Vision of the Institution

To ignite the minds of the students through academic excellence so as to bring about social transformation and prosperity.

Mission of the Institution

- To expand the frontiers of knowledge through Quality Education.
- To provide valued added Research and Development.
- To embody a spirit of excellence in Teaching, Creativity, Scholarship and Outreach.
- To provide a platform for synergy of Academy, Industry and Community.
- To inculcate high standards of Ethical and Professional Behavior.

Vision of CIVIL ENGINEERING Department

To give the nation qualitative Civil Engineers, who can contribute for the construction of a better world with sophisticated infrastructural facilities, eco-friendly houses, modern transportation facilities with a pollution free environment and to protect the precious natural resources of this planet.

Mission of CIVIL ENGINEERING Department

1. To shape the students into good entrepreneurs and to promote self-confidence and all-round development of the student personality through special lectures, practical training programs, field visits and technical seminars.
2. To train the students to acquire generic knowledge in the areas of Civil Engineering
3. To continuously update the physical infrastructure through modernization, thrust area development, R & D and other schemes
4. To generate knowledge base through sustained research and developmental efforts.
5. To produce engineers with self-confidence and overall personality who can be self-employed and generate employment opportunities to fellow engineers and take active part in nation building,
6. Keeping in view the challenges of the future.

Program Educational Objectives (PEOs)

PEO:1

The main objective of the faculty is to guide them by the principles of sustainable development and global inter connectedness with the civil structures, and make them to understand the impact of civil engineering projects how they effects the society and environment in case of failures.

PEO:2

To develop their communication skills(Oral, Written, Visual, Graphic modes) which makes them to participate actively in their communities and profession when working as team leaders or members.

PEO:3

An intensive training is provided to identify, formulate and solving engineering problems in technical areas appropriate CIVIL ENGINEERING.

PEO:4

To make them competent and engaged engineering professionals applying their technical and managerial skills in planning, designing and construction.

Program Outcomes (POs) of CE Department

Engineering Graduates will be able to:

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

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

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.

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.

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.

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.

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.

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

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

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.

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.

12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs) of CE Department

PSO 1:

An ability to learn constructional concepts and to implement them in the field work and to make the structural planning in a smarter way.

PSO 2:

To encourage young energetic engineers in technical and software skills in the field of Civil Engineering with innovative thoughts along with existing and future trends in constructional field.

PSO 3 :

The capability to integrate knowledge in constructional field work and to improve skills to become an entrepreneur.

ACADEMIC REGULATIONS

B.Tech FOUR YEAR DEGREE COURSE

R19 Regulations

(Applicable for the batches admitted from 2019-2020)

DEPARTMENT OF CIVIL ENGINEERING

VISHNU INSTITUTE OF TECHNOLOGY :: BHIMAVARAM

(Autonomous)

Approved by AICTE & Affiliated to JNTUK, Kakinada

Accredited with 'A' Grade by NAAC & NBA

Vishnupur, Bhimavaram, West Godavari Dist., Andhra Pradesh, India.
PIN - 534202

Email: info@vishnu.edu.in, Website: www.vishnu.edu.in

I YEAR II SEMESTER
CIVIL ENGINEERING
R19 SYLLABUS

Subject	Mathematics II				
Year/Semester	I B. Tech/II Sem	L	T	P	C
Regulation Year	2019-20	2	1	-	3

COURSE OBJECTIVES:

To enable the students to

1. make the students learn modeling various physical phenomena as first and second order PDE

2. learn techniques to solve as first and second order PDE .

Syllabus:

UNIT-I
FIRST ORDER PARTIAL DIFFERENTIAL EQUATIONS
Formation of Partial differential equations by elimination of arbitrary constants and arbitrary functions–
solutions of first order linear (Lagrange) equations and nonlinear equations-standard types

UNIT- II
HIGHER ORDER PARTIAL DIFFERENTIAL EQUATIONS
Solutions of Linear Partial differential equations with constant coefficients. RHS terms of the type $e^{ax + by}$,
Sin(ax+by), Cos (ax+by), $x^m y^n$. Classification of second order partial differential equations-
parabolic,elliptical and hyperbolic.

UNIT-III
APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS
Method of Separation of Variables-Applications to wave equation, heat conduction equation in one
dimensions and Laplace equation in two dimensions

UNIT-IV
LAPLACE TRANSFORMS
Laplace transform-Definition-conditions for existence,– Linear Property -Shifting Theorems, Laplace
transform of Standard Functions-Transforms of derivatives and integrals–Unit step function–Dirac delta
function. Inverse Laplace transforms by Partial fractions–Convolution theorem (without proof) – inverse by
convolution, Solving ordinary differential equations with constant coefficients.

UNIT-V
VECTOR DIFFERENTIATION
Vector Differentiation - Scalar and Vector Fields, Level surfaces, Directional Derivative, Gradient of a
Scalar Field, Divergence, Curl of a vector field and applications , Vector Identities

UNIT-VI
VECTOR INTEGRATION
Vector Integration - Line integral, work done, areas, Surface integrals.
Vector integral theorems - Green's theorem, Stokes theorem and Gauss Divergence theorem (All theorems
without proof) and applications areas ,surface areas and volumes.
Text Books:

1. B. S. Grewal, Higher Engineering Mathematics, 42nd Ed., Khanna Publishers, New Delhi, 2012
2. Erwin .Kreyszig,Advanced Engineering Mathematics,9th Ed., Wiley, 2012

References:
1. T.K.V.Iyengar, B. Krishna Ghandhi, S. Ranganathan and M.V.S.S.N.Prasad, Engineering Mathematics, Volume-I, 12th Ed., S. Chand Publishers, 2014
2. B. V. Ramana, Engineering Mathematics, 4th Ed., Tata McGraw Hill, New Delhi, 2009
3. D. S. Chandrashekharaiah, Engineering Mathematics, Volume 1, Prism Publishers, 2010
4. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, reprint, 2008

Course Outcomes:

After completing this course, the students will be able to

1. model first order linear and non-linear partial differential equations and solve analytically.
2. model higher order homogeneous & non homogeneous linear partial differential equations and solve analytically.
3. model physical problems of engineering like steady and unsteady heat conduction, vibration of string.
4. use of Laplace transforms in solving the differential equations with the initial and boundary conditions.
5. understand electric and magnetic fields and their physical significance.
6. compute line, surface and volume integrals and evaluate the work done, flux, potential functions.

Subject	Engineering Chemistry				
Year/Semester	I B. Tech/II Sem	L	T	P	C
Regulation Year	2019-20	2	1	0	3

COURSE OBJECTIVES:

1. Plastics are nowadays used in household appliances; also they are used as composites in aerospace and automotive industries.
2. Fuels as a source of energy are a basic need of any industry, particularly industries like thermal power stations, steel industry, fertilizer industry etc., and hence they are introduced.
3. The basics for the construction of galvanic cells are introduced. Also if corrosion is to be controlled, one has to understand the mechanism of corrosion which itself is explained by electrochemical theory.
4. With the increase in demand, a wide variety of materials are coming up; some of them have excellent engineering properties and a few of these materials are introduced.
5. Water is a basic material in almost all the industries, more so where steam is generated and also where it is supplied for drinking purposes.
6. Materials used in major industries like steel industry, metallurgical industries and construction industries and electrical equipment manufacturing industries are introduced.

Syllabus:

UNIT I

HIGH POLYMERS AND PLASTICS

Polymerization : Introduction- Methods of polymerization --Thermoplastics and Thermosetting plastics – Compounding and fabrication (4/5 techniques)- Preparation, properties and applications of polyethylene, PVC, Bakelite Teflon. Conducting polymers, Fiber Reinforced Plastics and Biodegradable Polymers.
Elastomers – Natural rubber - vulcanization – Synthetic rubbers : Buna S, Buna N and Thiokol – Applications of elastomers.

UNIT II

FUEL TECHNOLOGY

Fuels:- Introduction – Calorific value - HCV and LCV – Bomb calorimeter – Numerical problems – Coal – – Proximate and ultimate analysis –Significance of the analyses – Liquid fuels – Petroleum- Refining – Cracking – Petrol knocking – Diesel knocking - Octane and Cetane ratings – Anti-knock agents –Gaseous fuels – Natural gas, LPG and CNG. Biofuels- Biodiesel and Power alcohol

UNIT III

ELECTROCHEMICAL CELLS AND CORROSION

Galvanic cells (Construction and working) – Electro chemical series and uses of this series- Standard electrodes (Hydrogen and Calomel electrodes) Batteries: Dry Leclanche Cell - Ni-Cd cells - Li cells.
Corrosion:- Definition – Theories of Corrosion (dry and wet) – Formation of galvanic cells by different metals, differential aeration - waterline corrosion – Pitting corrosion - Factors which influence the rate of corrosion - Protection from corrosion: Methods of application on metals (Galvanizing, Tinning, Electroplating, Electroless plating).

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UNIT- IV

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CHEMISTRY OF ADVANCED MATERIALS

Nano materials:- Introduction- Top down and Bottom up approach – Carbon nano tubes and fullerenes: Characterization of nonmaterials by BET and TEM methods- self assembled layers- Types, Preparation (Arc discharge Laser ablation and Chemical Vapour Deposition methods) properties and applications.

Liquid crystals: - Introduction – Types – Applications

Superconductors: - Type-I & Type-II, properties &applications.

Green synthesis: - Principles – Aqueos phase method, Super critical fluid extraction and Biocatalytic methods of synthesis with examples.

<div align="center">

UNIT -V

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WATER TECHNOLOGY

Hard water: - units of hardness – Boiler troubles-Priming and foaming, Caustic embrittlement, Scale and Sludge formation - Softening of Hard water: Lime – Soda process, Zeolite process and Ion Exchange process Reverse Osmosis and Electro Dialysis.

Potable water- Sterilization and disinfection of water- Break point of chlorination- BIS and WHO standards.

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UNIT -VI

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CHEMISTRY OF ENGINEERING MATERIALS AND FUEL CELLS

Refractories: - Definition, classification, properties of refractories.

Lubricants: - Definition and mechanism of lubricants.

Cement: - Constituents, manufacturing, setting and hardening of cement- Decay of cement.

Insulators: - Thermal and electrical insulators - Applications.

Fuel cells: - Hydrogen Oxygen fuel cells – Methanol Oxygen fuel cells.

Standard Books:
1. Engineering Chemistry by Jain and Jain; Dhanpat Rai Publicating Co.
2. Engineering Chemistry by Shikha Agarwal; Cambridge University Press, 2015 edition.

Reference Books:
1. Engineering Chemistry by Prasanth Rath, Cengage Learning, 2015 edition.
2. A text book of engineering Chemistry by S. S. Dara; S. Chand & Co Ltd., Latest Edition

COURSE OUTCOMES:
1. The advantages and limitations of plastic materials and their use in design would be understood.
2. Fuels which are used commonly and their economics, advantages and limitations are discussed.
3. Reasons for corrosion and some methods of corrosion control would be understood.
4. The students would be now aware of materials like nano materials and fullerenes and their uses. Similarly liquid crystals and superconductors are understood.

The importance of green synthesis is well understood and how they are different from conventional methods is also explained.
5. The impurities present in raw water, problems associated with them and how to avoid them are understood
6. The commonly used industrial materials are introduced.

Subject	Engineering Graphics and Design				
Year/Semester	I B. Tech/II Sem	L	T	P	C
Regulation Year	2019-20	2	-	3	2.5

COURSE OBJECTIVE:
1. Engineering drawing being the principle method of communication for engineers, the objective is to introduce the students, the techniques of constructing the various types of polygons, curves and scales.
2. The objective is also to visualize and represent the 3D objects in 2D planes with proper dimensioning, scaling etc.

Syllabus:

UNIT I

Objective: To introduce the students to use drawing instruments and to draw polygons, Engg. Curves.

Polygons: Construction of regular polygons by general methods, inscribing and describing polygons on circles.
Curves: Ellipse, Parabola and Hyperbola by general methods, Tangent & Normal, and Ellipse by Oblong Method and Arcs of Circles Method. Cycloids, Involutes, tangent & normal for the curves.

UNIT II

Objective: To introduce the students to use scales and orthographic projections, projections of points & simple lines.

Scales: Plain scale, Diagonal scale and Vernier scale.
Orthographic Projections: Introduction to Projections, Horizontal plane, Vertical plane, Profile plane, importance of reference lines.
Projections of points in various quadrants.

UNIT III

Objective: The objective is to make the students draw the projections of the lines inclined to both the planes.

Projections of straight lines inclined to one plane, inclined to both the planes, traces

UNIT IV

Objective: The objective is to make the students draw the projections of the plane inclined to both the planes.

Projections of planes: inclined to one reference plane; inclined to both the reference planes.

UNIT V

Objective: The objective is to make the students draw the projections of the various types of solids in different positions inclined to one of the planes.

Projections of Solids – Projections of Prisms, Pyramids, Cones and Cylinders simple positions, the axis inclined to one of the reference planes and axis inclined to both the reference planes.

UNIT VI

Objective: The objective is to represent the object in 3D view through isometric views. The student will be able to represent and convert the isometric view to orthographic view and vice versa.

Conversion of isometric views to **ORTHOGRAPHIC** views;

Conversion of orthographic views to **ISOMETRIC** views

COURSE OUTCOMES:

Upon successful completion of this course, the student shall be able to:
1. Understand and construct the polygons and curves in engineering applications.
2. Visualize objects in 3D space and draw Orthographic Projections.
3. Interpret Orthographic and Isometric views of objects.

TEXT BOOKS:
1. Engineering Drawing by N.D. Bhatt, Charotar Publishing House Pvt. Ltd
2. Engineering Drawing by Agarwal & Agarwal, Tata McGraw Hill
3. Engineering Drawing + AutoCAD by K. Venugopal, V. Prabhu Raja, New Age

REFERENCE BOOKS:
1. Engineering Drawing by K.L.Narayana & P. Kannaiah, Scitech Publications
2. Engineering Graphics for Degree by K.C. John, PHI Learning
3. Engineering Graphics by PI Varghese, McGrawHill Publishers.
4. Engineering Drawing by P.S. Gill, S.K. Kataria & Sons

Subject	Problem Solving and Programming using Python				
Year/Semester	I B. Tech/II Sem	L	T	P	C
Regulation Year	2019-20	4	0	0	4

OBJECTIVES:
• Introduction to Scripting Language
• Exposure to various problems solving approaches of computer science

Syllabus:

UNIT – I
Introduction: History of Python, Need of Python Programming, Applications Basics of Python Programming Using the REPL(Shell), Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation.

UNIT – II
Types, Operators and Expressions: Types - Integers, Strings, Booleans; Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Expressions and order of evaluations Control Flow- if, if-elif-else, for, while, break, continue, pass

UNIT – III
Data Structures Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences. Comprehensions.

UNIT – IV
Functions - Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful Functions(Function Returning Values), Scope of the Variables in a Function - Global and Local Variables.

Modules: Creating modules, import statement, from. Import statement, name spacing,

Python packages, Introduction to PIP, Installing Packages via PIP, Using Python Packages

UNIT – V
Object Oriented Programming OOP in Python: Classes, 'self variable', Methods, Constructor Method, Inheritance, Overriding Methods, and Data hiding.

Error and Exceptions: Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User Defined Exceptions

UNIT – VI
Brief Tour of the Standard Library - Operating System Interface - String Pattern Matching, Mathematics, Internet Access, Dates and Times, Data Compression, Multithreading, GUI Programming, Turtle Graphics
Testing: Why testing is required?, Basic concepts of testing, Unit testing in Python, Writing Test cases, Running Tests.

OUTCOMES:

• Making Software easily right out of the box.
• Experience with an interpreted Language.
• To build software for real needs.
• Prior Introduction to testing software

TEXT BOOKS
1. Python Programming: A Modern Approach, Vamsi Kurama, Pearson
2. Learning Python, Mark Lutz, Orielly

Reference Books:
1. Think Python, Allen Downey, Green Tea Press
2. Core Python Programming, W.Chun, Pearson.
3. Introduction to Python, Kenneth A. Lambert, Cengage
4. Python Cookbook, O Reilly, David Beazley and Brain k.Jones

Subject	Elements of Electrical & Electronics Engineering			
Year/Semester	I B. Tech/II Sem	L	T	P	C
Regulation Year	2019-20	3	-	-	4

Course Objectives:
This course covers the topics related to analysis of various electrical circuits, operation of various electrical machines, various electronic components to perform well in their respective fields.
Learning Objectives:
1. To learn the basic principles of electrical law's and analysis of networks.
2. To understand the principle of operation and construction details of DC machines.
3. To understand the principle of operation and construction details of transformer.
4. To study the operation of PN junction diode, half wave, full wave rectifiers and OP-AMPs.
5. To learn the operation of PNP and NPN transistors and various amplifiers.

Syllabus:

UNIT - I

DC CIRCUITS:
Electrical circuit elements (R - L and C) - Ohm's-Law, Kirchhoff laws - Series and parallel connection of resistances with DC excitation. Mesh Analysis and Nodal Analysis. Superposition Theorem

UNIT - II

AC CIRCUITS :
Representation of sinusoidal waveforms - peak and rms values - phasor representation - real power - reactive power - apparent power - power factor - Analysis of single-phase ac circuits consisting of RL - RC - RLC series circuits.

UNIT - III

DC MACHINES:
Principle and operation of DC Generator - EMF equations - OCC characteristics of DC generator – principle and operation of DC Motor – Performance Characteristics of DC Motor - Speed control of DC Motor

UNIT - IV

AC MACHINES:
Principle and operation of Single Phase Transformer - OC and SC test on transformer - principle and operation of Induction Motor [Elementary treatment only]

UNIT V

RECTIFIERS & LINEAR ICs:
PN junction diodes, diode applications (Half wave and bridge rectifiers). Characteristics of operation amplifiers (OP- AMP) - application of OP-AMPs (inverting, non inverting, integrator and differentiator).

UNIT VI

TRANSISTORS:
PNP and NPN junction transistor, transistor as an amplifier, single stage CE Amplifier, frequency response of CE amplifier, concepts of feedback amplifier.

TEXT BOOKS:
1. Electronic Devices and Circuits, R.L. Boylestad and Louis Nashelsky, 9th edition, PEI/PHI 2006.
2. Electrical Technology by Surinder Pal Bali, Pearson Publications.
3. Electrical Circuit Theory and Technology by John Bird, Routledge Taylor & Francis Group

REFERENCE BOOKS:
1. Basic Electrical Engineering by M.S.Naidu and S.Kamakshiah,TMH Publications.
2. Fundamentals of Electrical Engineering by Rajendra Prasad, PHI Publications, 2nd edition.
3. Basic Electrical Engineering by Nagsarkar, Sukhija, Oxford Publications, 2nd edition.
4. Industrial Electronics by G.K. Mittal, PHI.

COURSE OUTCOMES:
1. Able to analyse the various electrical networks.
2. Able to understand the operation of DC generators,3-point starter and conduct the Swinburne's Test.
3. Able to analyse the performance of transformer.
4. Able to analyse the operation of half wave, full wave rectifiers and OP- AMPs.
5. Able to explain the single stage CE amplifier and concept of feedback amplifier.

Name of the Lab	Engineering Chemistry Lab				
Year/Semester	I B. Tech/II Sem	L	T	P	C
Regulation Year	2019-20	-	-	3	1.5

List of Experiments

1. Trial experiment - Determination of HCl using standard Na_2CO_3 solution.

2. Determination of alkalinity of a sample containing Na_2CO_3 and NaOH.

3. Determination of $KMnO_4$ using standard Oxalic acid solution.

4. Determination of Copper using standard $K_2Cr_2O_7$ solution.

5. Determination of temporary and permanent hardness of water using standard EDTA solution.

6. Determination of Vitamin – C

7. Determination of P^H of the given sample solution using P^H meter.

8. Conductometric titration between strong acid and strong base.

9. Potentiometric titration between strong acid and strong base.

10. Estimation of copper by Colorometry

11. Estimation of KCl by Ion exchange resin method.

12. Photo Chemical Reduction of Ferric Salt (Blue-Printing)

13. Adsorption of acetic acid on charcoal.

14. Determination of rate of corrosion.

15. Preparation of a polymer.

Reference Books:
1. A Textbook of Quantitative Analysis, Arthur J. Vogel.
2. Dr. Jyotsna Cherukuris (2012) Laboratory Manual of engineering chemistry-II, VGS
Techno Series
3. Chemistry Practical Manual, Lorven Publications
4. Practical Engineering Chemistry, K. Mukkanti (2009) B.S. Publication

Outcomes: The students entering into the professional course have practically very little exposure to lab classes. The experiments introduce volumetric analysis; redox titrations with different indicators; EDTA titrations; then they are exposed to a few instrumental methods of chemical analysis. Thus at the end of the lab course, the student is exposed to different methods of chemical analysis and use of some commonly employed instruments. They thus acquire some experimental skills.

Name of the Lab	Problem Solving and Programming Lab				
Year/Semester	I B. Tech/II Sem	L	T	P	C
Regulation Year	2019-20	-	-	3	1.5

List of Experiments

Exercise 1 – Basics

a) Running instructions in Interactive interpreter and a Python Script
b) Write a program to purposefully raise Indentation Error and correct it

Exercise 2 – Operations

a) Write a program to compute distance between two points taking input from the user
(Pythagorean Theorem)
b) Write a program add.py that takes 2 numbers as command line arguments and prints its sum.

Exercise - 3 Control Flow

a) Write a Program for checking whether the given number is a even number or not.
b) What is sequence? Write a program using a for loop that loops over a sequence.
c) Write a Program to print the multiplication table of a number using for loop.
d) Write a program using a while loop to count the number of digits of a number.

Exercise 4 - Control Flow – Continued

a) Find the sum of all the primes below two million.
Hint: Make use of sieve of erathosenes

Fibonacci series:
Each new term in the Fibonacci sequence is generated by adding the previous two terms. By
starting with 1 and 2, the first 10 terms will be:
1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...
b) By considering the terms in the Fibonacci sequence whose values do not exceed four million, find the
sum of the even-valued terms.
Hint: Use recursive formula for even Fibonacci numbers.

Exercise - 5 – DS

a) Write a program to get unique values from list.
b) Write a program to count the number of vowels in a string using sets.

Exercise - 6 DS - Continued
a) Write a program to count the numbers of characters (character frequency) in the string and store them in a
dictionary data structure
b) Write a program to use split and join methods in the string and trace a birthday with a
dictionary data structure.

Exercise - 7 Files
a) Write a program to print each line of a file in reverse order.
b) Write a program to compute the number of characters, words and lines in a file.

Exercise - 8 Functions

a) Write a function ball_collide that takes two balls as parameters and computes if they are colliding. Your function should return a Boolean representing whether or not the balls are colliding.
Hint: Represent a ball on a plane as a tuple of (x, y, r), r being the radius
If (distance between two balls centers) <= (sum of their radii) then (they are colliding)
b) Find mean, median, mode for the given set of numbers in a list.

Exercise - 9 Functions – Continued

a) Write a function nearly_equal to test whether two strings are nearly equal. Two strings a and b are nearly equal when a can be generated by a single mutation on b.
b) Write a function dups to find all duplicates in the list.

Exercise - 10 - Functions - Problem Solving

a) Write a function cumulative_product to compute cumulative product of a list of numbers.
b) Write a function reverse to reverse a list. Without using the reverse function.
c) Write function to compute gcd, lcm of two numbers. Each function shouldn't exceed one line.

Exercise 11 - Multi-D Lists

a) Write a program that defines a matrix and prints
b) Write a program to perform addition of two square matrices
c) Write a program to perform multiplication of two square matrices

Exercise - 12 – Modules

a) Install packages requests, flask and explore them. using (pip)
b) Write a script that imports requests and fetch content from the page. Eg. (Wiki)
c) Write a simple script that serves a simple HTTPResponse and a simple HTML Page
Exercise - 13 OOP

a) Class variables and instance variable and illustration of the self variable
i) Robot
ii) Hospital Billing System

Exercise - 14 GUI, Graphics

1. Write a GUI for an Expression Calculator using tk
2. Write a program to implement the following figures using turtle
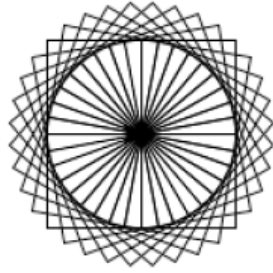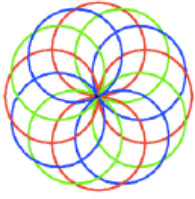
Exercise - 15 - Testing

a) Write a test-case to check the function even_numbers which return True on passing a list of all even numbers

b) Write a test-case to check the function reverse_string which returns the reversed string

Exercise - 16 - Advanced

a) Build any one classical data structure.

b) Write a program to solve knapsack problem.

Name of the Lab	Electrical & Electronics Engineering Lab				
Year/Semester	I B. Tech/II Sem	L	T	P	C
Regulation Year	2019-20	-	-	3	1.5

The following experiments are required to be conducted as compulsory experiments:

SECTION A: ELECTRICAL ENGINEERING

1. Verification of Kirchhoff's Laws
2. Verification of Superposition Theorem.
3. Swinburne's test on D.C. Shunt machine (Predetermination of efficiency of a given D.C. Shunt machine working as motor and generator).
4. OC and SC tests on single phase transformer (Predetermination of efficiency and regulation at given power factors).
5. Speed control of D.C. Shunt motor by
  a) Armature Voltage control b) Field flux control method
6. Brake test on D.C. Shunt Motor.

SECTION B: ELECTRONICS ENGINEERING

1. PN junction Diode characteristics A. Forward bias, B. Reverse bias. (Cut in voltage & Resistance calculations)
2. Transistor CE Characteristics (Input and Output).
3. Full wave Rectifier with and without filters.
4. CE Amplifiers.

Name of the Lab	Engineering Workshop				
Year/Semester	I B. Tech/II Sem	L	T	P	C
Regulation Year	2019-20	-	-	3	1.5

COURSE OBJECTIVE:
- To impart hands-on practice on basic engineering trades and skills.

Note: At least two exercises to be done from each trade.

TRADES:

Carpentry
1. T-Lap Joint
2. Cross Lap Joint
3. Dovetail Joint
4. Mortise and Tenon Joint

Fitting
1. Vee Fit
2. Square Fit
3. Half Round Fit
4. Dovetail Fit

Black Smithy
1. Round rod to Square
2. S-Hook
3. Round Rod to Flat Ring
4. Round Rod to Square headed bolt

House Wiring
1. Parallel / Series Connection of three bulbs
2. Stair Case wiring
3. Florescent Lamp Fitting
4. Measurement of Earth Resistance

Tin Smithy
1. Taper Tray
2. Square Box without lid
3. Open Scoop
4. Funnel

Subject	**Environmental Science**				
Year/Semester	**I B. Tech/II Sem**	**L**	**T**	**P**	**C**
Regulation Year	**2019-20**	**3**	**-**	**-**	**-**

COURSE OBJECTIVES:
1. To make the students get awareness on environment,
2. To understand the importance of protecting natural resources,
3. Ecosystems for future generations and pollution causes due to the day to day activities of human life to save earth from the inventions by the engineers.

Syllabus:

UNIT – I
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL SCIENCE AND ECOSYSTEMS

Definition, Scope and Importance and sustainability – Need for public awareness- Human population and Environment.
Ecosystems: Concept of an ecosystem. - Structure and function of an ecosystem. – Types of ecosystems-Forest, Grassland, Desert and Aquatic ecosystems- Food chains, food webs and ecological pyramids.

UNIT – II
NATURAL RESOURCES
Forest resources: Use and over – exploitation, deforestation – Timber extraction – Mining, dams and other effects on forest and tribal people
Water resources: Conflicts over water, dams – benefits and problems
Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.
Energy resources: Growing energy needs- renewable and non-renewable energy sources.
Food resources – World food problems
Land resources- Wasteland reclamation.
Role of an individual in conservation of natural resources.

UNIT – III
BIODIVERSITY AND ITS CONSERVATION
Definition: Genetic, species and ecosystem diversity- classification - Value of biodiversity: consumptive use, productive use, social - Biodiversity at national and local levels. Hot-spots of biodiversity - Threats to biodiversity - Endangered and endemic species of India - conservation of biodiversity.

UNIT – IV
ENVIRONMENTAL POLLUTION
Definition, Cause, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution, Nuclear hazards. Role of an individual in prevention of pollution. - Pollution case studies.
Solid Waste Management: Sources, effects and control measures of urban and industrial solid wastes.
Biomedical and e - waste management.
Global Environmental Challenges: Global warming and climate change, acid rains, ozone layer depletion.

UNIT – V
SOCIAL ISSUES AND THE ENVIRONMENT
Urban problems related to energy -Water conservation, rain water harvesting-Resettlement and rehabilitation of people. Environmental Protection Act –Air Act. –Water Act - Wildlife Protection Act - Forest Conservation Act- Public awareness.
International protocols: Stockholm and Rio Summit, Kyoto protocol and Montreal protocol.

UNIT – VI
ENVIRONMENTAL MANAGEMENT
Impact Assessment and its significance - various stages of EIA- Environmental audit, Ecotourism.
The student Visit of an Industry / Ecosystem.

TEXT BOOKS:
1. A Textbook of Environmental Studies, Shaashi Chawla, TMH, New Delhi.
2. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
3. Environmental Studies, R. Rajagopalan, 2nd Edition, 2011, Oxford University Press.

REFERENCE BOOKS:
1. Environmental Studies, K. V. S. G. Murali Krishna, VGS Publishers, Vijayawad
2. Text Book of Environmental Studies, Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
3. Text book of Environmental Science and Technology – Dr. M. Anji Reddy , BS Publications
4. Environment Studies, Anubha Kaushik, C P Kaushik, New Age International Publishers, 2014
5. Environmental Studies, P. N. Palanisamy, P. Manikandan, A. Geetha, and K. Manjula Rani; Pearson Education, Chennai

COURSE OUTCOMES:
Students will be able to
1. Articulate the basic structure, functions, and processes of key social systems affecting the environment.
2. Explain how Natural resources should be used.
3. Identify the threats to biodiversity.
4. Understand Causes, effects and control measures of environmental pollution.
5. Gain knowledge about watershed management and environmental ethics.
6. Gain a rigorous foundation in various scientific disciplines as they apply to environmental science, such as ecology, evolutionary biology, hydrology, and human behavior.