MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)
B. Tech I Year - I SEM (Common to all branches)

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FUNCTIONAL ENGLISH
(14ENG11T01)

Course Objectives:

The syllabus has been designed to enhance communication skills of the students of Engineering and Technology. The course enables students to communicate in English for academic and social purpose and helps them improve their grammatical accuracy and vocabulary. It also inculcates the habit of reading for pleasure.

Learning Outcomes:

Students will get the required training in LSRW skills through the prescribed text and develop their ability to communicate effectively. The course will help them acquire the adequate language and soft skills required by employers.

UNIT-1
Humour- An Astrologer's Day
Parts of Speech, Singular – Plural words, Kinds of Nouns & Pronouns, Articles
Word Formation: Prefixes, Suffixes and Compounds
Basics of Phonetics, Word Stress and Intonation
Making grammatical and meaningful sentences
Greeting, Taking Leave, Introducing Oneself & Others

UNIT -II
Inspiration – Building A State
Finite Verbs, Non-finite Verb forms, Question Tags
Homophones, Homonyms, Homographs, Synonyms, Antonyms, Commonly Confused
Words Paragraph Writing, Expansion of Proverbs, Note Making
Making Requests, Interrupting, Apologizing and Making polite conversations

UNIT-III
Sustainable Development – Water: The Elixir of Life
Tenses
One-Word Substitutes
Listening for the theme and the gist
Formal and Informal Letters
Giving Directions and Instructions, Making Suggestions, Offering Advice, Agreeing and Disagreeing

UNIT-IV

Relationships – The Wood Rose
Subject – Verb Agreement, Voice: Active and Passive, Prepositions.
Phrasal Verbs and Idioms
Listening for specific details and information
Information Transfer
Narrating, Expressing Opinions and Speaking on the Telephone

UNIT-V

Science and Humanism – Progress
Conditional Sentences, Conjunctions, Common Errors
Collocations, Technical Vocabulary, Common Vocabulary errors
Listening for Opinions and Attitude
E Mails
Story Telling

Text Book:

Using English published by Orient Blackswan

Reference Books:

1.*Raymond Murphy's Intermediate English Grammar with CD***,** Raymond Murphy, Cambridge University Press, 2012.
2.*Communication Skills***,** Sanjay Kumar &Pushpalatha,Oxford University Press, 2012.
3*. A Course in Communication Skills*, Kiranmai, Dutt& Co Foundation Books, 2012.
4.*Current English grammar and usage***,** S M Guptha, PHI, 2013.
5.*Powerful Vocabulary Builder,*AnjanaAgarwal, New Age International Publishers, 2011.
6.*Listening Extra*, Miles Craven, Cambridge University Press.
7.*Speaking Extra*, Mick Gammidge, Cambridge University Press.
8.*Reading Extra*, Liz Driscoll, Cambridge University Press.
9.*Writing Extra*, Graham Palmer, Cambridge University Press.
10.*Speak Well*, JayashreeMohanraj et al, Orient Blackswan.

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ADVANCED CALCULUS
(14MAT11T01)

1. Course Objectives: Calculus is needed in every branch of science & engineering, as all dynamics is modeled   through differential & integral equations. Functions of several variables appear more frequently in Science than functions of a single variable. Their derivatives are more interesting because of the different ways in which the variables can interact. Their integrals occur in several areas such as probability, fluid dynamics, and electrically, just to name a few. All these lead in a natural way to functions of severable variables. Mathematics of these functions is one of the finest achievements of modern Mathematics.

2. Learning Outcomes:
     At the end of this course, students should be able to obtain
➢ Ability to understand graphing and conic sections to trace the geometric shapes of various curves like Cartesian, polar and parametric relevant to the field of Engineering.
➢ The knowledge to work in functions of several variables provides mathematical solutions to various engineering problems.
➢ The knowledge of integral calculus and applications of integration to solve complex problems.
➢ Efficiency to apply tools for convergence of various tests and the series expansions necessary for engineering problems.

UNIT I   [10.5-10.8, Chap 2, 13.1,13.3,13.4,13.5]   **(12 hours)**
Polar coordinates and Curvature:
Polar coordinates, Graphing, polar equations of conic Sections, Integration, properties of limits, infinity as a limit, continuity and differentiability of vector functions , arc length, velocity and unit tangent vector, Curvature, Normal vector, Torsion and Binormal vector, Tangential and normal components of velocity and acceleration.

UNIT II   [14.1-14.8]   **(15 Hours)**
Functions of Severable Variables:
Functions of severable variables, level curves, Limits, Continuity, Partial derivatives, chain Rule, Directional derivative, gradient vectors, Tangent planes & normal line, Maximum, Minimum & Saddle points of functions of two or three variables, Constrained Maxima & Minima, Method of Lagrange multipliers.

UNIT III   [15.1, 15.3,15.4,15.6,15.7]   **(10 Hours)**
Multiple Integrals:
Double Integrals, Area, Change of integrals to Polar Coordinates, Change of order of integration, Triple Integral, Integral in Cylindrical and Spherical Coordinates.

UNIT IV   [16.1-16.5,16.7,16.8]   (12 Hours)
Vector Calculus:
Line integral, work, circulation, flux, path independence, potential function, conservative fields; Green's theorem in the plane, Surface area & Surface Integral; Stokes'theorem ,Gauss divergence theorem.

UNIT V   [11.1-11.8] [11.1-11.2 is for self-study]   (11 hours)
Sequence and Series:
Sequence of real numbers frequently occurring limits, infinite series different tests of Convergence, series of non-negative terms, absolute & conditional convergence, alternating series, Power series, Maclaurin series, Taylor series of functions.

Text Book:
> Weir, MD, Hass J, Giordano FR: Thomas' Calculus Pearson education 11th ED, 2007.

Reference Books:
1. Erwin Kreyszig - Advanced Engineering Mathematics, 8th Edition Wiley-India, 2007
2. James Stewart - Calculus, 5e, Cengage learning, 2003.
3. Monty J. Strauss, Gerald L. Bradley, & Karl J. Smith – Calculus 3rd Edition, Pearson 2007.

Self Learning Resources (websites)

1. http://www.nptelvideos.com/mathematics/
2. https://www.khanacademy.org/math/
3. http://ocw.mit.edu/courses/mathematics/
4. http://online.stanford.edu/
5. http://www.mooc-list.com/
6. http://mits.ac.in/library.php

UNIT-IV **MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE**
(AUTONOMOUS)

B. Tech I Year - I SEM (Common to all branches)

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ENGINEERING CHEMISTRY
(14CHE11T01)

Course Objectives:
- To impart students an in-depth knowledge of various aspects of chemistry as applied to engineering.
- To bridge the theoretical concepts and their practical engineering applications, thus highlighting the role of chemistry in the field of engineering.

Learning Outcomes:
After Completion of this course students will be able to
- Understand the fundamentals of water technology; corrosion and its control; applications of polymers in domestic and engineering area; types of lubricants and their applications; and recent trends in electrochemical energy storage devices.

UNIT-1

WATER TREATMENT AND ANALYSIS: Impurities in water, Hardness of water and its determination (EDTA Method), alkalinity. Chemical analysis of water: Dissolved Oxygen, Chlorides, Softening of water by Ion Exchange and Reverse Osmosis method. Water treatment for drinking purpose-coagulation, sedimentation, filtration, sterilization- chlorination and ozonization. Concept of break point chlorination.

UNIT -II

THERMODYNAMICS AND CHEMICAL KINETICS: Thermodynamics: Thermodynamic Systems, State Functions, Thermal Equilibrium and Temperature, Work, Internal Energy and Heat Transfer, Heat Capacity. Natural and Reversible Processes, Entropy and Second Law, Entropy Changes in (a) accompanying change of phase, isothermal and (c) isobaric processes. Standard free energy change in chemical reactions.
Chemical Kinetics: Rate Laws, Order, Rate Constants, Arrhenius Equation, Rate-determining step, Reaction mechanisms.

UNIT – III

INSTRUMENTAL METHODS OF ANALYSIS AND POLYMERS: Instrumental methods: Infrared spectroscopy-principle and applications. Chromatography – classification (paper, thin layer and gel permiation) and uses.
Nucleophilic substitution reactions (both S_N1 and S_N2) of alkyl halides. Elimination reaction of alkyl halides; Addition reactions to >C=C< bond. Classification of Polymers, Types of polymerization, Molecular weight of polymers- number average and weight average molecular weights, plastics, some important commercial thermoplastics and thermosetting resins, Elastomers, Synthetic rubbers.

ELECTROCHEMISTRY AND CORROSION: Types of electrolytes, Electrochemical cells, Electrode potential, Galvanic cells, Nernst equation, Measurement of EMF, types of electrodes, concentration cells, Batteries- Lead-acid, Ni-Cd, Lithium and Lithium ion batteries. Hydrogen-oxygen fuel cell-principle and applications.
Corrosion: Types of corrosion, Factors influencing rate of corrosion, Corrosion control methods, Protective coatings.

UNIT-V

ENGINEERING MATERIALS AND NANOSCIENCE: Cementing materials- Lime, Cement, Gypsum, Refractories, Abrasives, Insulators, lubricants. Liquid crystals – classification and applications
Lubricants – definition, classification, Extreme pressure lubrication mechanism, important properties – viscosity, viscosity index, saponification number, flash point and pour point.
Introduction to nanoscience and nanomaterials, synthesis – sol-gel and hydrothermal methods, characterization by powder XRD (Scherrer's equation) and photocatalytic application – dye degradation.

Text Books:

  1. P.W. Atkins & Julio de Paula, 'The Elements of Physical Chemistry', Fifth edition (Oxford University Press, Oxford 2009).
  2. T. W. Graham Solomons and Craig B. Fryhle, 'Organic Chemistry' 10th edition, John Wiley & Sons Inc., New York 2011.

Reference Books:

  1. D. W. Ball, 'Physical Chemistry', First Edition, India Edition (Thomson, 2007).
  2. L. G. Wade, Jr. and M. S. Singh, 'Organic Chemistry', 6th Edition, Pearson Education Inc., 2006.
  3. Perry and Green, Perry's Chemical Engineers' Handbook, 9th Edition, Section 2, McGraw Hill.
  4. Dr S. S. Dara and Dr S. S. Umare, A Text book of Engineering Chemistry, S. Chand & Company Ltd, 2000 1st Ed.
  5. Instrumetnal methods of chemical analysis—Willard Merrit, Dean Seatle.

UNIT-IV   MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)

B. Tech I Year - I SEM (Common to all branches)   L   T   P   C

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ENGINEERING GRAPHICS
(14ME11T01)

Course Objectives:
- Engineering Graphics is the primary medium for development and communicating design concepts. Through this course the students are trained in Engineering Graphics concepts with the use of **AutoCAD**. The latest ISI code of practice is followed.
- Computerized drawing is an upcoming technology and provides accurate and easily modifiable graphics entities easy data storage and retrieval facility and enhances creativity.

Learning Outcomes:
After Completion of this course students will be able to
- Draw Orthographic projections of different objects.
- Visualize 3-Dimensional objects and draw isometric projections.
- Use in techniques and able to interpret the drawings in various fields of engineering.

UNIT-I
Introduction to AutoCAD commands, simple drawings, Orthographic Projections-Theory, techniques, first angle projections, multi view drawing from pictorial views.

UNIT-II
Projections of points: Positions, notation system and projections.
Projections of lines: positions, terms used, different cases, traces of lines and finding true lengths, auxiliary projections.

UNIT-III
Projections of planes: positions, terms used, different cases and projections procedure
Projections of Solids: Projections of Regular Solids inclined to one planes.

UNIT-IV
Sections and Developments of Solids: Section Planes and Sectional View of Right Regular Solids-Prism, cylinder. True shapes of the sections.
Development of Surfaces of Right Regular Solids-Prism, Cylinder and their Sectional Parts.

UNIT-V   MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE
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Intersections of surfaces of solids: Intersection between: Line-plane, Plane-plane, line-solid, solid-solid.
Isometric Projections: Theory of isometric drawing, construction of isometric projection from orthographic.

Text Books:
1. D.M. Kulkarni, A.P. Rastogi and A.M. Sarkar., Engineering Graphics with AutoCAD, PHI Learning Private Limited, New Delhi 2009.

Reference Books:
1. Dhananjay A Jolhe, Engineering Drawing: with an introduction to AutoCAD, Tata McGraw Hill, 2008.
2. Warren J. Luzadder & Jon M. Duff Fundamentals of Engineering Drawing, 11th edition, Prentice Hall of India, New Delhi.

UNIT-V   MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)

B. Tech I Year - I SEM (Common to all branches)

L	T	C
2	1	2

ENVIRONMENTAL SCIENCE
(14CHE11T02)

Course Objectives:
- To make the students to get awareness on environment
- To under the importance of protecting renewable energy sources, biodiversity and pollution causes due to the day today activities of human life to save earth from the inventions of engineers.

Learning Outcomes:
After Completion of this course students will be able to
- Understand the natural environment and its relationship with human activities
- Analyze human impacts on the environment
- Integrate facts, concepts and methods from multiple disciplines and apply to the environmental problems
- Understand the role to be played by human beings towards pollution control

UNIT – I

MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES: Definition, Scope and Importance– Need for Public Awareness. Renewable energy Resources , Solar energy-solar cells, solar batteries, wind energy, wind mills, ocean energy, tidal energy and non-renewable energy resources, LPG, water gas, producer gas.
World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.

UNIT – II

ECOSYSTEMS: Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:
a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem d. Aquatic – Lake ecosystems.

UNIT – III

BIODIVERSITY AND ITS CONSERVATION: Introduction, Definition: genetic, species and ecosystem diversity – Bio-geographical classification of India –Value of biodiversity: consumptive use, Productive use, social, ethical and aesthetic values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-spots of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT – IV

ENVIRONMENTAL POLLUTION: Definition, Cause, effects and control measures of a. Air Pollution, b. Water pollution, c. Soil pollution, d. Marine pollution, e. Noise pollution, f. Nuclear hazards Solid Waste Management: Causes**,** effects and control measures of urban and industrial wastes – Disaster management: floods, earthquake, cyclone and landslides.

UNIT – V

SOCIAL ISSUES AND THE ENVIRONMENT: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting and watershed management –Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies Population growth, variation among nations, Population explosion.

Text Book:

3. Text book of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission, Universities Press, 2005.

Reference Book:

6. Environmental Science & Engineering by Dr. A. Ravikrishnan, Hitech Publishing Company Pvt. Ltd. 2013.

B. Tech I Year - I SEM (Common to all branches)

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CHEMISTRY PRACTICALS
(**14CHE11P01**)

Course Objectives:
- To impart students a better knowledge of various aspects of chemistry as applied to engineering.
- To bridge the theoretical concepts and their practical engineering applications, thus highlighting the role of chemistry in the field of Chemical engineering.

Learning Outcomes:
After Completion of this course students will be able to
- Carry out chemical analysis both volumetrically and instrumentally.

Volumetric Analysis
1. Estimation of total, permanent and temporary hardness of water by EDTA method.
2. Estimation of Copper (II) in water by Iodometry.
3. Estimation of alkalinity of water sample.
4. Estimation of Iron (II) in waste water by dichrometry.
5. Estimation of Dissolved Oxygen by Winklers method.

Instrumental Method of Analysis
1. Estimation of ferrous ion by potentiometric titration (redox titration).
2. Esimation of acid (HCl) by potentiometric acid-base titration.
3. Dissociation constant of weak electrolyte by conductometry
4. Determination of unknown strength of an acid solution by conductometric titration
5. Determination of manganese by colorimetry.
6. Determination of solubility product of sparingly soluble salt (AgCl or $PbSO_4$) by conductometric method.

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B. Tech I Year - I SEM (Common to all branches)	**3**	**0**	**2**

COMPUTING PRACTICALS
(14CSU11P01)

Course Objectives:
  ➢ To make the student understand problem solving techniques and their applications
  ➢ Students will be able to understand the syntax and semantics of python.
  ➢ Get acquaintances with classes and objects, stacks and queues using python.

Learning Outcomes:
After Completion of this course students will be able to
  • Apply problem solving techniques to find solutions to problems.
  • Able to use python effectively and implement solutions using it.
  • Be capable to identity the stack and queues for a given problem or application.
  • Improve logical and programming skills.

Week 1
  a) Develop animated models using scratch tool

Week 2
  a) Develop the flowchart for finding a number is even or odd.
  b) Develop a flowchart for displaying reversal of a number.
  c) Develop a flowchart for finding biggest number among three numbers

Week 3
  a) Develop a flowchart for swapping two values using functions.
  b) Develop a flowchart to sort the list of numbers.
  c) Develop a flowchart to find largest element in an array.

Week 4
  a) Implement Python script to read person's age from keyboard and display whether he is eligible for voting or not.
  b) Implement Python script to find biggest number between two numbers.

Week 5
  a) Implement Python Script to generate prime numbers series up to n.
  b) Implement Python Script to check given number is palindrome or not.
  c) Implement Python script to print factorial of a number.
Week 6

a) Implement Python Script to perform various operations on string using string libraries.
b) Implement Python Script to check given string is palindrome or not.

Week 7
a) Define a function max_of_three() that takes three numbers as arguments and returns the largest of them.
b) Write a program which makes use of function to display all such numbers which are divisible by 7 but are not a multiple of 5, between 1000 and 2000.

Week 8
a) Define a function which generates Fibonacci series up to n numbers.
b) Define a function that checks whether the given number is Armstrong.

Week 9

a) Write a program which accepts a sequence of comma-separated numbers from console and generate a list and a tuple which contains every number.
   Suppose the following input is supplied to the program:34,67,55,33,12,98. Then, the output should be: ['34', '67', '55', '33', '12', '98'] ('34', '67', '55', '33', '12', '98').
b) With a given tuple (1,2,3,4,5,6,7,8,9,10), write a program to print the first half values in one line and the last half values in one line.

Week 10
a) Write a python script to perform basic dictionary operations like insert, delete and display.
b) Write a python script to find frequency of words in a file using dictionaries.

Week 11
a) Write Python script to display file contents.
b) Write Python script to copy file contents from one file to another.

Week 12
a) Define a class named Rectangle which can be constructed by a length and width. The Rectangle class has a method which can compute the area.
b) Define a class named Circle which can constructed by radius. The derived classes Area, Circumference uses methods called calArea(), calCirc() respectively to calculate area, circumference of circle.

Week 13
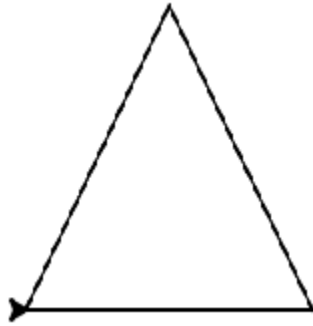a) Implement Python script to develop stack ADT and its operations.
b) Implement Python script to evaluate postfix expression.

Week 14

    a) Implement Python script to develop queue ADT and its operations.

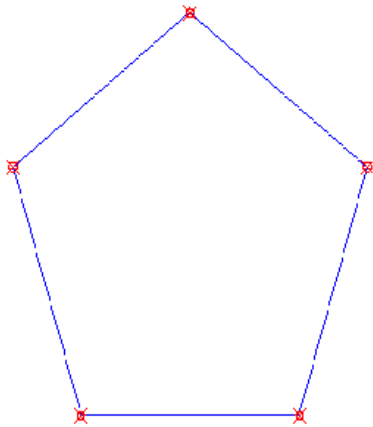 **b)** Implement Python script to perform tree traversals.

Week 15

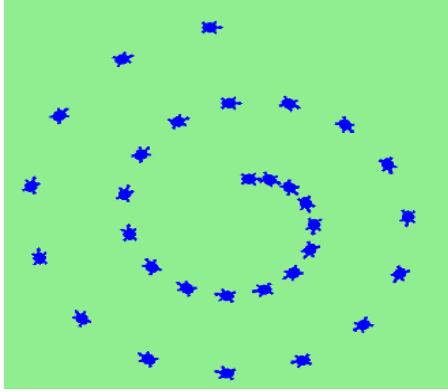Write a python script to display following shapes using turtle.
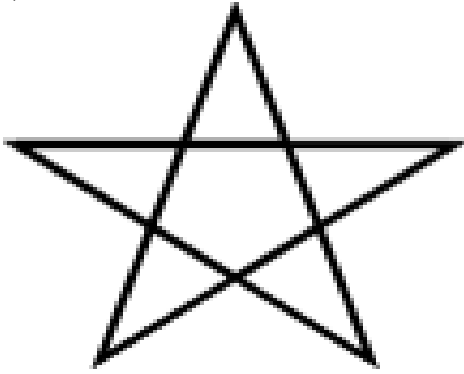

a)   **b)**

Week 16

Write a python script to display following shapes using turtle.

a)

b)

covered in Lecture hours

NOTE: Concepts related to Lab programs will be