

**DEPARTMENT OF**

**COMPUTER**

**SCIENCE AND**

**ENGINEERING**

## VISION OF THE DEPARTMENT

To achieve academic and research excellence in essential technologies of Computer Science and Engineering by promoting a creative environment for learning and innovation.

## MISSION OF THE DEPARTMENT

- To provide dynamic, innovative and flexible curriculum which equip the students with the necessary problem driven skills to strengthen their career prospects and potential to pursue higher studies.
- To foster inquisitive-driven research among students and staff so as to reinforce the domain knowledge and address contemporary societal issues.
- To inculcate ethical values, leadership qualities and professional behaviour skills for improving the living standards of people

**B.TECH.**  
**(COMPUTER SCIENCE AND ENGINEERING)**

# B.TECH. (CSE)

## PROGRAM EDUCATIONAL OBJECTIVES

**PEO-I:** The graduates of the program will become proficient in the principles and practices of computer science, mathematics and science, enabling them to solve a wide range of computing related problems.

**PEO-II:** To enable the students with innovative applications of engineering knowledge and programming skills to spearhead the progress of society in the information age.

**PEO-III:** To mould the students into competent, successful, and practicing engineers in their career and/or in pursuing their higher studies through the spirit of innovation and entrepreneurship.

**PEO-IV:** To provide exposure to cutting edge technologies, adequate training and opportunities to work individually and as teams on multidisciplinary projects with effective analytical skills.

**PEO-V:** To acquire and practice the profession with ethics, integrity and leadership qualities with due consideration to environmental issues in conformance with societal needs.

# B.TECH. (CSE)

## PROGRAM OUTCOMES

**PO-1: Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**PO-2: Problem Analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**PO-3: Design/Development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO-4: Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO-5: Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**PO-6: The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

**PO-7: Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO-8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities, and norms of the engineering practice

**PO-9: Individual and Teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO-10: Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO-11: Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO-12: Life-Long Learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning (LLL) in the broadest context of technological change.

# B.TECH. (CSE)

## PROGRAM SPECIFIC OUTCOMES

**PSO-1:** Apply the Knowledge of Programming Languages, Networks and Databases for development of Software Applications.

**PSO-2:** Identify, Analyse, Formulate and Solve Real Time Complex Engineering Problems.

**PSO-3:** Design, Implement and Deploy a Quality Based Software System to meet the Evolving needs.



**VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY HYDERABAD**  
**B.TECH. I YEAR**  
**COMPUTER SCIENCE AND ENGINEERING**

**I SEMESTER**

**R22**

Course Code	Title of the Course	L	T	P/D	CH	C
22BS1MT101	Matrices and Calculus	3	1	0	4	4
22BS1CH102	Chemistry for Engineers	3	0	0	3	3
22ES1EE101	Basic Electrical and Electronics Engineering	3	0	0	3	3
22ES1CS101	Programming for Problem Solving	3	0	0	3	3
22ES3ME102	Engineering Drawing	0	0	4	4	2
22BS2CH101	Engineering Chemistry Laboratory	0	0	2	2	1
22ES2CS101	Programming for Problem Solving Laboratory	0	0	2	2	1
22ES2EE101	Basic Electrical and Electronics Engineering Laboratory	0	0	2	2	1
22ES2CS104	Data Analysis with Excel	0	0	2	2	1
22SD5CS101	Elements of Computer Science and Engineering	0	0	2	2	1
22MN6HS101	Induction Programme	2	0	0	2	0
<b>Total</b>		<b>14</b>	<b>1</b>	<b>14</b>	<b>29</b>	<b>20</b>

**II SEMESTER**

**R22**

Course Code	Title of the Course	L	T	P/D	CH	C
22BS1MT102	Ordinary Differential Equations and Vector Calculus	2	1	0	3	3
22BS1MT103	Statistical Methods for Data Analysis	3	0	0	3	3
22HS1EN101	English for Skill Enhancement	2	0	0	2	2
22ES1CS102	Data Structures	3	0	0	3	3
22BS1PH102	Applied Physics	3	0	0	3	3
22BS2PH102	Applied Physics Laboratory	0	0	2	2	1
22HS2EN101	English Language and Communication Skills Laboratory	0	0	2	2	1
22ES2CS102	Data Structures Laboratory	0	0	2	2	1
22ES2DS101	Python Programming	0	0	2	2	1
22ES2ME102	Engineering and IT Workshop	1	0	2	3	2
22MN6HS103	Happiness and Wellness	2	0	0	2	0
<b>Total</b>		<b>16</b>	<b>1</b>	<b>10</b>	<b>27</b>	<b>20</b>

L – Lecture      T – Tutorial      P – Practical      D – Drawing      CH – Contact Hours/Week  
C – Credits      SE – Sessional Examination      CA – Class Assessment      ELA – Experiential Learning Assessment  
SEE – Semester End Examination      D-D – Day to Day Evaluation      LR – Lab Record  
CP – Course Project      PE – Practical Examination

## VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

### B.Tech. I Semester

#### (22BS1MT101) MATRICES AND CALCULUS

TEACHING SCHEME		
L	T/P	C
3	1	4

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

**COURSE PRE-REQUISITES:** Matrices, Differentiation, Integration

#### COURSE OBJECTIVES:

- To know the rank of the matrix and its application to consistency of system of linear equations
- To know Eigen values and Eigen vectors
- To know the nature of Quadratic forms
- To know maximum and minimum of a given function with several variables
- To evaluate multiple integrals and their applications

**COURSE OUTCOMES:** After completion of the course, the student should be able to

**CO-1:** Compute the rank of a matrix and analyze the solution of a system of linear equations

**CO-2:** Calculate Eigen values and Eigen vectors

**CO-3:** Reduce the quadratic form to its canonical form

**CO-4:** Solve problems involving Maxima and Minima

**CO-5:** Evaluate multiple integrals and its applications in areas and volumes

#### COURSE ARTICULATION MATRIX:

*(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)*

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	1	-	-	1	1	-	2	1	-	2	-	-
CO-2	3	2	2	1	-	1	1	-	2	1	-	2	-	-
CO-3	3	2	2	-	-	1	1	-	2	1	-	2	-	-
CO-4	3	2	1	1	-	1	1	-	2	1	-	2	-	-
CO-5	3	2	1	-	-	1	1	1	2	1	-	2	-	-

#### UNIT-I:

**Matrices:** Types of real matrices, symmetric, skew symmetric and orthogonal matrices; Rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method; System of linear equations; Consistency of Homogeneous and Non-Homogeneous equations, LU Decomposition method.

#### UNIT-II:

**Eigen Values and Eigen Vectors:** Eigen values and eigenvectors and their properties, Diagonalization of matrices; Cayley-Hamilton Theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton Theorem

### **UNIT-III:**

**Complex Matrices and Quadratic Forms:** Types of complex matrices; Hermitian; Skew-Hermitian, Unitary Matrices and its properties; Quadratic forms and Nature of the Quadratic Forms, Reduction of Quadratic form to canonical form using Linear Transformation and Orthogonal Transformation.

### **UNIT-IV:**

**Functions of Several Variables:** Definitions of Limits, Continuity. Partial differentiation: partial derivatives of first and second order, Euler's theorem, Total derivative, Jacobian, Functional dependence, Taylor's theorem of two variables (without proof). Maxima and Minima of two variables, Lagrange's method of undetermined Multipliers.

### **UNIT-V:**

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

### **TEXT BOOKS:**

1. Higher Engineering Mathematics, B. V. Ramana, Tata McGraw Hill, New Delhi, 11<sup>th</sup> Reprint, 2010
2. Advanced Engineering Mathematics, R. K. Jain and S. R. K. Iyengar, Narosa Publications
3. Advanced Engineering Mathematics, Erwin Kreyszig, 9<sup>th</sup> Edition, John Wiley India Pvt. Ltd.

### **REFERENCES:**

1. Linear Algebra and its Applications, Gilbert Strang, Cengage Publication
2. Matrices, A. R. Vasishtha and A. K. Vasishtha, Krishna's Educational Publishers
3. Engineering Mathematics, N. P. Bali, 4<sup>th</sup> Edition, Laxmi Publications (P) Ltd.
4. Calculus and Analytic Geometry, G. B. Thomas and R. L. Finney, 9<sup>th</sup> Edition, Pearson, 2002
5. Linear Algebra and its Applications, David C. Lay, Pearson Education India, 2003

# VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

## B.Tech. I Semester

### (22BS1CH102) CHEMISTRY FOR ENGINEERS

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

**COURSE PRE-REQUISITES:** General Chemistry and Basic Mathematics

#### COURSE OBJECTIVES:

- To analyze the quality of water for sustainable living
- To acquire the knowledge about polymer science and its applications in various fields
- To outline the importance of non-conventional energy sources and portable electric devices
- To imbibe the conceptual knowledge of corrosion science
- To recognize the significance of engineering materials for multidisciplinary environs

**COURSE OUTCOMES:** After completion of the course, the student should be able to

**CO-1:** Assess the specification of water regarding its usage in domestic & Industrial scenarios

**CO-2:** Analyze the efficacy of polymers in diverse applications

**CO-3:** Recognize the transformations in energy sources & battery technology

**CO-4:** Predict the suitable corrosion control methods in safeguarding the structures

**CO-5:** Interpret the role of engineering materials in various sectors

#### COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	1	-	-	1	1	-	2	1	-	2	-	-
CO-2	3	2	2	1	-	1	1	-	2	1	-	2	-	-
CO-3	3	2	2	-	-	1	1	-	2	1	-	2	-	-
CO-4	3	2	1	1	-	1	1	-	2	1	-	2	-	-
CO-5	3	2	1	-	-	1	1	1	2	1	-	2	-	-

#### UNIT - I:

**Water and its Treatment:** Introduction- Hardness - causes, expression of hardness, units of hardness, types of hardness, Numerical problems (temporary & permanent hardness of water). Estimation of hardness by EDTA method.

Potable water and its specifications. Steps involved in the treatment of potable water – screening, sedimentation, coagulation, filtration, and disinfection methods- boiling, chlorination (By Chlorine gas, Bleaching powder, Chloramine), Breakpoint of chlorination.

Boiler troubles - boiler corrosion, caustic embrittlement, scale & sludge formation. Internal treatment- Calgon, phosphate, and colloidal conditioning, External treatment - Softening of water by ion- exchange processes. Desalination of brackish water – Reverse osmosis and its advantages.

## UNIT – II:

**Polymer Science:** Definition – Classification of polymers with examples, Types of polymerizations, addition, and condensation polymerization with examples. Properties of polymers-crystallinity & glass transition temperature.

**Plastics:** Definition and characteristics-thermoplastic and thermosetting plastics, Preparation, Properties, and applications of Teflon, PMMA, PC, PET, Bakelite.

Moulding of Plastics (Compression, Extrusion, Blow moulding and Thermoforming).

Fiber reinforced plastics (FRP)-features & applications.

**Conducting Polymers:** Classification and applications of conducting polymers.

**Shape Memory Polymers (SMPs):** Definition, classification based on their mode of activation (thermo-responsive, light-responsive, electrically, magnetically Induced and water activated -brief note) and applications of SMPs in various fields.

## UNIT – III:

**Energy Sources & Battery Technology:** Definition and characteristics of fuel, Types of fuels, analysis of coal – proximate and ultimate analysis. Petroleum and its Refining Cracking- Definition, types -moving bed catalytic cracking process. Knocking – octane and cetane rating, Gaseous fuels –Types of hydrogen fuel, generation of green hydrogen-mechanism of electrolysis of water.

**Battery Technology:** Definition, Characteristics of a good battery, Classification of batteries- primary, secondary, reserve and fuel cells with examples.

**Primary Batteries:** Zn-air battery-Construction and working.

Rechargeable batteries: Construction and working of lithium-ion battery and its importance in electric vehicles.

**Fuel Cell:** Definition, construction, working, principle, and applications of methanol-oxygen fuel cell.

## UNIT – IV:

**Corrosion and its Control:** Introduction causes and effects of corrosion, mechanism of chemical and electrochemical corrosion. Types-differential aeration corrosion (Pitting and waterline corrosion), differential metal corrosion (Galvanic corrosion).

Factors affecting corrosion-nature of metal (position, passivity, purity, areas of anode and cathode) & nature of environment (temperature, pH, humidity).

Corrosion control methods - cathodic protection-Sacrificial anodic and impressed current cathodic protection, comparison of galvanizing and tinning.

## UNIT – V:

### Engineering Materials:

**Nanomaterials:** Definition, Synthesis of nanomaterials- Top-down and bottom-up approaches. Characterization techniques of Nanomaterials – STM and AFM working principle, advantages, and limitations.

**Self-Healing Materials:** Features, principle, and applications.

**Biosensors:** Definition, characteristics, classification-, construction & working, applications and advantages of biosensors. Biochips -Definition, advantages, and applications.

**Lubricants:** Definition and need for lubricants, types- liquid, semi-solid, solid, mechanisms of lubrication-thick film lubrication, thin film lubrication and extreme pressure lubrication. Properties of lubricants-viscosity, cloud and pour point, flash and fire point, their definition and significance.

## TEXTBOOKS:

1. Engineering Chemistry, P. C. Jain and M. Jain, Dhanpat Rai Publishing Company, 2010

2. Engineering Chemistry, Rama Devi, Venkata Ramana Reddy and Rath, Cengage Learning, 2016

**REFERENCES:**

1. Engineering Chemistry, Shikha Agarwal, Cambridge University Press, 2015
2. Engineering Chemistry, Shashi Chawla, Dhanpat Rai, 2011
3. A Textbook of Engineering Chemistry, M. Thirumala Chary, E. Laxminarayana and K. Shashikala, Pearson Publications, 2021
4. Textbook of Engineering Chemistry, Jaya Shree Anireddy, Wiley Publications

## VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

### B.Tech. I Semester

### (22ES1EE101) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

#### COURSE OBJECTIVES:

- To understand the use of Electrical Energy in different engineering fields
- To analyze electrical circuits using different network reduction techniques
- To know the working & construction of electrical machines, electronic devices and components
- To identify different LT electrical installation components and know the safety measures

**COURSE OUTCOMES:** After completion of the course, the student should be able to

**CO-1:** Appreciate the role of Electrical Energy in various engineering branches and analyze the DC circuits using various network reduction techniques

**CO-2:** Analyze the various electrical parameters of AC circuits with R-L-C elements

**CO-3:** Understand the operation of various Electrical Machines

**CO-4:** Know about Low Voltage Electrical Installation components and the safety measures

**CO-5:** Get familiarized with different electronic components and to find their suitability in the relevant fields of engineering

#### COURSE ARTICULATION MATRIX:

*(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)*

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	2	3	3	3	2	1	1	1	1	1	1	1	-	-	-	-
CO-2	2	3	3	3	2	1	1	1	1	1	1	1	-	-	-	-
CO-3	3	2	3	2	1	1	1	1	1	1	1	1	-	-	-	-
CO-4	1	1	1	1	1	3	3	1	1	1	1	1	-	-	-	-
CO-5	3	2	3	2	1	1	1	1	1	1	1	1	-	-	-	-

#### UNIT - I:

**Introduction to Electrical Energy and DC Circuits:** The role of Electrical Energy in modern life and various engineering branches- Circuit Concept – Types of Elements- R-L-C parameters – Voltage and Current sources – Independent and dependent sources- Kirchhoff's laws – network reduction techniques: series, parallel, series parallel, star/delta transformations, Superposition theorem, Thevenin's theorem.

#### UNIT - II:

**Steady State AC Circuits:** Representation of sinusoidal waveforms, average and RMS values, form factor and peak factor, phasor representation, Analysis of single-phase

AC circuits consisting of R, L, C, series RL, RC, RLC combinations, real power, reactive power, apparent power, power factor - Three-phase balanced circuits, voltage and current relations in star and delta connections (Derivation only).

#### **UNIT-III:**

**Transformers and DC Machines:** Transformer principle, Ideal and Practical Transformers, Equivalent circuit, Regulation and Efficiency, Basic Construction of DC machine, DC generator principle, Emf equation, DC motor principle, back Emf, Load characteristics and speed control of separately excited DC motor.

#### **UNIT-IV:**

**Alternating Current Machines:** Three phase induction motor, types, principle, torque Slip characteristics, Working principle of Synchronous generator.

**Electrical Installations and Batteries:** Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, MCCB, Types of Wiring, Earthing: Need of earthing, Types (Pipe and Plate earthing), classification of batteries, working and electrical characteristics of Lead Acid battery.

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

**Semi-Conductor Devices and Data Acquisition:** P-N junction diode, symbol, V-I Characteristics, Diode Applications: Half wave, Full wave rectifiers. Bipolar Junction Transistor construction (NPN and PNP transistors), Common-Emitter configuration, Transistor as an amplifier. A/D and D/A converters, Data Acquisition and Control.

#### **TEXT BOOKS:**

1. Basic Electrical Engineering, D. C. Kulshreshtha, 2<sup>nd</sup> Edition, TMH, Revised 2019
2. Basic Electrical Engineering, P. Ramana, M. Suryakalavathi, G. T. Chandra Sekhar, 1<sup>st</sup> Edition, S. Chand Technical Publications, 2018
3. Electronic Devices and Circuits, S. Salivahanan and N. Suresh Kumar, 3<sup>rd</sup> Edition TMH, 2019

#### **REFERENCES:**

1. Electrical and Electronics Technology, E. Hughes, 10<sup>th</sup> Edition, Pearson, 2010
2. Electrical Engineering Fundamentals, Vincent Deltoro, 2<sup>nd</sup> Edition, Prentice Hall India, 1989
3. Electrical and Electronics Measurements and Instrumentation, A. K. Sawhney, 3<sup>rd</sup> Edition, Dhanpat Rai & Co 1983
4. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, 3<sup>rd</sup> Edition, Tata McGraw Hill, 2010
5. Engineering Circuit Analysis, William Hayt and Jack E. Kemmerly, 8<sup>th</sup> Edition, McGraw Hill, 2013

#### **ONLINE RESOURCES:**

<https://nptel.ac.in/courses/108108076>



## VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

### B.Tech. I Semester

### (22ES1CS101) PROGRAMMING FOR PROBLEM SOLVING

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

#### COURSE OBJECTIVES:

- To relate basics of programming language constructs and problem-solving techniques
- To classify and implement control structures and derived data types
- To analyze and develop effective modular programming
- To construct mathematical problems and real time applications using C Language

**COURSE OUTCOMES:** After completion of the course, the student should be able to

**CO-1:** Illustrate the flowchart, algorithm, pseudo code for a given problem

**CO-2:** Execute programs using various data types and operators

**CO-3:** Implement programs using conditional and iterative statements for a given problem

**CO-4:** Exercise on programs using arrays, pointers, dynamic memory management, structures and unions

**CO-5:** Develop solution for a given problem using modular approach and perform file handling

#### COURSE ARTICULATION MATRIX:

*(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)*

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2	2	3	1	-	-	-	-	2	2	1	-	-	-
CO-2	2	2	3	2	1	-	-	-	2	2	-	2	-	-
CO-3	2	2	3	2	1	1	-	-	2	2	-	2	-	-
CO-4	1	2	3	1	1	1	-	-	2	2	2	2	-	-
CO-5	1	2	3	1	1	1	-	-	2	2	2	2	-	-

#### UNIT - I:

##### Introduction to Programming:

Compilers, compiling and executing a program.

Representation of Algorithm, Flowchart/ Pseudocode with examples, Program design and structure of C programming.

Variables, Data types Operators, expressions and precedence, Expression evaluation, Storage classes, type conversion.

**I/O:** Simple input and output with scanf and printf, formatted I/O, Introduction to stdin, stdout and stderr.

**Conditional Branching:** Branching with if, if-else, nested if-else, else-if ladder, switch-case, goto,

## **UNIT - II:**

### **Loops, Arrays, Strings:**

**Loops:** Iteration with for, while, do- while loops, break and continue statements.

**Arrays:** One and two dimensional arrays, creating, accessing and manipulating elements of arrays

**Strings:** Introduction to strings, handling strings as array of characters, string functions available in C arrays of strings.

## **UNIT – III:**

### **Searching, Sorting, Functions:**

**Searching:** Basic searching in an array of elements (linear and binary search techniques)

**Sorting:** Basic algorithms to sort array of elements (Bubble, Insertion and Selection sort algorithms), Basic concept of order of complexity through the example programs

**Functions:** Designing structured programs, Declaring a function, Signature of a function, Parameters and return type of a function, passing parameters to functions, call by value. Recursion with examples. Some C standard functions and libraries.

## **UNIT-IV:**

### **Structures and Pointers:**

**Structures:** Defining structures, initializing structures, unions, Array of structures,

**Pointers:** Idea of pointers, Defining pointers, Pointers to Arrays and Structures, Passing arrays to functions and structures to functions. Dynamic memory allocation, self-referential structures

## **UNIT - V:**

### **Preprocessor Directives and File Handling in C:**

**Preprocessor Directives:** Symbolic constants, macro expansion and file inclusion.

**User Defined Data Types:** enum, typedef

**Files:** Text and Binary files, file input/output operations, Error Handling in Files, random access of files, command line arguments.

## **TEXT BOOKS:**

1. The C Programming Language , Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall of India
2. C Programming and Data Structures, B. A. Forouzan and R. F. Gilberg, 3<sup>rd</sup> Edition,
3. Cengage Learning
4. C: The Complete Reference, Herbert Schildt, Mc Graw Hill, 4<sup>th</sup> Edition

## **REFERENCES:**

1. Problem Solving and Program Design in C, Jeri R. Hanly and Elliot B. Koffman, 7<sup>th</sup> Edition, Pearson
2. Computer Fundamentals and C, E. Balagurusamy, 2<sup>nd</sup> Edition, McGraw-Hill
3. Let us C, Yashavant Kanetkar, 18<sup>th</sup> Edition, BPB
4. How to Solve it by Computer, R. G. Dromey, 16<sup>th</sup> Impression, Pearson
5. Programming in C, Stephen G. Kochan, 4<sup>th</sup> Edition, Pearson Education

## **ONLINE RESOURCES:**

1. <https://nptel.ac.in/courses/106105171>
2. [https://ugcmoocs.inflibnet.ac.in/index.php/courses/view\\_ug/307](https://ugcmoocs.inflibnet.ac.in/index.php/courses/view_ug/307)

# VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

## B.Tech. I Semester

### (22ES3ME102) ENGINEERING DRAWING

TEACHING SCHEME		
L	T/P	C
0	4	2

EVALUATION SCHEME				
D-D	SE	CP	SEE	TOTAL
10	20	10	60	100

#### COURSE OBJECTIVES:

- To understand the importance of engineering curves
- To learn to use the orthographic projections for points, lines and planes
- To Understand the Projections of Solids in different positions
- To learn the importance of Isometric Projections and its conversions

**COURSE OUTCOMES:** After completion of the course, the student should be able to

**CO-1:** Apply the concepts of engineering curves and its construction using AutoCAD

**CO-2:** Solve the problems of projections of points, lines and planes in different positions using AutoCAD

**CO-3:** Solve the problems of Projections of Solids using AutoCAD

**CO-4:** Solve the problems on Conversion of Isometric views to Orthographic Views & Orthographic to Isometric Views using AutoCAD

#### COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	2	1	3	-	-	-	3	2	2	-	-	-
CO-2	3	2	2	1	3	-	-	-	3	2	2	-	-	-
CO-3	3	2	2	1	3	-	-	-	3	2	2	-	-	-
CO-4	3	2	2	1	3	-	-	-	3	2	2	-	-	-

#### Introduction to AutoCAD Software:

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

#### UNIT-I:

**Introduction to Engineering Drawing:** Principles of Engineering drawing and their significance and Conventions

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

#### UNIT-II:

**Orthographic Projections, Projections of Points & Straight Lines:** Principles of Orthographic Projections – Conventions; Projections of Points in all positions; Projections of lines inclined to both the planes

**UNIT-III:**

**Projections of Planes:** Projections of Planes- Surface Inclined to both the Planes

**UNIT-IV:**

**Projections of Regular Solids:** Projections of Regular Solids inclined to both the Planes – Prisms, Pyramids, Cylinder and Cone

**UNIT-V:**

**Isometric Projections:** Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and Compound Solids Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions

**TEXT BOOKS:**

1. Engineering Drawing, N. D. Bhatt, 53<sup>rd</sup> Edition, Charotar Publishing House, 2016
2. Textbook on Engineering Drawing, K. L. Narayana & P. Kanniah, Scitech Publishers, 2010
3. Engineering Drawing and Computer Graphics, M. B. Shah & B. C. Rana, Pearson Education, 2010

**REFERENCES:**

1. Mastering AutoCAD 2021 and AutoCAD LT 2021, George Omura and Brian C Benton (AutoCAD 2021), 1<sup>st</sup> Edition, John Wiley & Sons

**ONLINE RESOURCES:**

1. <https://www.classcentral.com/course/swayam-engineering-graphics-5305>
2. <https://www.mooc-list.com/tags/engineering-drawing>

# VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

## B.Tech. I Semester

### (22BS2CH101) ENGINEERING CHEMISTRY LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

**COURSE PRE-REQUISITES:** Basic Knowledge of Volumetric Analysis and Mathematics

#### COURSE OBJECTIVES:

- To understand the preparation of standard solutions and handling of instruments
- To determine and evaluate the water quality
- To measure physical properties like absorption of light, surface tension, pH, conductance and viscosity of various liquids
- To conduct and collect the experimental data using different laboratory techniques
- To summarize the data and find the applicability to real world scenario

**COURSE OUTCOMES:** After completion of the course, the student should be able to

**CO-1:** Learn and apply the basic laboratory methodologies for the preparation of the standard solutions and handling of instruments

**CO-2:** Estimate the ions / metal ions present in domestic and industrial water

**CO-3:** Utilize the instrumental techniques to assess the physical properties of oils and water

**CO-4:** Analyze the experimental data to predict solutions for complex engineering problems

**CO-5:** Apply the skills gained to solve societal issues related to real world scenario

#### COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	3	2	1	-	-	1	1	-	2	1	-	2	-	-
CO-2	3	2	2	1	-	1	1	-	2	1	-	2	-	-
CO-3	3	2	2	-	-	1	1	-	2	1	-	2	-	-
CO-4	3	2	1	1	-	1	1	-	2	1	-	2	-	-
CO-5	3	2	1	-	-	1	1	1	2	1	-	2	-	-

#### LIST OF EXPERIMENTS:

1. Estimation of hardness of water by complexometric method using EDTA.
2. Determination of chloride content in the given sample water using Argentometric method.
3. Estimation of copper present in the given solution by colorimetric method.
4. Conductometric titration of Acid vs Base.
5. Titration of Acid vs Base using pH metric method.
6. Conductometric titration of mixture of strong acid and weak acid by strong base
7. Determination of viscosity of sample oil by Redwood Viscometer-I.

8. Estimation of acid value of given lubricant oil.
9. Determination of surface tension of a liquid by drop method using Stalagmometer.
10. Synthesis of a Polymer-Bakelite/Nylon.

**VIRTUAL LAB EXPERIMENTS:**

11. Basic operations of Transmission Electron Microscope (Imaging and Diffraction Pattern)
12. Polymer processing technology- study construction and working of compression moulding.
13. Basics of Scanning Electron Microscopy: Secondary Electron and BSE imaging mode.
14. Batteries for electrical vehicles

**TEXT BOOKS:**

1. Laboratory Manual on Engineering Chemistry, S. K. Bhasin and Sudha Rani, Dhanpat Rai Publications
2. College Practical Chemistry V. K. Ahluwalia, Sunitha Dhingra, Adargh Gulati, University Press Pvt. Ltd.
3. Practical Chemistry, Dr. O. P. Pandey, D. N. Bajpai, and Dr. S. Giri, S. Chand Publications

**REFERENCES:**

1. Vogel's Text book of Quantitative Chemical Analysis, G.N. Jeffery, J. Bassett, J. Mendham and R. C. Denny, Longmann, ELBS
2. Advanced Practical Physical Chemistry, J. D. Yadav, Goel Publishing House
3. Practical Physical Chemistry, B. D. Khosla, R. Chand and Sons

**ONLINE RESOURCES:** (Virtual labs)

1. <https://emb-iitk.vlabs.ac.in/exp/transmission-electron-microscope>
2. [http://vlabs.iitb.ac.in/vlabs-dev/labs/mit\\_bootcamp/polymer\\_process/experimentlist.html](http://vlabs.iitb.ac.in/vlabs-dev/labs/mit_bootcamp/polymer_process/experimentlist.html)
3. <https://emb-iitk.vlabs.ac.in/exp/sem-basics/>

## VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

### B.Tech. I Semester

#### (22ES2CS101) PROGRAMMING FOR PROBLEM SOLVING LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

#### COURSE OBJECTIVES:

- To gain a working knowledge of C programming to write modular, efficient and readable C programs by Identifying the structural elements and layout of C source code
- To declare and manipulate single and multi-dimensional arrays of the C data types and derived data types like structures, unions
- To use functions from the portable C library and to describe the techniques for creating program modules using functions and recursive functions
- To manipulate character strings in C programs. Utilize pointers to efficiently solve problems

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

**CO-1:** Use various data types for a specified problem

**CO-2:** Design, implement, debug a given problem using appropriate language constructs

**CO-3:** Execute the programs using derived and user defined data types

**CO-4:** Implement programs using modular approach and file I/O

**CO-5:** Solve a given problem using C language

#### COURSE ARTICULATION MATRIX:

*(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)*

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO-1	2	2	3	2	1	-	-	-	2	2	-	2	-	-
CO-2	2	2	3	2	1	1	-	-	2	2	-	2	-	-
CO-3	1	2	3	1	1	1	-	-	2	2	2	2	-	-
CO-4	1	2	3	1	1	1	-	-	2	2	2	2	-	-
CO-5	2	2	2	2	1	1	-	-	2	2	2	2	-	-

#### LIST OF PROGRAMS:

##### WEEK 1:

- Programs on input, output statements
- Programs on various operators
- Programs on expression evaluation

##### WEEK 2:

- Program that converts one given data type to another using auto conversion and casting. Take the values from standard input.

- b. Programs on conditional statements- Simple if, if-else, Nested if-else, Else-if ladder, switch case

**WEEK 3:**

- a. Programs on simple loops- while, for, do. while
- b. Programs on Nested loops- while, for, do. while
- c. Programs to understand goto, break, continue

**WEEK 4:**

- a. Programs on 1-D arrays
- b. Programs on linear, binary searching
- c. Programs on bubble, selection and insertion sorting

**WEEK 5:**

- a. Programs on 1-D strings
- b. Programs using string handling functions

**WEEK 6:**

- a. Programs on 2-D arrays
- b. Programs on 2-D strings

**WEEK 7:**

- a. Programs on user defined functions
- b. Programs on passing arrays and strings to functions

**WEEK 8:** Internal Lab Exam -1

**WEEK 9:**

- a. Programs on recursion
- b. Programs on structures – simple structure, array of structures, array within structure, nested structure
- c. Programs on Unions

**WEEK 10:**

Programs on pointers to variables

- a. Programs on pointers to arrays(1-D, 2-D)

**WEEK 11:**

- a. Program to understand call by value and call by address
- b. Programs on pointers to strings
- c. Programs on pointers to structure
- d. Programs using malloc, calloc , realloc, free

**WEEK 12:**

- a. Programs on macros, file inclusion, enum , typedef
- b. Programs on sequential file accessing

**WEEK 13:**

- a. Programs on error handling functions in files
- b. Programs on Random file accessing
- c. Programs on command line arguments



## **WEEK 14:** Lab Internal Exam -2

### **TEXT BOOKS:**

1. The C Programming Language, Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall of India
2. C Programming and Data Structures, B. A. Forouzan and R. F. Gilberg, 3<sup>rd</sup> Edition, Cengage Learning
3. C: The Complete Reference, Herbert Schildt, 4<sup>th</sup> Edition, McGraw Hill

### **REFERENCES:**

1. Problem Solving and Program Design in C, Jeri R. Hanly and Elliot B. Koffman, 7<sup>th</sup> Edition, Pearson
2. Computer Fundamentals and C, E. Balagurusamy, 2<sup>nd</sup> Edition, McGraw-Hill
3. Let us C, Yashavant Kanetkar, 18<sup>th</sup> Edition, BPB
4. How to Solve it by Computer, R. G. Dromey, Pearson, 16<sup>th</sup> Impression
5. Programming in C, Stephen G. Kochan, 4<sup>th</sup> Edition, Pearson Education

### **ONLINE RESOURCES:**

1. <https://nptel.ac.in/courses/106105171>
2. [https://ugcmoocs.inflibnet.ac.in/index.php/courses/view\\_ug/307](https://ugcmoocs.inflibnet.ac.in/index.php/courses/view_ug/307)

## VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

### B.Tech. I Semester

#### (22ES2EE101) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

**COURSE PRE-REQUISITES:** Basic Electrical and Electronics Engineering

#### COURSE OBJECTIVES:

- To understand the construction of electrical equipment and operation of electronic devices
- To recognize different circuit reduction techniques
- To practice the techniques to control and assess electrical machines
- To know different electric safety measures

**COURSE OUTCOMES:** After completion of the course, the student should be able to

**CO-1:** Identify different parts of electrical equipment and appreciate their purpose

**CO-2:** Apply different network reduction techniques to solve and analyze electrical circuits

**CO-3:** Realize the compatibility of electrical machines in different engineering fields

**CO-4:** Control different electrical machines and evaluate their performance

**CO-5:** Appreciate the operation of various electronic devices

#### COURSE ARTICULATION MATRIX:

*(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)*

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
CO-1	2	3	3	3	2	1	1	1	1	1	1	1	-	-	-
CO-2	2	3	3	3	2	1	1	1	1	1	1	1	-	-	-
CO-3	3	2	3	2	1	1	1	1	1	1	1	1	-	-	-
CO-4	1	1	1	1	1	3	3	1	1	1	1	1	-	-	-
CO-5	3	2	3	2	1	1	1	1	1	1	1	1	-	-	-

#### LIST OF EXPERIMENTS:

1. Demonstration of safety precautions, measuring instruments, electrical and electronic components
2. Demonstration of LT switchgear components
3. Verification of KVL & KCL
4. Verification of superposition theorem
5. Verification of thevenin's theorem
6. Analysis of series RL, RC and RLC circuits
7. Load test on 1-  $\phi$  transformer
8. Speed Control of DC Shunt motor
9. Brake test on 3-  $\phi$  induction motor
10. Control of synchronous generator voltage through its field excitation
11. P-N junction diode characteristics

## 12. Transistor CE characteristics (Input and Output)

### **TEXT BOOKS:**

1. Basic Electrical Engineering, D. C. Kulshreshtha, 2<sup>nd</sup> Edition, TMH, 2019
2. Basic Electrical Engineering, P. Ramana, M. Suryakalavathi, G. T. Chandra Sekhar, 1<sup>st</sup> Edition, S. Chand Technical Publications, 2018
3. Electronic Devices and Circuits, S. Salivahanan and N. Suresh Kumar, 3<sup>rd</sup> Edition TMH, 2019

### **REFERENCES:**

1. Electrical and Electronics Technology, E. Hughes, 10<sup>th</sup> Edition, Pearson, 2010
2. Electrical Engineering Fundamentals, Vincent Deltoro, 2<sup>nd</sup> Edition, Prentice Hall India, 1989
3. Electrical and Electronics Measurements and Instrumentation, A. K. Sawhney, 3<sup>rd</sup> Edition, Dhanpat Rai & Co., 1983
4. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, 3<sup>rd</sup> Edition, Tata McGraw Hill, 2010
5. Engineering Circuit Analysis, William Hayt and Jack E. Kemmerly, 8<sup>th</sup> Edition, McGraw Hill, 2013

# VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

## B.Tech. I Semester

### (22ES2CS104) DATA ANALYSIS USING EXCEL

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

#### COURSE OBJECTIVES:

- To install Microsoft Office 2002 or 2003 or 2007
- To edit worksheets and worksheet features
- To customize Excel worksheets and workbooks
- To handle pivot tables and pivot table charts
- To create 2D and 3D graphs

**COURSE OUTCOMES:** After completion of the course, the student should be able to

**CO-1:** Import and export data from the Internet and merge the data into Excel

**CO-2:** Use functions for SUM, AVERAGE, MIN, and MAX, IF

**CO-3:** Summarize data in worksheets and workbooks

**CO-4:** Develop the skill to analyze data using pivot tables

**CO-5:** Explore named ranges and create charts

#### COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3	3	2	3	3	2	-	1	2	2	2	3	3	3	3	-
CO-2	3	3	3	2	2	3	-	1	2	2	2	3	3	3	3	-
CO-3	3	2	3	2	3	2	-	1	3	2	2	3	3	3	3	-
CO-4	3	3	2	2	3	2	-	1	3	2	2	3	3	2	2	-
CO-5	3	3	2	2	3	3	-	2	3	2	3	3	3	2	3	-

#### LIST OF EXERCISES:

##### EXERCISE 1: Getting to Know Excel & Entering Data

- Excel Orientation and Spreadsheet Basics
- Excel Data Types
- Entering Data
- Spreadsheet Setup

##### EXERCISE 2: Navigate in Worksheets and Workbooks

- Search for data within a workbook
- Navigate to a named cell, range, or workbook element
- Cell, Row, Column, Range/Array, Name box
- Formatting of cells (Wrap Text, Number, Text, Cell formatting, commenting, etc)
- Ribbon, Formula bar, Status bar

- Basic operators (+,-,/,\*,%,>,<,>=,<=,( ),{ },[ ],&,' ', "" "" ,!) )
- Insert and remove hyperlinks

### **EXERCISE 3: Format Worksheets and Workbooks**

- Change worksheet tab color
- Rename a worksheet
- Change worksheet order
- Insert and delete columns or rows
- Change workbook themes
- Adjust row height and column width
- Insert headers and footers

### **EXERCISE 4: Format and Modify Text by using Functions**

- Format text by using RIGHT, LEFT, and MID functions
- Format text by using UPPER, LOWER, and PROPER functions
- Format text by using the CONCATENATE function

### **EXERCISE 5: Summarize Data by using Functions**

- Perform calculations by using the SUM function
- Perform calculations by using MIN and MAX functions
- Perform calculations by using the COUNT function
- Perform calculations by using the AVERAGE function
- Perform logical operations by using the IF function
- Perform logical operations by using the SUMIF function
- Perform logical operations by using the AVERAGEIF function
- Perform statistical operations by using the COUNTIF function

### **EXERCISE 6: Anchoring data**

- Referencing, Named ranges and its uses
- Absolute, Relative, Mixed referencing
- Name Manager, named ranges, Creating Tables
- Create functions using named ranges AND/OR referencing

### **EXERCISE 7: Referring data from different tables**

- Various types of Lookups, Nested IF
- Lookup, Vlookup, Nested Vlookup, Hlookup, Index, Index with Match function
- If, If with combination of AND/OR (multiple ways to get the output), IFERROR

### **EXERCISE 8: Referring data from different tables Advanced functions**

- rank, rand, rand between
- indirect with address & match, offset

### **EXERCISE 9: Data Handling: Data cleaning, Data type identification, Data restrictions**

- len, left, right, mid, concatenate, concat, find, substitute, text, trim
- second, minute, hour, day, week, month, quarter, year, workdayintl
- isnumber, isna, isnontext, iseven, isodd, isformula, iserror

### **EXERCISE 10: Data Handling: Formatting and Filtering**

- Conditional formatting (Icon sets/Highlighted color sets/Data bars/custom formatting),
- Sort, Advanced Sort, Filtering

### **EXERCISE 11: Data validation**

- Number Date & Time Validation
- Text and List Validation
- Custom validations based on formula for a cell
- Dynamic Dropdown List Creation using Data Validation – Dependency List
- Protecting cell, Array, range, sheet, Workbook

### **EXERCISE 12: Pivot Tables**

- Creating Simple Pivot Tables
- Basic and Advanced Value Field Setting
- Classic Pivot table
- Choosing Field
- Filtering PivotTables
- Modifying PivotTable Data
- Grouping based on numbers and Dates
- Calculated Field & Calculated Items

### **EXERCISE 13: Pivot Tables**

- Arrays Functions
- What are the Array Formulas, Use of the Array Formulas?
- Basic Examples of Arrays (Using ctrl+shift+enter).
- Array with if, len and mid functions formulas.
- Array with Lookup functions.
- Advanced Use of formulas with Array

### **EXERCISE 14: Create and Format Charts**

- Various Charts i.e. Bar Charts / Pie Charts / Line Charts
- Create a new chart
- Add additional data series
- Switch between rows and columns in source data
- Analyze data by using Quick Analysis
- Resize charts
- Add and modify chart elements
- Apply chart layouts and styles
- Move charts to a chart sheet

### **TEXT BOOKS:**

1. Microsoft Excel 2019 Formulas and Functions, Paul McFedries, Microsoft Press Publications
2. Excel 2019, Michael Alexander, Richard Kusleika, John Walkenbach, Wiley Publications
3. Professional Excel Development, Rob Bovey, Dennis Wallentin, Stephen Bullen, John Green, Addison Wesley Publications

**REFERENCES:**

1. Excel VBA Programming for Dummies, Michael Alexander and John Walkenbach
2. Excel Basics In 30 Minutes, Ian Lamont
3. Learn Excel 2016 Essential Skills, Mike Smart

**ONLINE RESOURCES:**

1. Microsoft Excel Tutorial for Beginners, [freeCodeCamp.org](https://www.freecodecamp.org)
2. Introduction to MS Excel, Simplilearn

## VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

**B.Tech. I Semester**

### (22SD5CS101) ELEMENTS OF COMPUTER SCIENCE AND ENGINEERING

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME						
D-D	PE	LR	CP	VV	SEE	TOTAL
10	10	10	10	10	-	50

**COURSE OBJECTIVE:**

- To study/demonstrate the concepts of computer with respect to it's hardware
- To identify the importance of software engineering principles and software process framework
- To introduce Operating Systems, Data Base Management concepts and to give the description of structure of Data Base systems
- To configure a network and build the web pages using HTML, CSS, XML
- To learn Autonomous systems and the need of Artificial Intelligence

**COURSE OUTCOMES:** After completion of the course, the student should be able to

**CO-1:** Analyze the working principles of functional units of a basic Computer

**CO-2:** Understand program development, the use of data structures and algorithms in problem solving

**CO-3:** Know the need and types of operating system, database systems

**CO-4:** Apply the significance of networks, internet, and WWW and cyber security

**CO-5:** Investigate the Autonomous systems and application of Artificial Intelligence

**COURSE ARTICULATION MATRIX:**

*(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)*

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	1	1	1	1	2	-	-	-	-	-	1	3	3	2	2	-
CO-2	2	3	3	2	2	-	-	2	2	2	2	3	3	3	3	-
CO-3	2	2	2	2	2	-	-	2	2	2	1	3	3	3	2	-
CO-4	2	2	2	-	2	2	2	2	2	-	1	3	3	2	2	-
CO-5	2	2	2	3	2	2	2	2	2	-	2	3	3	3	3	-

**LIST OF EXERCISES:**

**WEEK 1:** Identify the different components of Computer

**WEEK 2:** Demonstrate the assembling and disassembling of Hardware

**WEEK 3:** Usage of PowerPoint, Word, and Excel sheet

**WEEK 4:** Design and understand the need of Flowcharts and Algorithms

**WEEK 5:** Demonstrate the installation and features of Windows

**WEEK 6:** Demonstrate the installation and features of LINUX Operating Systems

**WEEK 7:** Understand & Implement the DDL

**WEEK 8:** Understand & Implement the DML commands

**WEEK 9:** Analyse the IP Address, LAN Setting and Network Crimping.

**WEEK 10:** Usage of Basic Networking commands

**WEEK 11:** Create Web pages using basic tags of HTML, XML & CSS



**WEEK 12: Case Study:** Design a sample Student webpage using basic tags of HTML, XML & CSS

**WEEK 13:** Implement Image and Video Processing Tools

**WEEK 14:** Internal Lab Exam

**TEXT BOOKS:**

1. Invitation to Computer Science, G. Michael Schneider, Macalester College, Judith L. Gersting University of Hawaii, Hilo, Contributing author: Keith Miller University of Illinois, Springfield.
2. Elements of computer science, Cengage

**REFERENCES:**

1. Fundamentals of Computers, Reema Thareja, Oxford Higher Education, Oxford University Press.
2. Introduction to computers, Peter Norton, 8th Edition, Tata McGraw Hill.
3. Computer Fundamentals, Anita Goel, Pearson Education India, 2010.

**ONLINE RESOURCES:**

1. [https://onlinecourses.swayam2.ac.in/cec19\\_cs06/preview](https://onlinecourses.swayam2.ac.in/cec19_cs06/preview)
2. [https://onlinecourses.swayam2.ac.in/nou20\\_cs03/preview](https://onlinecourses.swayam2.ac.in/nou20_cs03/preview)