**R V R & J C COLLEGE OF ENGINEERING (Autonomous), CHOWDAVARAM, GUNTUR-19**

**B.Tech., Computer Science & Engineering (IoT)**

## Semester - I (First Year)

| S.No | Course Code | Course Title | Hours Per Week | | Scheme of Examination | | | Category |
|---|---|---|---|---|---|---|---|---|
| | | | L | P | Internal Marks | Sem End Exam Marks | Credits | |
| 1 | CO/CS/IT/CM/CD 111 | Mathematics – I | 3 | 0 | 30 | 70 | 3 | BS |
| 2 | CO/CM/CD 112 | Engineering Chemistry | 3 | 0 | 30 | 70 | 3 | BS |
| 3 | CO/CM/CD 113 | English for Communication Skills | 3 | 0 | 30 | 70 | 3 | HS |
| 4 | CO/CM/CD/CB 114 | Fundamentals of Computer Science | 3 | 0 | 30 | 70 | 3 | PC |
| 5 | CO/CM/CD 151 | Engineering Chemistry Lab | 0 | 3 | 30 | 70 | 1.5 | BS |
| 6 | CO/CM/CD 152 | English Language Communication Skills Lab | 0 | 3 | 30 | 70 | 1.5 | HS |
| 7 | CO/CS/IT/CM/CD/CB 153 | Engineering Graphics and Design Lab | 1 | 4 | 30 | 70 | 3 | ES |
| 8 | CO/CS/IT/CM/CD 154 | Fundamentals of Computer Science Lab | 0 | 3 | 30 | 70 | 1.5 | PC |
| 9 | CO/CM/CD MC1 | Environmental Science | 2 | 0 | 100 | - | - | MC |
| 10 | | Three Weeks Orientation Program | - | - | - | - | - | |
| | | **TOTAL** | **15** | **13** | **340** | **560** | **19.5** | |

| Category | CREDITS |
|---|---|
| Basic Science Courses | 7.5 |
| Engineering Science Courses | 12 |
| **TOTAL CREDITS** | **19.5** |

**R V R & J C COLLEGE OF ENGINEERING (Autonomous), CHOWDAVARAM, GUNTUR-19**
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**CO/CS/IT/CM/CD 111** **Mathematics – I** **L P C**
**3 0 3**

**Course Objectives:**

The objective of this course is to familiarize the prospective engineers with techniques in basic calculus and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more a level of mathematics and applications that they would find useful in their disciplines.

**Course Outcomes:**

The students will able to:

1. Evaluate certain improper integrals apart from some other applications they will have a basicunderstanding of Beta and Gamma functions.
2. Apply Role's theorem which is fundamental application of analysis to Engineering problems.
3. Solve problems related to linear algebra including linear transformations in a Comprehensivemanner
4. Find Matrix Eigen values and know diagonalization and orthogonalization.

**Course Content:**

**UNIT I** **CO1** **15 Periods**

Evolutes and Involutes, Evaluation of improper integrals: Integrals without infinite limits of integration, Beta function, Gamma function, Relation between beta and gamma functions (without proof) Applications of definite integrals to evaluate surface areas and volumes of revolutions.

**UNIT II** **CO2** **11 Periods**

Rolle's theorem (without proof), Lagrange's mean value theorem (without proof), Taylor's and Maclaurin series, Sequences, Series, Series of positive terms, Convergence tests: Comparison test (limit form) D'Alembert's ratio test, Raabe's test for convergence.

**UNIT III** **CO3** **14 Periods**

Vectors: addition and scalar multiplication, linear dependence and independence of vectors. Vector space, basis, dimension; Linear transformations (maps), range and kernel of a linear map, rank and nullity, Inverse of a linear transformation, rank nullity theorem, composition of linear maps, Matrix associated with a linear map.

**UNIT IV** **CO4** **10 Periods**

Characteristic equation, Eigen values and eigenvectors, symmetric, skew-symmetric, and orthogonal Matrices, Eigen basis, Diagonalization; Inner product spaces, Gram-Schmidt orthogonalization

**Learning Resources:**

**Text Books:**

1. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 42nd edition.
2. V. Krishnamurthy, V.P. Mainra and J.L. Arora, An introduction to Linear Algebra, Affiliated East–West press, Reprint 2005.

**Reference Books:**

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, Pearson, 2002.
2. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
3. E. Kreyszig, "Advanced Engineering Mathematics", John Wiley & Sons, 2006.

**R V R & J C COLLEGE OF ENGINEERING (Autonomous), CHOWDAVARAM, GUNTUR-19**
**B.Tech., Computer Science & Engineering (IoT)**

**CO/CM/CD 112** **Engineering Chemistry** **L P C**
**3 0 3**

**Course Objectives:**

1. To develop concepts involved in molecular structure, intermolecular forces and make themunderstand the chemistry behind electrochemical energy systems.
2. To acquire knowledge on the chemical concepts involved in Water treatment and Corrosion.
3. Student shall know about the major organic reactions and end products like conductingpolymers.
4. Learn analytical methods useful in characterization of compounds.

**Course outcomes:**

**After successful completion of the course student shall be able to:**

1. Identify stable complexes and suitable electrochemical energy systems for end usage.
2. Apply his knowledge for effective water treatment and corrosion prevention.
3. Identify chemical reactions that are used in the synthesis of molecules and polymers
4. Distinguish the ranges of the electromagnetic spectrum and characterize a given compoundusing analytical techniques.

**Course Content:**

**UNIT I** **CO1** **14 Periods**

**Molecular structure, Intermolecular forces and Energy systems:**

Crystal field theory-salient features, energy level diagrams-tetrahedral and octahedral complexes, crystal field stabilization energies and magnetic properties.

Ionic, dipolar, Vander Waal's interaction and Hydrogen bonding, critical Phenomena- Andrew's isotherms of CO2, derivation of critical constants from Vander Waal's equation.

Electrode potential, electrochemical series, Nernst equation and its applications. Batteries- Primary (Dry cell) and secondary (Lead acid), Lithium battery (Li-MnO2)- advantages, Fuel cell (H2-O2 cell).

**UNIT II** **CO2** **11 Periods**

**Water Chemistry and Corrosion:**

Chemistry-WHO standards, Municipal water Treatment-Removal of suspended Impurities- Sedimentation, Co-angulation and Filtration-Disinfection of water by chlorine, Break point chlorination, DE chlorination, Purification by ion-exchange method and reverse osmosis.

Corrosion-Introduction, Electrochemical theory of corrosion, galvanic corrosion, differential aeration corrosion, Factors-temperature, pH, overvoltage. Cathodic protection by sacrificial anodic method and impressed current method. Electroplating (Cu), Electroless plating (Ni).

**UNIT III** **CO3** **12 Periods**

**Organic Reactions and Polymers:**

Types of organic Reactions-Substitution (SN1 and SN2), Elimination (E1 and E2), Addition-Markownikoff's rule and anti-Markownikoff's rule, Cyclisation (Diel's Alder reaction), Synthesis of aspirin.

Polymers-Functionality, Degree of Polymerization, Tacticity-Addition and condensation polymerization, Relationship between Structure and Properties of polymers (Strength, Crystallinity, Elasticity, Plastic Deformation, Glass transition temperature (To)), Factors affecting To.

**Conducting polymers:** Introduction, Examples, General applications, Mechanism of conduction in polyacetylene.

**UNIT IV** **CO4** **10 Periods**

**Spectroscopic techniques and its applications:**

Beer-Lambert's law, limitations, colorimetric determination of Fe(III) UV-VIS spectroscopy – electronic transitions, shifts-blue and red, Block diagram - brief introduction of components, Applications – purity and differentiation of conjugated and non-conjugated dienes. IR Spectroscopy–condition to be IR active, vibrational modes of–AB2, Block diagram-brief introduction of components, IR spectrum of CO2 and H2O molecules, General applications. Fluorescence and its applications in medicine.

**Learning Resources:**

**Text Books:**

1. Engineering chemistry, P.C. Jain and Monica Jain, 16th edition, Dhanpati Rai PublishingCompany.
2. Wiley Engineering chemistry, 2nd edition, Wiley India Private Limited.

**Reference Books:**

1. University Chemistry, Bruce H. Mahan, 3rd edition, Narosa Publishing House.
2. A text book of Engineering chemistry, Shashi Chawla, 3rd edition, Dhanpati Rai PublishingCompany.

**Web References:**

1. Engineering Chemistry (NPTEL Web Book by B.L. Tembe, Kamaluddin&M.S. Krishnan).
2. http://www.powerstream.com/BatteryFAQ.html#lec.
3. http://freevideolectures.com/Course/3029/Modern-Instrumental-Methods-ofAnalysis.

**R V R & J C COLLEGE OF ENGINEERING (Autonomous), CHOWDAVARAM, GUNTUR-19**
**B.Tech., Computer Science & Engineering (IoT)**

**CO/CM/CD 113** **English for Communication Skills** **L P C**
**3 0 3**

**Course Objectives:**

1. To enable students, improve their lexical and communicative competence and to equipStudents with oral and written communication skills.
2. To help students understand and learn the correct usage and application of GrammarPrinciples.
3. To get them acquainted with the features of successful professional communication.
4. To enable students, acquire various specific features of effective written communication.

**Course outcomes:**

**After successful completion of the course student shall be able to:**

1. Use vocabulary contextually.
2. Compose effectively the various forms of professional communication.
3. Apply grammar rules efficiently in spoken and written forms.
4. Improve clarity to locate and learn the required information.

**Course Content:**

**UNIT I** **CO1** **12 Periods**

**Vocabulary Building:**

1. Root words from foreign languages and their use in English.
2. Acquaintance with prefixes and suffixes from foreign languages in English to from derivatives.
3. Synonyms, Antonyms and Standard Abbreviations.
4. One word substitutes.

**UNIT II** **CO2** **8 Periods**

**Writing Skills:**

1. Proposal Writing.
2. Letter-Writing
3. Techniques for Writing precisely (Precis writing)

**UNIT III** **CO3** **10 Periods**

**Identifying Common Errors in Writing:**

1. Subject-verb agreement
2. Noun-pronoun agreement
3. Articles
4. Prepositions
5. Tenses Redundancies

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**UNIT IV** **CO4** **10 Periods**

**Nature and Style of sensible writing:**

1. Description & Narration. (Paragraph writing).
2. Essay Writing. (Expository Essay).
3. Note-Making and Note-Taking.
4. Methods of preparing notes.

**R V R & J C COLLEGE OF ENGINEERING (Autonomous), CHOWDAVARAM, GUNTUR-19**
**B.Tech., Computer Science & Engineering (IoT)**

**CO/CM/CD/CB 114** **Fundamentals of Computer Science** **L P C**
**3 0 3**

**Course Objectives:**

1. To impart adequate knowledge on the need of programming languages and problem solvingtechniques.
2. To develop programming skills using the fundamentals and basics of C Language.
3. To enable effective usage of arrays, structures, functions, pointers and to implement the memorymanagement concepts.
4. To teach the issues in file organization and the usage of file systems.

**Course outcomes:**

After successful completion of the course student shall be able to:

1. Enhance their analyzing and problem solving skills and use the same for writing programs in C.
2. Develop programs using the basic elements like control statements, Arrays and Strings.
3. Develop advanced applications using enumerated data types, function pointers and nested structures and ability to apply code reusability with user defined functions.
4. Learn the basics of file handling mechanism that is essential for understanding the conceptsin database management systems and to understand the uses of preprocessors and various header file directives.

**Course Content:**

**UNIT I** **CO1** **14 Periods**

**General problem Solving concepts:** Algorithm, and Flowchart for problem solving with Sequential Logic Structure, Decisions and Loops.

**Imperative languages:** Introduction to imperative language; syntax and constructs of a specific language (ANSI C) Types Operator and Expressions with discussion of variable naming and Hungarian Notation: Variable Names, Data Type and Sizes (Little Endian Big Endian), Constants, Declarations, Arithmetic Operators, Relational Operators, Logical Operators, Type Conversion, Increment Decrement Operators, Bitwise Operators, Assignment Operators and Expressions, Precedence and Order of Evaluation, proper variable naming and Hungarian Notation.

**UNIT II** **CO2** **13 Periods**

**Control Flow with discussion on structured and unstructured programming:** Statements and Blocks, If- else-If, Switch, Loops – while, do, for, break and continue, go to labels, structured and un- structured programming.

**Functions and Program Structure with discussion on standard library:** Basics of functions, parameter passing and returning type, C main return as integer, External, Auto, Local, Static, Register Variables, Scope Rules, Block structure, Initialization, Recursion, Pre-processor, Standard Library Functions and return types.

**UNIT III** **CO3** **10 Periods**

**Pointers and Arrays:** Pointers and address, Pointers and Function Arguments, Pointers and Arrays, Address Arithmetic, character Pointers and Functions, Pointer Arrays, Pointer to Pointer, Multidimensional array and Row/column major formats, Initialization of Pointer Arrays, Command line arguments, Pointer to functions, complicated declarations and how they are evaluated.

**Structures:** Basic Structures, Structures and Functions, Array of structures, Pointer of structures, Self referral structures, Table look up, type def, unions, Bit-fields.

**UNIT IV** **CO4** **10 Periods**

**Input and Output:** Standard I/O, Formatted Output–printf, Formatted Input–scanf, Variable length argument list, file access including FILE structure, fopen, stdin, sdtout and stderr, Error Handling including exit, perror and error.h, Line I/O, related miscellaneous functions. Unix system Interface: File Descriptor, Low level I/O – read and write, open, create, close and unlink, Random access – lseek, Discussions on Listing Directory, Storage allocator.

**Programming Method:** Debugging, Macro, User Defined Header, User Defined Library Function, make file utility.

**Learning Resources:**

**Text Books:**

1. The C Programming Language, (Second Edition) B. W. Kernighan and D. M. Ritchi, PHI.

**Reference Books:**

1. Programming in C, (Second Edition) B. Gottfried, Schaum Outline Series.
2. C: The Complete Reference, (Fourth Edition), Herbert Schildt, McGraw Hill.
3. Let Us C, Yashavant Kanetkar, BPB Publications.

**R V R & J C COLLEGE OF ENGINEERING (Autonomous), CHOWDAVARAM, GUNTUR-19**
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**CO/CM/CD 151** **Engineering Chemistry Lab** **L P C**
**0 3 1.5**

**Course Objectives:**

1. To know the methods of determining hardness and chloride ion content of water sample.
2. To learn the redox methods to determine Fe2+ ions present in solution.
3. To know principles and methods involved in using instruments like conductivity bridge andpotentiometer.
4. To know the molecular properties like surface tension, viscosity.
5. To know synthetic methods for preparation of drugs and polymer.

**Course outcomes:**

**After successful completion of the course student shall be able to:**

1. Estimate the Fe(II) content of a given solution and chloride/hardness content of water.
2. Measure conductance of solutions, redox potentials of a cell.
3. Synthesize a small drug molecule and polymer.
4. Measure molecular properties such as surface tension, viscosity and determine physical parameters like saponification value, partition co-efficient and Rf value.

**List of Experiments:**

1. Estimation of Mohr's salt using KMnO4.
2. Estimation of Mohr's salt using K2Cr2O7.
3. Determination of chloride ion content of water.
4. Determination of Hardness of water using EDTA method.
5. Determination of Fe(II) strength using K2Cr2O7 potentiometrically.
6. Determination on strength of NaOH using HCI conduct metrically.
7. Preparation of p-bromo acetanilide.
8. Preparation of Phenol Formaldehyde resin.
9. Determination of surface tension.
10. Determination of Viscosity.
11. Determination of Saponification / acid value of oil.
12. Determination of partition co-efficient of I2 in water. Determination of Rf value using TLC.
13. Verification of Freundlich isotherm using adsorption of acetic acid on activated charcoal.

**R V R & J C COLLEGE OF ENGINEERING (Autonomous), CHOWDAVARAM, GUNTUR-19**
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| CO/CM/CD 152 | English Language Communication Skills Lab | L | P | C |
|---|---|---|---|---|
| | | 0 | 3 | 1.5 |

**Course Objectives:**

1. To identify speaker's purpose and tone; make inferences and predictions about spoken discourse, discuss and respond to content of a lecture or listening passage orally and/or in writing.
2. To acquaint the students with the Standard English pronunciation, i.e., Receive Pronunciation (RP), with the knowledge of stress and intonation.
3. To develop production and process of language useful for social and professional life.
4. To develop in them communication and social graces necessary for functioning. Improve thedynamics of professional presentations.
5. To develop critical reading and comprehension skills at different levels

**Course outcomes:**

After successful completion of the course student shall be able to:

1. Comprehend relationships between ideas and make inferences and predictions about spoken discourse.
2. Speak English with a reasonable degree of accuracy in pronunciation.
3. Develop appropriate speech dynamics in professional situations.
4. Use effective strategies and social graces to enhance the value of communication.
5. Develop effective communication and presentation skills and using language effectivelyto face interviews with success.

**List of Experiments:**

1. Listening Comprehension.
2. Pronunciation, Intonation, Stress and Rhythm.
3. Common Everyday Situations: Conversations and Dialogues.
4. Interviews.
5. Formal Presentations.
6. Reading Comprehension.

**Textbooks:**

1. Communication Skills. Sanjay Kumar and Pushpa Lata. Oxford University Press.
2. Practical English Usage. Michael Swan. OUP. 1995 Press.
3. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University. Technical English M. Sambaiah, Wiley Publications, New Delhi

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**CO/CS/IT/CM/CD/CB 153** **Engineering Graphics & Design Lab** **L P C**
**1 4 3**

**Course Objectives:**

The course will enable the students to

1. Expose the students to standards and conventions followed in preparation of engineering drawings.
2. Make them understand the concepts of orthographic and isometric projections
3. Develop the ability of conveying the engineering information through drawings.
4. Make them understand the relevance of engineering drawing to differentengineering domains.
5. Develop the ability of producing engineering drawings using drawing instruments.
6. Enable them to use computer aided drafting packages for the generation of drawings.

**Course Outcomes:**

Upon completion of this course, students will be able to

1. Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.
2. Produce computer generated drawings using CAD software.
3. Use the knowledge of orthographic projections to represent engineering information / concepts and present the same in the form of drawings.
4. Develop isometric drawings of simple objects reading the orthographic projections of thoseobjects.
5. Convert pictorial and isometric views of simple objects to orthographic views. (**UNIT I to IV** shall be taught in conventional drawing method and Unit V shall be taught with theaid of computer).

**Course Contents:**

**UNIT – I**

**General:** Principles of Engineering Graphics and their significance, usage of drawing instruments, lettering.

**Conic sections:** Construction of Ellipse, Parabola, Hyperbola and Rectangular Hyperbola. (General method only).

**Curves:** Cycloid, Epicycloid, Hypocycloid and Involute; and Scales.

**UNIT – II**

**Method of Projections:** Principles of projection - First angle and third angle projection of points, Projection of straight lines inclined to both planes. Traces of lines.

**Projections of planes**: Projections of planes inclined to both the planes, projections on auxiliaryplanes.

**UNIT – III**

**Projections of Regular Solids:** Projections of solids (Prism, Pyramid, Cylinder and Cone) with varyingpositions.

**Sections of Solids:** Sections of Prisms, Pyramids, cylinders and Cones. True shapes of sections. (Limitedto the cutting plane perpendicular to one of the principal plane).

**Development of surfaces:** Development of surfaces of Right Regular Solids - Prism, Pyramid, Cylinder and Cone; Draw the sectional orthographic views of geometrical solids, objects from industry and dwellings (foundation to slab only).

**UNIT IV**

**Isometric Projections:** Principles of Isometric Projection-Isometric Scale, Isometric Views, Conventions;Isometric Views of lines, Planes, Simple and compound Solids.

**Orthographic Projections:** Conversion of pictorial views into Orthographic views and Vice-versa.(Treatment is limited to simple castings).

**Perspective Projections:** Introduction to Perspective Projection.

**UNIT V**

**Over view of Computer Aided drafting (AutoCAD):** Introduction, starting and customizing AutoCAD screen, usage of different menus, toolbars (drawing, editing, dimension, text, object properties.etc), tabs (Object, snap, grid, polar, ortho, otrack.etc.) and command prompt. Setting units, limits, layers and viewports (Isometric, Top, Front, back, etc.). 2D drawings of various mechanical and structural components, electrical and electronic Circuits. Orthographic and Isometric views of mechanical castings and simple structures.

**Learning Resources:**

**Text Book:**

1. Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar PublishingHouse.

**Reference Books:**

1. Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education.
2. Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication.
3. Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, ScitechPublishers.
4. (Corresponding set of) CAD Software Theory and User Manuals.

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| CO/CS/IT/CM/CD 154 | **Fundamentals of Computer Science Lab** | L | P | C |
|---|---|---|---|---|
| | | 0 | 3 | 1.5 |

**Course Objectives:**

The objectives of the course are, to make the student understand:

1. Basic problem solving process using Flow Charts and algorithms.
2. Basic concepts of control structures in C.
3. Concepts of arrays, functions, pointers and Dynamic memory allocation in C.
4. Concepts of structures, unions, files and command line arguments in C.

**Course Outcomes:**

After successful completion of the course, the students are able to

1. Develop algorithms and flow charts for simple problems.
2. Use suitable control structures for developing code in C.
3. Design modular programs using the concepts of functions and recursion.
4. Develop code for complex applications using structures, pointers and file handling features.

**List of Exercises / Activities:**

[The laboratory should be preceded or followed by a tutorial to explain the approach or algorithmto be implemented for the problem given].

1. Algorithm and flowcharts of small problems like GCD
2. Structured code writing with:
    a. Small but tricky codes
    b. Proper parameter passing
    c. Command line Arguments
    d. Variable parameter
    e. Pointer to functions
    f. User defined header
    g. Make file utility
    h. Multi file program and user defined libraries
    i. Interesting substring matching / searching programs
    j. Parsing related assignments

**Note:** A minimum of 10(Ten) experiments have to be Performed and recorded by the candidateto attain eligibility for Semester End Practical Examination.

**R V R & J C COLLEGE OF ENGINEERING (Autonomous), CHOWDAVARAM, GUNTUR-19**
**B.Tech., Computer Science & Engineering (IoT)**

**CO/CM/CD MC1** **Environmental Science** **L P C**
**2 0 -**

**Course Objectives:**

To enable the students to

1. Understand that humans are an integral part of environment and hence their activities reflect on theenvironment.
2. realize and appreciate the importance of ancient practices and their importance in the present times
3. appreciate the contribution of individuals for the upkeep of environmental standards, in turn helpthe humans live better.

**Course Outcomes:**

After successful completion of the course, the students are able to

1. Evaluate the implications of human activities and thereby promote ecofriendly technologies.
2. Promote awareness among the members of the society for a sustainable environment.
3. Include and give priority to environmental protection in all developmental projects.

**Course Content:**

A. AWARENESS ACTIVITIES - SMALL GROUP MEETINGS
   I. Source of water for human consumption/activities:
      a. collection of information pertaining to water resources and consumption inAndhra Pradesh
      b. Water resource on campus: General / Laboratory use and
      c. Drinking water - understand the background and adopt judicious management
      d. Recycled water for Gardening - Particularly Lawns
      e. Cut down wastage of electricity in class rooms / labs / hostels etc. by avoidingmisuse
   II. After the group meetings and exposure to the local issues and healthy practices, studentsmotivated to make:
      a. Posters
      b. Slogans/One liners for promoting awareness
   III. Lectures from Experts (at least 2 in the course duration).
   IV. A walk in the neighborhood to promote a chosen theme on environmental consciousness.

B. ACTUAL ACTIVITIES
   1. Plantation on Campus and on the sides of approach road.
   2. Distribution of saplings to the local colony dwellers and encourage plantation.
   3. Development of Kitchen garden on campus - Cultivation of at least leafy vegetables andcreepers like cucumber etc. for use in college canteen/hostels etc.
   4. Adoption of ''NO PLASTICS'' on campus.
   5. Field trip to gain knowledge of biodiversity, water shed, mining, pollution and other local issues.
   6. Preparation of working models for energy generation/transformation etc.

C. THEORY SYLLABUS FOR ASSESSMENT.

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**Part-I**

1. Introduction to Environmental Studies, Scope and Importance.
2. Natural resources Renewable and Non-Renewable; Definition and importance of the followingresources in detail: a. Forest b. Water c. Land d. Energy
3. Sustainable development - Concept and Measures.
4. Biodiversity - Definition, Types of Biodiversity, Values and threats to Biodiversity, Conservation of biodiversity, IUCN classification: Endangered, Threatened, Vulnerable, Rare species; Endemic and Exotic species.
5. Climate change - Global warming, Ozone depletion and Acid rain.

**Part-II**

6. Water shed, water shed management in detail.
7. Solid wastes and Solid waste management.
8. Environmental Legislation, Environmental acts - Wild life protection act, Water act, Forest conservation act, Air act and Environmental protection act.
9. Case studies: Chernobyl nuclear disaster, Bhopal gas tragedy, Narmada bachaoandolan, Silent valley,Story of Tuvalu, Story of Ganga.
10. Earth summit and Kyoto protocol; Measures at individual level for conservation of natural resourcesand sustainable development.

**Learning Resources:**

**Text Books:**

1. Anubha Kaushik and C.P. Kaushik - Environmental Studies, 3rd Edition, New Age InternationalPublishers, New Delhi., 2012.
2. R. Rajagopalan - Environmental studies from crisis to cure, 3rd Edition, Oxford University press, 2012.

**Assessment:**

1. Two assessments each of 40 marks will be done in the semester. The split up of each assessment isas follows:
2. Two internal theory examinations will be conducted for 18 marks each.
3. Evaluation of the prepared activity sheets and working models will be done for 12M (continualevaluation) twice in the semester in line with the theory examination.

5 Marks for attendance and 5 marks for oral test