Tutorial Classes: 00</b>	<b>Practical Classes: 39</b>			<b>Total Classes: 39</b>			
<p><b>Course Objectives</b></p> <p>The course should enable the students to:</p> <ol style="list-style-type: none"> <li>I. Estimation of hardness, alkalinity and chloride content in water to check its suitability for drinking and industrial purposes.</li> <li>II. Estimation of metal oxide in construction material.</li> <li>III. The measurement of physical properties like adsorption and viscosity.</li> <li>IV. To demonstrate the digital and instrumental methods of analysis.</li> </ol>								
<b>LIST OF EXPERIMENTS</b>								
<b>WEEK -1</b>	DETERMINATION OF TOTAL HARDNESS OF WATER BY COMPLEXOMETRIC METHOD USING EDTA							
<b>WEEK-2</b>	DETERMINATION OF ALKALINITY OF GIVEN WATER SAMPLE							
<b>WEEK-3</b>	DETERMINATION OF CHLORIDE CONTENT OF WATER USING ARGENTOMETRIC METHOD							
<b>WEEK-4</b>	ESTIMATION OF AN HCL BY CONDUCTOMETRIC TITRATIONS							
<b>WEEK-5</b>	ESTIMATION OF ACETIC ACID BY CONDUCTOMETRIC TITRATIONS							
<b>WEEK-6</b>	REDOX TITRATIONS BY POTENTIOMETRY							
<b>WEEK-7</b>	SYNTHESIS OF THIOKOL RUBBER							

## ENGLISH LANGUAGE AND COMMUNICATION SKILLS

<b>I B.TECH I SEM :ECE</b>									
Course Code	Category	Hours / Week			Credits	Maximum Marks			
<b>A5HS02</b>	<b>HSMC</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIE</b>	<b>SEE</b>	<b>Total</b>	
		0	0	3	2	30	70	100	
<b>Contact Classes: 00</b>	<b>Tutorial Classes: 00</b>	<b>Practical Classes: 39</b>			<b>Total Classes: 39</b>				
<p><b>OBJECTIVES:</b>  <b>The course should enable the students to:</b></p> <ol style="list-style-type: none"> <li>1. Facilitate computer-assisted multi-media instruction enabling individualized and independent language learning.</li> <li>2. Enhance English language skills, communication skills and to practice soft skills.</li> <li>3. Improve fluency and pronunciation intelligibility by providing an opportunity for practice in speaking.</li> <li>4. Get trained in different interview and public speaking skills such as JAM, debate, role play, group discussion etc.</li> <li>5. Instill confidence and make them competent enough to express fluently and neutralize their mother tongue influence.</li> </ol>									
<b>LIST OF ACTIVITIES</b>									
<b>Week-1</b>	<b>GENERAL INTRODUCTIONS AND FORMAL GREETINGS</b>								
<ol style="list-style-type: none"> <li>a. Introductions and greetings in formal and informal situations</li> <li>b. Worksheets to extract information</li> <li>c. Questionnaires to enquire about the expressions used during formal introductions</li> <li>d. Ice Breaking activity by preparing and asking five questions each</li> <li>e. Creation of dialogues using greetings, leave- taking and introductions</li> </ol>									
<b>Week-2</b>	<b>JAM- JUST A MINUTE</b>								
<ol style="list-style-type: none"> <li>a. Strengthen the ability to analyze a topic and logical organization of thoughts.</li> <li>b. Logically starting with introductory sentence, points of discussion and closing sentence.</li> <li>c. Practicing to speak within one minute</li> <li>d. Activity based on JAM on a familiar topic</li> <li>e. Planning and executing JAM considering the parameters</li> </ol>									
<b>Week-3</b>	<b>LISTENING SKILLS</b>								
<ol style="list-style-type: none"> <li>a. Developing good listening skills for effective communication</li> <li>b. Enhancing listening skills through audio tracks and oral conversation</li> <li>c. Empathizing others point of view while they speak</li> <li>d. Incorporating non verbal communications while listening</li> <li>e. Improving overall performance listening to the audio tracks</li> </ol>									

<b>Week-4</b>	<b>PHONETICS</b>
	<ul style="list-style-type: none"> <li>a. Speech sounds and their prominence in pronunciation</li> <li>b. Understanding and practicing word stress</li> <li>c. Neutralizing the accent and practicing the right intonation</li> <li>d. Knowing the differences between different accents</li> <li>e. Increase fluency with the help of Phonetics</li> </ul>
<b>Week-5</b>	<b>SITUATIONAL DIALOGUES AND GIVING DIRECTIONS</b>
	<ul style="list-style-type: none"> <li>a. Creating dialogues in any given situations</li> <li>b. Framing and choosing appropriate words to frame the dialogues in any situation</li> <li>c. Guiding and giving directions using appropriate expressions</li> <li>d. Activities on how to make polite requests, offers, rejections etc</li> <li>e. Practicing to speak confidently in different situations</li> </ul>
<b>Week-6</b>	<b>ROLE PLAY</b>
	<ul style="list-style-type: none"> <li>a. Understanding a Role play and its procedure</li> <li>b. Planning and Executing a Role Play accordingly</li> <li>c. Practicing to get into the role and perform within stipulated time</li> <li>d. Activities based on Role Play with different situations</li> <li>e. Performing a Role Play considering the parameters</li> </ul>
<b>Week-7</b>	<b>GROUP DISCUSSIONS</b>
	<ul style="list-style-type: none"> <li>a. Understanding a Group Discussion (GD) and its procedure</li> <li>b. Following the rules of a GD</li> <li>c. Planning and Executing a GD within the stipulated time</li> <li>d. Activities based on GD</li> <li>e. Performing a GD considering the parameters</li> </ul>
<b>Week-8</b>	<b>DEBATE</b>
	<ul style="list-style-type: none"> <li>a. Understanding the procedure of a Debate</li> <li>b. Planning and executing a Debate following its rules <ul style="list-style-type: none"> <li>c. Strengthen the ability to analyze a topic and logical organization of thoughts.</li> <li>d. Logically arranging the arguments</li> </ul> </li> <li>e. Performing a Debate considering the parameters</li> </ul>
<b>Week-9</b>	<b>TELEPHONIC ETIQUETTES</b>
	<ul style="list-style-type: none"> <li>a. Understanding basic Telephonic Etiquettes</li> <li>b. The approach one needs to follow while making and answering a call</li> <li>c. Making a formal telephonic conversation</li> <li>d. Activities based on modulating voice and tone</li> <li>e. Interpersonal skills required to overcome rude and hostile behavior</li> </ul>
<b>Week-10</b>	<b>PRESENTATION SKILLS</b>
	<ul style="list-style-type: none"> <li>a. Planning a Presentation</li> <li>b. Enhancing skills required for making effective presentations</li> <li>c. Usage of different tools that help us to give effective presentations</li> <li>d. Executing a presentation effectively</li> <li>e. Activities based on presentations</li> </ul>

<b>Week-11</b>	<b>ORAL PRESETATIONS AND EXTEMPORE</b>
	<ul style="list-style-type: none"> <li>a. Planning an oral presentation or an Extempore</li> <li>b. Preparing good PPT</li> <li>c. Using appropriate body language in public speaking domain</li> <li>d. Planning and Executing oral presentation</li> <li>e. Activities based on oral presentations and extempore</li> </ul>
<b>Week-12</b>	<b>INTERVIEW SKILLS</b>
	<ul style="list-style-type: none"> <li>a. Preparing to succeed in Interviews</li> <li>b. Preparing a strong Resume for interviews</li> <li>c. Practicing different techniques to overcome nervousness in interviews</li> <li>d. Using appropriate body language in interviews</li> <li>e. Activities based on Interviews skills</li> </ul>
<b>Week-13</b>	<b>INFORMATION TRANSFER</b>
	<ul style="list-style-type: none"> <li>a. Extracting Information Transfer from different kinds of representation</li> <li>b. Reading and decoding the information given in various types</li> <li>c. Representing the information in charts or graphs in a written document</li> <li>d. Developing writing skills from these aspects</li> <li>e. Activity on transferring given data into graphs or charts for presentation skills</li> </ul>
<b>Reference Books:</b>	
<ol style="list-style-type: none"> <li>1. Whitby, N. Business Benchmark. Cambridge University Press (with CD) 2<sup>nd</sup> Edition.</li> <li>2. Kumar, S. &amp; Lata, P. (2011). Communication Skills. Oxford University Press.</li> <li>3. Balasubramanian, T. (2008). A Text book of English Phonetics for Indian Students, Macmillan.</li> <li>4. Thorpe, E. (2006). Winning at Interviews, Pearson Education.</li> <li>5. Sethi, J. et al. (2005). A Practical Course in English Pronunciation (with CD), Prentice Hall of India.</li> </ol>	
<b>Websites:</b>	
<p> <a href="https://www.britishcouncil.org">https://www.britishcouncil.org</a>  <a href="https://www.bbc.co.uk">https://www.bbc.co.uk</a>  <a href="https://www.grammarly.com">https://www.grammarly.com</a>  <a href="https://www.fluentu.com">https://www.fluentu.com</a>  <a href="https://www.cambridgeenglish.org/exams-and-tests/business-preliminary">https://www.cambridgeenglish.org/exams-and-tests/business-preliminary</a>  <a href="https://www.cambridgeenglish.org/exams-and-tests/business-vantage">https://www.cambridgeenglish.org/exams-and-tests/business-vantage</a> </p>	
<b>OUTCOMES:</b>	
<b>By the end of the course students will be able to</b>	
<ul style="list-style-type: none"> <li>a) Develop better perception of nuances of English language through audio- visual experience.</li> <li>b) Acquire Neutralization of accent for intelligibility.</li> <li>c) Participate in group activities.</li> <li>d) Employ speaking skills with clarity and confidence which in turn enhances their employability.</li> </ul>	

