

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI****(AUTONOMOUS)  
COMPUTER SCIENCE AND ENGINEERING (CSE)  
(Effective for the batches admitted in 2020-21)****Semester I (First year)**

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	BS	20ABS9901	Algebra & Calculus	3	0	0	3	30	70	100
2	BS	20ABS9904	Chemistry	3	0	0	3	30	70	100
3	ES	20AES0501	Problem Solving and Programming	3	0	0	3	30	70	100
4	ES	20AES0301	Engineering Graphics	1	0	4	3	30	70	100
5	ES	20AES0505	Information Technology and Numerical Methods	3	0	0	3	30	70	100
6	ES LAB	20AES0506	Computer Science and Engineering Workshop	0	0	3	1.5	30	70	100
7	BS LAB	20ABS9909	Chemistry Lab	0	0	3	1.5	30	70	100
8	ES LAB	20AES0503	Problem Solving and Programming Lab	0	0	3	1.5	30	70	100
<b>Total credits</b>							<b>19.5</b>	<b>240</b>	<b>560</b>	<b>800</b>

Course Code	Algebra and Calculus		L	T	P	C
20ABS9901			3	0	0	3
<b>Pre-requisite</b>	<b>Matrices</b>	<b>Semester</b>	<b>I - I</b>			
<b>Course Outcomes (CO):</b>						
<b>CO1:</b> Make use of matrix algebra techniques that is needed by engineers for practical application <b>CO2:</b> Utilize mean value theorems to real life problems. <b>CO3:</b> Interpret with functions of several variables which is useful in optimization. Variables which is useful in optimization. <b>CO4:</b> Analyze 2-dimensional and 3- dimensional concepts in coordinate systems <b>CO5:</b> utilize the concept of special functions.						
<b>UNIT – I</b>	<b>Matrix Operations and Solving Systems of Linear Equations</b>		12 Hrs			
Rank of a matrix by echelon form, solving system of homogeneous and non-homogeneous equations linear equations. Eigen values and Eigen vectors and their properties, Cayley-Hamilton theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton theorem						
<b>UNIT – II</b>	<b>Quadratic Forms and Mean Value Theorems</b>		9 Hrs			
Diagonalisation of a matrix, quadratic forms and nature of the quadratic forms, reduction of quadratic form to canonical forms by orthogonal transformation. Rolle's Theorem, Lagrange's mean value theorem, Cauchy's mean value theorem, Taylor's and Maclaurin's theorems with remainders (without proof);						
<b>UNIT – III</b>	<b>Multivariable calculus</b>		9 Hrs			
Partial derivatives, total derivatives, chain rule, change of variables, Jacobians, maxima and minima of functions of two variables, method of Lagrange multipliers.						
<b>UNIT – IV</b>	<b>Multiple Integrals</b>		10 Hrs			
Double integrals, change of order of integration, double integration in polar coordinates, change of Variables in double integration (Cartesian to polar), areas enclosed by plane curves. Evaluation of triple integrals.						
<b>UNIT – V</b>	<b>Special Functions</b>		10 Hrs			
Beta and Gamma functions and their properties, relation between beta and gamma functions, Bessel functions, Bessel's equation, Recurrence formulae or $J_n(x)$ , Generating function- Orthogonality of Bessel's functions.						
<b>Textbooks:</b>						
1. B. S. Grewal, Higher Engineering Mathematics, 44/e, Khanna Publishers, 2017. 2. Erwin Kreyszig, Advanced Engineering Mathematics, 10/e, John Wiley & Sons, 2011.						
<b>Reference Books:</b>						
1. Dr.T.K.V Iyengar, B.Krishna Gandhi, S. Ranganatham and M.V.S.S.N Prasad, Mathematics – 1, S.Chand publications. 2. R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics, 3/e, Alpha Science International Ltd., 2002. 3. B.V.Ramana, Higher Engineering Mathematics, Mc Graw Hill Education. 4. N.Bali, M.Goyal, C.Watkins, Advanced Engineering Mathematics, Infinity Science Press.						

#### Mapping of course outcomes with program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3													
CO2	3													
CO3	3													
CO4		3												
CO5		3												

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

Course Code	Chemistry		L	T	P	C
20ABS9904			3	0	0	3
Pre-requisite	Basics of chemical formulas and equations	Semester	I - I			
<b>Course Outcomes (CO):</b>						
<p><b>CO1:</b> Interpret the behaviour and interactions between matter and energy at both the atomic and molecular levels between matter and energy at both the atomic and molecular levels</p> <p><b>CO2:</b> Apply the electrochemical principles to the construction of batteries, fuel cells and electrochemical sensors</p> <p><b>CO3:</b> Outline the preparation, mechanism properties and applications of polymer and conducting polymer</p> <p><b>CO4:</b> Analyze the separation of gaseous and liquid mixtures using instrumental methods and their applications</p> <p><b>CO5:</b> Understand the disadvantages of using hardwater in domestically and industrially and select suitable treatment</p>						
<b>UNIT – I</b>	<b>Structure and Bonding Models</b>		10 Hrs			
Planck's quantum theory, Schrodinger wave equation, significance of $\Psi^1$ and $\Psi^2$ , applications to hydrogen, particle in a box and their applications for conjugated molecules, crystal field theory – salient features – energy level diagrams for transition metal ions – splitting of orbital's in tetrahedral and octahedral complexes, magnetic properties, molecular orbital theory – bonding in homo- and heteronuclear diatomic molecules – energy level diagrams of $O_2$ , $N_2$ and CO, calculation of bond order.						
<b>UNIT – II</b>	<b>Electrochemistry and Applications</b>		10 Hrs			
<p>Electrodes – concepts, reference electrodes (Calomel electrode, Ag/AgCl electrode and glass electrode) electrochemical cell, Nernst equation, cell potential calculations, numerical problems, concept of pH, pH meter and applications of pH metry (acid-base titrations), potentiometry- potentiometric titrations (redox titrations), concept of conductivity, conductivity cell, conductometric titrations (acid-base titrations), photovoltaic cell – working and applications, photogalvanic cells with specific examples. Electrochemical sensors – potentiometric sensors with examples, amperometric sensors with examples.</p> <p><b>Primary cells</b> – Zinc-air battery, alkali metal sulphide batteries, button cells, Fuel cells, hydrogen-oxygen, methanol fuel cells – working of the cells.</p> <p><b>Secondary cells</b> – lead acid, nickel-metal hydride and lithium ion batteries- working of the batteries including cell reactions</p>						
<b>UNIT – III</b>	<b>Polymer Chemistry</b>		10 Hrs			
<p>Introduction to polymers, functionality of monomers, chain growth and step growth polymerization, coordination polymerization, copolymerization (stereospecific polymerization) with specific examples and mechanisms of polymer formation.</p> <p>Plastics - Thermoplastics and Thermo settings, Preparation, properties and applications of – Bakelite, urea-formaldehyde, Nylon-66, carbon fibres, Elastomers–Buna-S, Buna-N–preparation, properties and applications.</p> <p>Conducting polymers – polyacetylene, polyaniline, polypyrroles – mechanism of conduction and applications.</p>						
<b>UNIT – IV</b>	<b>Instrumental Methods and Applications</b>		10 Hrs			
Beer-Lambert's law,, Principle and applications of UV-Visible spectrophotometer, Principle and applications of Colorometry, AAS, AES, Instrumentation, Principles and applications of Chromatographic techniques(GC & HPLC), Methods for separation of gaseous mixtures and liquid mixtures.						
<b>UNIT – V</b>	<b>Water Technology</b>		10 Hrs			
Introduction –Soft Water and hardness of water, Estimation of hardness by EDTA Method - Boiler troubles - scale and sludge, Industrial water treatment – specifications for drinking water, Bureau of Indian Standards(BIS) and World health organization(WHO) standards, zeolite and ion-exchange processes - desalination of brackish water, reverse osmosis (RO) and electrodialysis.						
<b>Textbooks:</b>						
<ol style="list-style-type: none"> <li>1. Jain and Jain, Engineering Chemistry, 16/e, Dhanpat Rai, 2013.</li> <li>2. Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.</li> <li>3. Engineering Chemistry by G V Subba Reddy, K N Jayaveera and C Ramachandraiah, Mc Graw Hill education(India) Private Limited.</li> </ol>						
<b>Reference Books:</b>						
<ol style="list-style-type: none"> <li>1. J. D. Lee, Concise Inorganic Chemistry, 5/e, Oxford University Press, 2008.</li> <li>2. Skoog and West, Principles of Instrumental Analysis, 6/e, Thomson, 2007.</li> <li>3. Ben L. Feringa and Wesley R. Browne, Molecular Switches, 2/e, Wiley-VCH, 2011.</li> <li>4. Willard Merritt Dean Settle, 7 th Edition Instrumental methods for analysis</li> </ol>						

**Mapping of course outcomes with program outcomes**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>CO1</b>	3													
<b>CO2</b>	3				2									
<b>CO3</b>	3		2											
<b>CO4</b>	3				3									
<b>CO5</b>	3		2											

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

Course Code	Problem Solving And Programming		L	T	P	C
20AES0501			3	0	0	3
Pre-requisite	Basic Mathematics	Semester	I - I			
<b>Course Objectives:</b>						
<ul style="list-style-type: none"> <li>• Introduce the internal parts of a computer, and peripherals.</li> <li>• Introduce the Concept of Algorithm and use it to solve computational problems</li> <li>• Identify the computational and non-computational problems</li> <li>• Teach the syntax and semantics of a C Programming language</li> <li>• Demonstrate the use of Control structures of C Programming language</li> <li>• Illustrate the methodology for solving Computational problems</li> </ul>						
<b>Course Outcomes (CO):</b>						
<b>CO1:</b> Able to know interconnection of peripherals and connects of algorithms and flowcharts <b>CO2:</b> Able to know problem solving aspects, design and analysis of algorithm <b>CO3:</b> Able to know flow control, input output and implementation functions <b>CO4:</b> Able to solve computational problems using functions, array and pointers <b>CO5:</b> Able to organise real world heterogeneous data and apply searching ,sorting techniques with exception handling						
<b>UNIT - I</b>						8 Hrs
<b>Computer Fundamentals:</b> What is a Computer, Evolution of Computers, Generations of Computers, Classification of Computers, Anatomy of a Computer, Memory revisited, Introduction to Operating systems, Operational overview of a CPU. Introduction to Programming, Algorithms and Flowcharts: Programs and Programming, Programming languages, Compiler, Interpreter, Loader, Linker, Program execution, Fourth generation languages, Fifth generation languages, Classification of Programming languages, Structured programming concept, Algorithms, Pseudo-code, Flowcharts, Strategy for designing algorithms, Tracing an algorithm to depict logic, Specification for converting algorithms into programs.						
<b>UNIT - II</b>						9 Hrs
<b>Introduction to computer problem solving:</b> Introduction, the problem-solving aspect, top-down design, implementation of algorithms, the efficiency of algorithms, and the analysis of algorithms. <b>Fundamental algorithms:</b> Exchanging the values of two variables, counting, summation of a set of numbers, factorial computation, sine function computation, generation of the Fibonacci sequence, reversing the digits of an integer.						
<b>UNIT - III</b>						8 Hrs
<b>Types, Operators, and Expressions:</b> Variable names, data types and sizes, constants, declarations, arithmetic operators, relational and logical operators, type conversions, increment and decrement operators, bitwise operators, assignment operators and expressions, conditional expressions precedence and order of evaluation. <b>Input and output:</b> standard input and output, formatted output-Printf, formatted input-Scanf. <b>Control Flow:</b> Statements and blocks, if-else, else-if, switch, Loops-while and for, Loops-Do- while, break and continue, Goto and labels. <b>Functions and Program Structure:</b> Basics of functions, functions returning non-integers, external variables, scope variables, header variables, register variables, block structure, initialization, recursion, the C processor.						
<b>UNIT - IV</b>						9 Hrs
<b>Factoring methods:</b> Finding the square root of a number, the smallest divisor of a number, the greatest common divisor of two integers, generating prime numbers. <b>Pointers and arrays:</b> Pointers and addresses, pointers and function arguments, pointers and arrays, address arithmetic, character pointers and functions, pointer array; pointers to pointers, Multi-dimensional arrays, initialization of arrays, pointer vs. multi-dimensional arrays, command line arguments, pointers to functions, complicated declarations. <b>Array Techniques:</b> Array order reversal, finding the maximum number in a set, removal of duplicates from an order array, finding the k <sup>th</sup> smallest element						
<b>UNIT - V</b>						9 Hrs
<b>Sorting and Searching:</b> Sorting by selection, sorting by exchange, sorting by insertion, sorting by partitioning, binary search. <b>Structures:</b> Basics of structures, structures and functions, arrays of structures, pointers to structures, self-referential structures, table lookup, typedef, unions, bit-fields. <b>Some other Features:</b> Variable-length argument lists, formatted input-Scanf, file access, Error handling-stderr and exit, Line Input and Output, Miscellaneous Functions.						
<b>Textbooks:</b>						
<ol style="list-style-type: none"> <li>1. Pradip Dey, and Manas Ghosh, "Programming in C", 2018, Oxford University Press.</li> <li>2. R.G. Dromey, "How to Solve it by Computer". 2014, Pearson.</li> <li>3. Brian W. Kernighan, and Dennis M. Ritchie, "The C Programming Language", 2<sup>nd</sup> Edition, Pearson.</li> </ol>						

<b>Reference Books:</b>
<ol style="list-style-type: none"> <li>1. RS Bichkar “Programming with C”, 2012, Universities Press.</li> <li>2. Pelin Aksoy, and Laura Denardis, “Information Technology in Theory”, 2017, Cengage Learning.</li> <li>3. Byron Gottfried and Jitender Kumar Chhabra, “Programming with C”, 4<sup>th</sup> Edition, 2019, McGraw Hill Education.</li> </ol>
<b>Online Learning Resources:</b>
<a href="http://www.nptel.ac.in">www.nptel.ac.in</a>

**Mapping of course outcomes with program outcomes**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>CO1</b>	2	2											3	
<b>CO2</b>	3	3	2										2	
<b>CO3</b>	2	3	3										2	
<b>CO4</b>	2	1	3	2									2	
<b>CO5</b>	2	1	3	3	2			2				3	2	2

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

<b>Course Code</b>	<b>Engineering Graphics</b>			<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20AES0301				1	0	4	3
<b>Pre-requisite</b>	<b>NIL</b>	<b>Semester</b>		<b>I - I</b>			
<b>Course Outcomes (CO):</b>							
<b>CO1:</b> Ability to discuss the conventions and methods of Engineering Drawing <b>CO2:</b> Ability to demonstrate drafting practices, visualization and projection skills <b>CO3:</b> Ability to perform basic sketching techniques of Engineering components <b>CO4:</b> Ability to draft the orthographic and pictorial views of a given Engineering components <b>CO5:</b> Ability to increasingly use architectural and engineering scales							
<b>UNIT – I</b>					8 Hrs		
<b>Introduction to Engineering graphics:</b> Principles of Engineering Graphics and their significance-Conventions in drawing-lettering - BIS conventions. a) Conic sections including the rectangular hyperbola- general method only, b) Cycloid, epicycloids and hypocycloid							
<b>UNIT – II</b>					9 Hrs		
<b>Projection of points, lines:</b> Projection of points in any quadrant, lines inclined to one or both planes, finding true lengths, angle made by line, traces							
<b>UNIT – III</b>					8 Hrs		
<b>Projections of Planes:</b> Projection of points in any quadrant, lines inclined to one or both planes, finding true lengths, angle made by line. Projections of regular plane surfaces. <b>Projections of Solids:</b> Projections of regular solids inclined to one or both planes by rotational or auxiliary views method.							
<b>UNIT – IV</b>					9 Hrs		
<b>Sections of solids:</b> Section planes and sectional view of right regular solids- prism, cylinder, pyramid and cone. True shapes of the sections. <b>Development of surfaces:</b> Development of surfaces of right regular solids-prism, cylinder, pyramid, cone and their sectional parts.							
<b>UNIT – V</b>					9 Hrs		
<b>Orthographic Projections:</b> Systems of projections, conventions and application to orthographic projections. <b>Isometric Projections:</b> Principles of isometric projection- Isometric scale; Isometric views: lines, planes, figures, simple and compound solids.							
<b>Textbooks and Reference Books:</b>							
K.L.Narayana & P.Kannaiah, Engineering Drawing, 3/e, Scitech Publishers N.D.Bhatt, Engineering Drawing, 53/e, Charotar Publishers Dhanajay A Jolhe, Engineering Drawing, Tata McGraw-Hill Shah and Rana, Engineering Drawing, 2/e, Pearson Education Basant Agarwal & C.M.Agarwal, Engineering Drawing, Tata McGraw-Hill							
<b>Online Learning Resources:</b>							
YouTube: <a href="http://sewor,Carleton.cag,kardos/88403/drawings.html">http://sewor,Carleton.cag,kardos/88403/drawings.html</a> conic sections-online, red woods.edu							

**Mapping of course outcomes with program outcomes**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1													
CO2		3												
CO3	2													
CO4			3											
CO5					1									

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

<b>Course Code</b>	<b>Information Technology And Numerical Methods</b>		<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20AES0505			<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Pre-requisite</b>	<b>Basic Computer Knowledge</b>	<b>Semester</b>	<b>I - I</b>			
<b>Course Outcomes (CO):</b>						
<b>CO1:</b> Usage of Digital World and Exploring Cyber space <b>CO2:</b> Explain the needs of hardware and software required for a computation task. <b>CO3:</b> Peripheral devices, networking and internet concepts						
<b>UNIT - I</b>						8 Hrs
<b>INTRODUCTION TO INFORMATION TECHNOLOGY Your Digital World:</b> The Practical User: How Becoming Computer Savvy Benefits You, Information Technology & Your Life: The Future Now, Infotech Is All Pervasive: Cell phones, Email, the Internet, & the E-World, The "All-Purpose Machine": The Varieties of Computers, Understanding Your Computer: How Can You Customize (or Build) Your Own PC?, Where Is Information Technology Headed? <b>THE INTERNET &amp; THE WORLD WIDE WEB Exploring Cyberspace:</b> Connecting to the Internet: Narrowband, Broadband, & Access Providers, How Does the Internet Work? The World Wide Web, Email & Other Ways of Communicating over the Net, The Online Gold Mine: Telephony, Multimedia, Webcasting, Blogs, E-Commerce, & the Social Web, The Intrusive Internet: Snooping, Spamming, Spoofing, Phishing, Pharming, Cookies, & Spyware.						
<b>UNIT - II</b>						9 Hrs
<b>SOFTWARE Tools for Productivity &amp; Creativity:</b> SOFTWARE: TOOLS FOR PRODUCTIVITY & CREATIVITY, <b>System Software:</b> The Power Behind the Power, The Operating System: What It Does? Other System Software: Device Drivers & Utility Programs, Common Features of the User Interface, Common Operating Systems, Application Software: Getting Started, Word Processing, Spreadsheets, Database Software, Specialty Software <b>HARDWARE:</b> THE CPU & STORAGE How to Choose a Multimedia Computer System: <b>HARDWARE:</b> THE CPU & STORAGE: HOW TO CHOOSE A MULTIMEDIA COMPUTER SYSTEM, Microchips, Miniaturization, & Mobility, the System Unit: The Basics, More on the System Unit, Secondary Storage, Future Developments in Processing & Storage						
<b>UNIT - III</b>						8 Hrs
<b>HARDWARE: INPUT &amp; OUTPUT Taking Charge of Computing &amp; Communications:</b> Input & Output, Input Hardware, Output Hardware, Input & Output Technology & Quality of Life: Health & Ergonomics, The Future of Input & Output <b>COMMUNICATIONS, NETWORKS, &amp; SAFEGUARDS The Wired &amp; Wireless World:</b> From the Analog to the Digital Age, Networks, Wired Communications Media, Wireless Communications Media, Cyber Threats, Hackers, & Safeguards						

**Mapping of course outcomes with program outcomes**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>CO1</b>	3	2			2							2	2	
<b>CO2</b>	3	3	2						2			2	2	
<b>CO3</b>	3	2			2							2		

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

<b>20AES0505</b>	<b>Numerical Methods</b>	
<b>Pre-requisite</b>	<b>Basic Statistics</b>	I-I
<b>Course Outcomes:</b>		
<p><b>CO4:</b> Analyze the concepts of Errors, Algebraic &amp; Transcendental Equations to solve different Engineering problems</p> <p><b>CO5:</b> Analyze Interpolation using the concepts of the numerical methods and apply the Integration in numerical methods</p> <p><b>CO6:</b> Apply the concepts of O.D.E on numerical method</p>		
<b>UNIT – I</b>		8 Hrs
<p><b>Errors in Numerical computations:</b> Errors and their Accuracy, Mathematical Preliminaries, Errors and their Analysis, Absolute, Relative and Percentage Errors, A general error formula, Error in a series approximation.</p> <p><b>Solution of Algebraic and Transcendental Equations:</b> The Bisection Method – The Method of False Position– Newton-Raphson Method, Solution of linear simultaneous equation: Crout’s triangularisation method, Gauss - Seidal iteration method.</p>		
<b>UNIT – II</b>		8 Hrs
<p><b>Interpolation:</b> Newton’s forward and backward interpolation formulae – Lagrange’s formulae. Gauss forward and backward formula, Stirling’s formula, Bessel’s formula.</p> <p><b>Curve fitting:</b> Fitting of a straight line – Second degree curve – Exponential curve-Power curve by method of least squares. Numerical Differentiation for Newton’s interpolation formula. Numerical Integration: Trapezoidal rule – Simpson’s 1/3 Rule – Simpson’s 3/8 Rule.</p>		
<b>UNIT – III</b>		8 Hrs
<p><b>Numerical solution of Ordinary Differential equations:</b> Solution by Taylor’s series-Picard’s Method of successive Approximations-Euler’s Method- Runge - Kutta Methods. Numerical solutions of Laplace equation using finite difference approximation. Initial Value Problem, Eigen Value Problem and Boundary-value Problem</p>		
<b>Textbooks:</b>		
<ol style="list-style-type: none"> <li>Using Information Technology 9th Edition By Brian Williams and Stacey Sawyer, Mcgraw Hill Publications</li> <li>“Computer Oriented Numerical Methods” by V Rajaraman</li> </ol>		
<b>Reference Books:</b>		
<ol style="list-style-type: none"> <li>Uttam K Roy, –Web TechnologiesI, Oxford University Press, 1st Edition, 2010.</li> <li>HTML and CSS: Design and Build Websites 1st Edition by Jon Duckett (Author) india price</li> <li>Steven Holzner, –The Complete Reference PHPI, Tata McGraw-Hill, 1st Edition, 2007.</li> <li>HTML &amp; CSS: The Complete Reference, Fifth Edition (Complete Reference Series)</li> <li>Deitel and Deitel and Nieto, –Internet and World Wide Web - How to ProgramI, Prentice Hall, 5 th Edition, 2011.</li> <li>Numerical Methods by E Balaguruswamy</li> </ol>		
<b>Online Learning Resources:</b>		
<ol style="list-style-type: none"> <li><a href="http://www.scoopworld.in">http://www.scoopworld.in</a></li> <li><a href="http://www.sxecw.edu.in">http://www.sxecw.edu.in</a></li> <li><a href="http://www.technofest2u.blogspot.com">http://www.technofest2u.blogspot.com</a></li> <li><a href="http://www.ptutorial.com/php-example/php-upload-image">http://www.ptutorial.com/php-example/php-upload-image</a></li> <li><a href="http://www.ptutorial.com/php-example/php-change-case">http://www.ptutorial.com/php-example/php-change-case</a></li> <li><a href="https://www.math.ust.hk/~machas/numerical-methods.pdf">https://www.math.ust.hk/~machas/numerical-methods.pdf</a></li> </ol>		

**Mapping of course outcomes with program outcomes**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>CO4</b>	3													
<b>CO5</b>	3													
<b>CO6</b>	3													

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

<b>Course Code</b>	<b>Computer Science And Engineering Workshop</b>		<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20AES0506			<b>0</b>	<b>0</b>	<b>3</b>	<b>1.5</b>
<b>Pre-requisite</b>	<b>Basic Computer Knowledge</b>	<b>Semester</b>	<b>I - I</b>			
<b>Course Outcomes (CO):</b>						
<p><b>CO1:</b> Assemble and disassembling parts of a computer  <b>CO2:</b> Develop Documents using Word processors  <b>CO3:</b> Develop presentations using the presentation tool  <b>CO4:</b> Perform computations using spreadsheet tool  <b>CO5:</b> Design Graphics, Videos and Web pages</p>						
<b>Preparing your computer</b>						
<p><b>Task 1: Assembling a Computer:</b> Disassemble and assemble the PC back to working condition. Students should be able to trouble shoot the computer and identify working and non-working parts. Student should identify the problem correctly by various methods available (eg: beeps). Students should record the process of assembling and trouble shooting a computer.</p>						
<p><b>Task 2: Install Operating system:</b> Student should install Linux on the computer. Student may install another operating system (including proprietary software) and make the system dual boot or multi boot. Students should record the entire installation process.</p>						
<b>Productivity tools</b>						
<p><b>Task 3: Word Processor:</b> Students should be able to create documents using the word processor tool. Some of the tasks that are to be performed are inserting and deleting the characters, words and lines, Alignment of the lines, Inserting header and Footer, changing the font, changing the colour, including images and tables in the word file, making page setup, copy and paste block of text, images, tables, linking the images which are present in other directory, formatting paragraphs, spell checking, etc. Students should be able to prepare project cover pages, content sheet and chapter pages at the end of the task using the features studied. Students should submit a user manual of the word processor considered.</p>						
<p><b>Task 4: Spreadsheet:</b> Students should be able to create, open, save the application documents and format them as per the requirement. Some of the tasks that may be practiced are Managing the worksheet environment, creating cell data, inserting and deleting cell data, format cells, adjust the cell size, applying formulas and functions, preparing charts, sorting cells. Students should submit a user manual of the Spreadsheet application considered.</p>						
<p><b>Task 5: Presentations:</b> creating, opening, saving and running the presentations, selecting the style for slides, formatting the slides with different fonts, colours, creating charts and tables, inserting and deleting text, graphics and animations, bulleting and numbering, hyperlinking, running the slide show, setting the timing for slide show. Students should submit a user manual of the Presentation tool considered.</p>						
<b>IoT</b>						
<p><b>Task 6: Raspberry Pi</b>  Study the architecture of Raspberry pi, configure software, Install SD card, Connect the cables, Install Raspbian (or any other) operating system, Configure Wi-Fi, Remotely connect to your Raspberry Pi.</p>						
<b>Story Telling</b>						
<p><b>Task 7: Storytelling</b>  Use Adobe spark or any other tool to create Graphics, Webpages, and Videos.</p>						
<b>Reference Books:</b>						
<ol style="list-style-type: none"> <li>1. B. Govindarajulu, "IBM PC and Clones Hardware Trouble shooting and Maintenance", 2nd edition, Tata McGraw-Hill, 2002</li> <li>2. "MOS study guide for word, Excel, Powerpoint &amp; Outlook Exams", Joan Lambert, Joyce Cox, PHI.</li> <li>3. "Introduction to Information Technology", ITL Education Solutions limited, Pearson Education.</li> <li>4. Rusen, "Networking your computers and devices", PHI</li> <li>5. Bigelows, "Trouble shooting, Maintaining &amp; Repairing PCs", TMH.</li> </ol>						
<b>Online Learning Resources:</b>						
<ol style="list-style-type: none"> <li>1. <a href="https://www.adobe.com">https://www.adobe.com</a></li> <li>2. <a href="https://www.raspberrypi.org">https://www.raspberrypi.org</a></li> </ol>						

#### Mapping of course outcomes with program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2							2			2	2	
CO2	3	2	2		2				1			2	2	2
CO3	3	2	2		2	2			1			2	2	2
CO4	3	2	2		2	2			1			2	2	
CO5	3	3	2			2			2			2	2	2

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

<b>Course Code</b>	<b>Chemistry Lab</b>		<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20ABS9909			<b>0</b>	<b>0</b>	<b>3</b>	<b>1.5</b>
<b>Pre-requisite</b>	<b>Basics of chemical formulas and equations</b>	<b>Semester</b>	<b>I - I</b>			
<b>Course Outcomes (CO):</b>						
<p><b>CO1:</b> To familiarize the students with the basic concepts of chemistry of materials</p> <p><b>CO2:</b> Prepare advanced polymer materials</p> <p><b>CO3:</b> Measure the strength of an acid present in secondary batteries</p> <p><b>CO4:</b> To familiarize with digital and instrumental methods of analysis</p>						
<b>List of Experiments:</b>						
<ol style="list-style-type: none"> <li>Determination of Hardness of a groundwater sample.</li> <li>Estimation of iron (II) using Diphenylamine indicator (Dichrometry – Internal indicator method)</li> <li>Determination of pH metric titration of strong acid vs. strong base,</li> <li>Conductometric titration of strong acid vs. strong base</li> <li>Determination of Fe(II) in Mohr's salt by potentiometric method.</li> <li>Determination of percentage of Iron in Cement sample by colorimetry</li> <li>Determination of Strength of an acid in Pb-Acid battery</li> <li>Preparation of phenol-formaldehyde resin</li> <li>Preparation of TiO<sub>2</sub>/ZnO nano particles</li> <li>Estimation of Calcium in port land Cement</li> <li>Adsorption of acetic acid by charcoal</li> <li>Thin layer chromatography</li> </ol>						

**Mapping of course outcomes with program outcomes**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>CO1</b>	<b>3</b>							<b>2</b>						
<b>CO2</b>	<b>3</b>		<b>1</b>					<b>2</b>						
<b>CO3</b>	<b>3</b>	<b>1</b>	<b>1</b>					<b>2</b>						
<b>CO4</b>	<b>3</b>		<b>2</b>					<b>2</b>						

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

Course Code	Problem Solving And Programming Lab		L	T	P	C
20AES0503			0	0	3	1.5
Pre-requisite	Basic Mathematics	Semester	I - I			
<b>Course Objectives:</b>						
The course is designed to provide complete knowledge of C language. Students will be able to develop logics which will help them to create programs, applications in C. Also by learning the basic programming constructs they can easily switch over to any other language in future.						
<b>Course Outcomes (CO):</b>						
<b>CO1:</b> Assemble and disassembling parts of a Computer <b>CO2:</b> Identify to control structure to solving the problem <b>CO3:</b> Analyze different sorting algorithms <b>CO4:</b> Design solutions for computational problems <b>CO5:</b> Develop C programs which utilize the memory efficiently using programming constructs like pointers.						
<b>Laboratory Experiments #</b>						
<ol style="list-style-type: none"> <li>Assemble and disassemble parts of a Computer</li> <li>Design a C program which reverses the number</li> <li>Design a C program which finds the second maximum number among the given list of numbers.</li> <li>Construct a program which finds the kth smallest number among the given list of numbers.</li> <li>Design an algorithm and implement using C language the following exchanges <math>a \leftarrow b \leftarrow c \leftarrow d \leftarrow a</math></li> <li>Develop a C Program which counts the number of positive and negative numbers separately and also compute the sum of them.</li> <li>Implement the C program which computes the sum of the first n terms of the series <math>\text{Sum} = 1 - 3 + 5 - 7 + 9</math></li> <li>Design a C program which determines the numbers whose factorial values are between 5000 and 32565.</li> <li>Design an algorithm and implement using a C program which finds the sum of the infinite series <math>1 - x^2/2! + x^4/4! - x^6/6! + \dots</math></li> <li>Design a C program to print the sequence of numbers in which each number is the sum of the three most recent predecessors. Assume first three numbers as 0, 1, and 1.</li> <li>Implement a C program which converts a hexadecimal, octal and binary number to decimal number and vice versa.</li> <li>Develop an algorithm which computes the all the factors between 1 and 100 for a given number and implement it using C.</li> <li>Construct an algorithm which computes the sum of the factorials of numbers between m and n.</li> <li>Design a C program which reverses the elements of the array.</li> <li>Given a list of n numbers, Design an algorithm which prints the number of stars equivalent to the value of the number. The stars for each number should be printed horizontally.</li> <li>Implement the sorting algorithms a. Insertion sort b. Exchange sort c. Selection sort d. Partitioning sort.</li> <li>Illustrate the use of auto, static, register and external variables.</li> <li>Design algorithm and implement the operations creation, insertion, deletion, traversing on a singly linked list.</li> <li>Develop a C program which takes two numbers as command line arguments and finds all the common factors of those two numbers.</li> <li>Design a C program which sorts the strings using array of pointers.</li> </ol>						
Instructors may add some experiments to the above list. Moreover, 50% of the experiments are to be changed every academic year. Instructors can choose the experiments, provided those experiments are not repetitions.						
<b>Textbooks:</b>						
<ol style="list-style-type: none"> <li>Pradip Dey, and Manas Ghosh, "Programming in C", 2018, Oxford University Press.</li> <li>R.G. Dromey, "How to Solve it by Computer". 2014, Pearson.</li> <li>Brian W. Kernighan, and Dennis M. Ritchie, "The C Programming Language", 2<sup>nd</sup> Edition, Pearson.</li> </ol>						
<b>Reference Books:</b>						
<ol style="list-style-type: none"> <li>B. Govindarajulu, "IBM PC and Clones Hardware Trouble shooting and Maintenance", Tata McGraw-Hill, 2<sup>nd</sup> edition, 2002.</li> <li>R.G. Dromey, "How to Solve it by Computer". 2014, Pearson.</li> </ol>						
<b>Online Learning Resources:</b>						
<a href="http://www.nptel.ac.in/cprogramming">www.nptel.ac.in/cprogramming</a>						

**Mapping of course outcomes with program outcomes**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	2	2							2				2	
C02	2	2	2										2	
C03	2	2											2	
C04	2	2	3	2									2	2
C05	2	2	3	3	2							3	2	2

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

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