KAKATIYA UNIVERSITY, WARANGAL.

ACADEMIC REGULATIONS

FOR FOUR-YEAR B.TECH. DEGREE PROGRAMMES

1.0. MINIMUM QUALIFICATION FOR ADMISSION

Candidates seeking admission to 1st Year of the Four-year B.Tech. degree programme shall have passed the Intermediate Examination of the Board of Intermediate Education, Andhra Pradesh with Mathematics and Physical Sciences (Physics and Chemistry) as optional subjects or any other examination recognised by the Kakatiya University as equivalent to it.

2.0 CONFERMENT OF THE DEGREE

The degree of Bachelor of Technology in a specified Branch of Engineering will be conferred on a candidate who has fulfilled the following conditions:

2.1 The candidate, after admission to the first year of the four-year B.Tech. degree programme, has persued a regular course of study for not less than 4 academic years in an engineering college, affiliated to Kakatiya University, Warangal and

2.2 The candidate must have satisfied the academic requirements of the specified branch of engineering in each semester/ year hereinafter prescribed.

3.0 THE PROGRAMMES OF STUDY

The programmes of study prescribed for the degree of Bachelor of Technology shall provide for specialisation in the following branches.

    3.1   Civil Engineering

    3.2   Computer Science & Engineering

    3.3   Electrical & Electronics Engineering

    3.4   Electronics & Communication Engineering

    3.5   Electronics & Instrumentation Engineering

    3.6   Information Technology

    3.7   Mechanical Engineering

    3.8   Production Engineering

4.0 REGULAR PROGRAMME OF STUDY

A candidate will be deemed to have persued a regular prograrmme of study as a full time student provided he/she satisfied the following conditions:

4.1 The student cannot be an employee of any Government or Private Organisation except when on an appropriate leave for the duration of the study, and

4.2 The candidate must not have enrolled as a student in any other degree or diploma Programme recognised by the Government or Kakatiya University.

5.0 ATTENDANCE REQUIREMENTS

5.1 Attendance requirements of a semester / year shall be deemed to have been satisfied provided:

5.1.1 The candidate puts in a minium attendance of 60 percent in each course of instruction prescribed for the semester / year.

NOTE:

The attendance in case of tutorials, drawing and practicals shall be counted on the basis of the contact hours provided in the scheme of instruction and not on the sessions of engagement. The attendance at the mid-session tests and University examinations shall not be considered in the computation of the percentage of attendance.

5.2 A candidate, who failed to satisfy the above requirements of attendance shall be detained and will not be permitted to appear at the University examinations of that semester / year. In view of the low percentage of attendance prescribed as the minimum requirement, there shall be no provision for condonation of attendance shortage on any ground whatsoever.

5.3 The candidate, who has been detained for failure to satisfy the requirements of attendance shall be required to re-register and repeat the whole programme of the semester/year when it is next offered.

6.0 DURATION OF AN ACADEMIC YEAR AND A SEMESTER

6.1 The first year of the B.Tech. degree programme shall consist of 144 days of instruction, excluding the period of mid-session tests and the annual University examinations.

6.2 The second and subsequent years of the B.Tech. degree programmed will have two semesters and each of such semesters shall consist of 72 days of instruction, excluding the mid-session tests and the University examinations.

7.0 REGISTRATION

7.1 All students are required to get themselves registered for the course work by paying the prescribed tuition fee within the first fifteen days of each academic year failing which they shall not be allowed to attend the course work prescribed for that academic year.

7.2 In case of admissions made by designated authority like the Convenor of EAMCET, the registration period of 15 days shall be counted from the date of issue of the admission card by the concerned authority.

7.3 Candidates detained due to shortage of attendance are to register within 7 days of commencement of class work of the next academic session and pay

the prescribed tuition fee within the first fifteen days of each academic year failing which they shall not be allowed to attend the course work prescribed for that academic year.

7.4   Registration shall be solely the responsibility of the student.

8.0   EVALUATION

8.1   The performance of the student in the first year and every semester thereafter shall be evaluated course-wise as detailed in the scheme of instruction and evaluation.

8.2   The pattern of allocation of marks for University Examinations and sessional work shall be the following.

8.2.1   Theory courses:

University Examinations	100
Sessional Work (Mid Exams)	50

Note.   In the subject environmental Studies

University Examinations	50
Internal Assessment	25
Field Work	25

8.2.2   Practical, design and drawing courses:

	Design & Drawing	Practicals
University Examinations	100	50
Sessional Work:		
Day to day work	25	{25}
Viva -Voce/Quiz/Practical Test	25	

8.2.3   Project Work:

University Examination	100
Sessional Work / each semester	
First Semester	100
Second Semester	100
Total:	300

8.3   Sessional evaluation of theory courses in the first year shall be based on two mid-session tests each of two hours duration. The mid-session tests will be conducted after completion of 45 and 95 days of instruction with part of syllabus covered upto 1st mid, and from Ist to 2nd mid, 2nd mid to 3rd mid exams for the respective mid examinations ("Part of syllabus" will be decided by the concerned faculty member(s) in consultation with Head of the

Department and the Principal of the Institute). In case of candidates ,who have appeared at all the three tests, the best performance at two out of three tests shall be considered for the award of sessional marks. Each of the tests considered shall have the same weightage.

8.4 Sessional evaluation of theory courses in each of the semesters of 2nd and subsequent years shall be based on a mid-session test of two hours duration conducted approximately after 35 days of instruction and with part of syllabus covered, upto 1st mid and from 1st to 2nd mid exam for respective mid examinations. ("Part of syllabus" will be decided by the concerned faculty member(s) in consultation with Head of the Department and the Principal of the institute). In case of candidates who have appeared at both the tests the better performance at the two tests shall be considered for the award of sessional marks.

8.5 Sessional evaluation of practical, design and drawing courses shall, in addition to day to day work, be based on Viva-voce/Quiz/Practical tests. While Viva-voce may be conducted on a continuing basis throughout the semester / year, the quiz / practical tests shall be conducted once in the semester / year after the last day of instruction.

8.6 Sessional evaluation of the project work shall be made jointly by a departmental project-advisory committee and the project supervisor on the basis of a minimum of two presentations/semester and assessment of the contribution made by the individual student.

8.7 The University examination in the project work shall be conducted by an internal and an external examiner and shall be based on the assessment of the project report and a viva-voce examination.

9.0 MINIMUM REQUIREMENTS FOR PASSING A COURSE:

9.1 A candidate is deemed to have passed in a course if he secures 35 percent of the marks assigned to the University examination of the course, and

9.2 35 percent of the marks assigned to the sessionals and University Examination of the course taken together.

10.0 CONDITIONS FOR PROMOTION

A candidate will have to satisfy the attendance requirements for the year / semester for promotion to the next higher semester . in addition,

10.1 For promotion to the 1st semester of 3rd year, a candidate should not have more than four backlog courses of 1st year.

10.2 For promotion to the first semester of IV year, a candidate should not have more than four backlog courses of 1st year and 2nd, year taken together.

10.3 The marks secured in the subject "Environmental Studies" will not be considered for the purpose of counting back logs. However, pass in the annual examination is compulsory for the award of degree.

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11.0 SUPPLEMENTARY EXAMINATIONS

A candidate who failed in a course (theory or practical) can appear at a subsequent University examination in the same course as a supplementary candidate to fulfil the minimum requirements for securing a pass in that course. However, the sessional marks secured by the candidate in that course during the semester/year of study shall remain unaltered.

12.0 IMPROVEMENT EXAMINATION

A candidate may opt to reappear at the immediately succeeding University examination of a semester/ year for improving his/her performance. However, when once the candidate registers for the improvement examination he/she shall forgo the marks secured in the earlier University examination in the whole set of courses prescribed for that semester/year but shall retain the sessional marks.

13.0 ELIGIBILITY FOR AWARD OF B.TECH. DEGREE

13.1   A candidate shall be deemed to have satisfied the requirements for the award of the B.Tech. degree provided he/she passes in all the courses including environmental studies (theory and practical) prescribed in the scheme of instruction within a period of eight consecutive years from the year of admission to the programme.

13.2   A candidate who fails to fulfil all the requirements for the award of B.Tech. degree in a period of eight consecutive academic years from the year of his/her admission to the B.Tech. degree programmes shall forfeit his/her enrolment to the programme.

13.3   For the students admitted in the lateral entry scheme their award of division is based on aggregate marks obtained in I & II semesters of II, III & IV Year subjects.

14.0 AWARD OF DIVISION

The weightage for award of degree is 50% of marks in aggregate of 1st and 2nd year and 100% of marks in aggregate in 3rd and 4th year put together. However, the marks secured in the subject "Environmental Studies" will not be considered for award of class/division.

Division is awarded as follows:

14.1   Single attempt in every exam.

       Securing 70% or more in aggregate   ..   1 st class with Distinction

14.2   Securing 60% or more in aggregate   ..   1 st class

14.3   Securing less than 60% and more than 40% in aggregate   ..   2nd class

15.0 GENERAL

15.1 The award of degree to a candidate shall be withheld if.-

15.1.1 He/she has not cleared dues to the institution / Hostel and / or

15.1.2 A case of disciplinary action is pending against him/her.

15.2 The marks secured in sessional evaluation and University examinations shall be shown separately in the marks sheet.

15.3 Supplementary examinations for First year B.Tech. and even semesters of subsequent years shall be conducted along with the regular examinations of odd semesters. Similarly the supplementary examinations of odd semesters shall be conducted along with the regular examinations of First year and the even semesters of the subsequent years.

15.4 If a candidate who has persued a regular programme of study of any year/semester wishes to repeat that year/semester to improve his/her performance, he/she may be permitted to enroll again as a regular student for that year/semester when it is next offered, depending on the availability of seats, provided that he/she undertakes to forgo the attendance and sessional / University examination marks secured by him/her for that year/ semester previously and provided further that he/she has not undergone a regular programme of study in any higher semester. This opportunity shall be given only once for each year/semester.

15.5 Whenever ambiguities arise in interpreting the regulations, the Standing Committee of Kakatiya University shall have the power to make rules or to issue clarifications for removing such ambiguities.

15.6 The Academic Regulations should be read as a whole for purpose of any interpretation.

These academic regulations shall come into force from the year 2004-2005 for the batches of students who will be admitted in 2004-2005 and subsequent academic years and those students who were admitted prior to 2004-2005 but join the batches admitted in 2004-2005 or subsequent years due to failure.

KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE: WARANGAL – 506 015.

SCHEME OF INSTRUCTION AND EVALUATION

FIRST YEAR OF 4-YEAR B.TECH. DEGREE PROGRAMME
(COMMON TO ALL BRANCHES)

Course No.	Course	Periods of Instruction per week			Evaluation Scheme			Total Marks
					External Evaluation		Sessionals	
		Lectures	Tutorials	Practical / Drawing	Duration of Exam (hours)	Max. marks	Max. marks	
HS 101	Communicative English	2	-	1	3	100	50	150
HS 102	Mathematics – I	3	1	-	3	100	50	150
HS 103	Applied Physics	2	-	-	3	100	50	150
HS 104	Engg. Chemistry	2	-	-	3	100	50	150
CE 105	Engg. Mechanics	3	1	-	3	100	50	150
CS 106	Programming Concepts & Information Technology	2	-	-	3	100	50	150
CE 107	Environmental Studies	2	-	-	3	50	50	100
ME 108	Engineering Graphics	-	-	6	3	100	50	150
ME 109	Workshop Practice-I	-	-	3	3	50	25	75
HS 110	Applied Physics Laboratory	-	-	3/2	3	50	25	75
HS 111	Engg. Chemistry Laboratory	-	-	3/2	3	50	25	75
CS 112	Computer Programming Laboratory	-	-	3	3	50	25	75
		16	2	16				1450

COMMUNICATIVE ENGLISH

Course Code: HS 101   Lectures: 3 periods/week   University Exam: 3 Hours
Class: I/IV B.Tech.   Sessional Marks: 50
Branch: All Branches   Univ. Exam Marks: 100

UNIT - I

1.   **GRAMMAR & VOCABULARY:**
      Noun: Number & Gender; Adjective: Formation of adjectives; Verb: Phrasal Verbs, tense, concord;
      Preposition: Simple preposition, phrasal preposition and their use; Conjunctions: Coordinating
      conjunctions, subordinating conjunctions and their use. Vocabulary: One word substitution, words
      often confused. Sentence structures.

                                                                              (18 periods)

UNIT – II

2.   **READING SKILLS:**
      Skimming, Scanning and note-making – Exposure to the following essay: "The American Scholar"
      Ralph Waldo Emerson.
      (Students will be drilled in the practice of reading followed by comprehension, note making, i.e.
      making notes from the essay so that they are able to recapitulate what they have read from the notes
      they make)

                                                                              (18 periods)

UNIT-III

3.   **WRITING SKILLS:**
      Paragraph writing;   Dialogue writing; Letter writing; Report writing; Project writing; Summary
      writing; Preparation of CV's

                                                                              (18 periods)

      (Students are trained in the art of writing by attaining cohesion and coherence)

UNIT – IV

4.   **(a) SPOKEN ENGLISH:**
      Social conversation; Formal Speech; Extempore Speech; Group Discussion; Facing interviews;
      Pronunciation practice.
      (b) LISTENING SKILLS:
      Listening to lectures, speech and taking down notes. Listening to T.V. programmes and cassettes and
      making notes.

                                                                              (18 periods)

TEXT BOOKS:
1. R.C.Sharma & Krishna Mohan, "Business Correspondence and Reports Writing".
2. Thomson and Martinet, "A Practical English Grammer", OUP, 4/e, 1989.
3. Dr. G.Damodar, "Errors in English Usage/ Detection of Errors", BIE., 1998.
4. Dr. M.Surender Kumar, Dr. G.Damodar & Dr. P.Ramadevi, "English for Engineers", 21C
   Publications, 2000.
5. Grand Tyalor, "Conversational English".

Details about question paper of University Examination
Time: 3 hours   Marks: 100
The Question Paper consists of Five questions of 20 marks each.
Question 1: About 10 short answer type questions from all the four units of the syllabus
Question 2: From Unit-I with internal choice
Question 3: From Unit-II with internal choice
Question 4: From Unit-III with internal choice
Question 5: From Unit-IV with internal choice

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MATHEMATICS - I

Course Code: HS 102   Lectures: 3 periods/week   University Exam: 3 Hours
Class: I/IV B.Tech.   Tutorials: 1 period/week   Sessional Marks: 50
Branch: All Branches   Univ. Exam Marks: 100

UNIT – I
(18+6 periods)

1. **INFINITE SERIES:**
Sequences, Series, Convergence, General properties, series of +ve terms, Comparison test, ratio test, root test, Integral test.

2. **DIFFERENTIAL CALCULUS:**
Rolle's theorem; Mean value theorems, expansions, asymptotes, tracing of simple curves, total differentiation, change of variables, jacobians, maxima and minima of functions of two variables, Lagrange's method of undetermined multipliers. Differentiation under integral sing.

UNIT – II
(18+6 periods)

3. **INTEGRAL CALCULUS:**
Multiple integrals – Double integrals – change of order of integration – double integration in polar co-ordinates – triple integrals – application to areas – volumes, centroids & moments of inertia – Beta, Gamma functions.

4. **COMPLEX VARIABLES:**
Functions of complex variables – limit, continuity and differentiability – analytic function: Cauchy – Riemann conditions – Harmonic function. Introduction to conformal transformation.

UNIT-III
(18+6 periods)

5. **ORDINARY DIFFERENTIAL EQUATIONS:**
Solution of first order and first degree differential equations; Homogeneous – Non-homogeneous equations, linear equations – Bernoulli's equations – exact equations integrating factors – orthogonal trajectories.

Linear equations of higher order with constant coefficients; complementary functions and particular integrals, Cauchy's homogeneous equation, method of variation of parameters.

UNIT-IV
(18+6 periods)

6. **VECTOR ANALYSIS:**

Scalar and Vector point functions – curves in space – Tangent – normal, bi-normal, curvature and torsion – Frenet – Serret Formulae – Gradient – Divergence and curl and their interpretation.

Integration of vector functions – line integral, work done, circulation – surface integrals – Green's theorem in plane – Stoke's theorem (without proof) – Volume integrals – Gauss divergence theorem (without proof) – Irrotational and solenoidal fields.

TEXT BOOKS:
1. Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers, Delhi.
2. Differential Calculus by Shanti Narayan, Chand & Co.

REFERENCE BOOKS:
1. Advanced Engineering Mathematics by R.K.Jain & SRK Iyengar, Narosa Pub.
2. Engineering Mathematics, Vol. I & II by Dr. S.S.Sastry, PHI.
3. Advanced Engineering Mathematics by E.Kreiszig.
4. Complex Variables and its applications by R.V.Churchill, McGraw Hill.
5. Vector Analysis by M.Spigal, Schaum Series.

APPLIED PHYSICS

Course Code: HS103
Class: I/V B.Tech.
Branch : All Branches

Lectures : 2 Periods/Week

University Exam : 3 Hours
Internal Assessment: 50 Marks
University Exam : 100 Marks

UNIT – I

1. OSCILLATIONS:

    Physical examples of simple harmonic motion – Torsional pendulum, physical pendulum, Spring – Mass systems and loaded beams – Two body oscillations – Free, Damped and forced oscillations – Resonance. (Qualitative).   (6 Periods).

2. INTERFERENCE:

    Principle of superposition – Young's experiment – coherence – Analytical treatment of interference – Superposition of more than two waves – Interference from thin films – phase change – Newton's rings – Michelson's interferometer and its application.
    (8 Periods).

UNIT – II

3. DIFFRACTION:

    Types of Diffraction – Fraunhofer Diffraction at a single slit – Fraunhofer Diffraction at a circular aperture – Rayleigh's criterion for resolution – double and multiple slit diffraction (Qualitative) – Diffraction grating – Resolving power of a grating   (6 Periods).

4. POLARIZATION:

    Polarizing sheets – polarization by reflection – Double Refraction – Nicol prism – Production and detection of plane, circularly and elliptically polarized light – quarter and half wave plates – optical activity – Laurent's half - shade polarimeter. Kerr Effect,Applications – LCD's.   (7 Periods).

UNIT – III

5. ULTRASONICS:

    Ultrasonic waves – production of ultrasonic waves – Magnetostriction method, Piezoelectric method – Detection, Properties, Wavelength – Acoustic grating and applications of ultrasonic waves.   (2 Periods)

6. MODERN PHYSICS:

    Energy distribution in black body radiation, Planck's law – photoelectric effect – photo electric, photo voltaic, photo conductive cells. De Broglie concept of matter waves – wave length, Schrödinger's wave equation - Time independent form (one dimensional), particle in a box (one dimensional) – Energy quantization wave functions.
                                    (7 Periods)

UNIT – IV

7. LASERS(Qualitative):

Interaction between radiation and matter – Absorption, Spontaneous and stimulated Emission – Contrast between conventional and Laser light – positive absorption and negative absorption – Population inversion – Optical resonator to aid amplification Types of lasers – Ruby laser, Helium – Neon Laser, Nd : YAG Laser, Carbon dioxide Laser, Semi conductor lasers – Applications of lasers – Formation and Reconstruction of Holograms.   **(7 Periods)**

8. FIBER OPTICS (Qualitative):

Basic principles – total internal reflection – Fiber Construction – Light Propagation through fibers – Types of Optical fibers (Step and graded index) – Signal distortion in optical fibers – Light wave communication using optical fibers – Applications of Optical fibers.   **(5 Periods)**

TEXT BOOKS :

1. David Halliday and Robert Resnick, **Physics part I,II** Wiley Eastern Limited.
2. R.K.Gaur and S.L.Gupta, **Engineering Physics**, Dhanpat Rai and Sons.
3. B.L. Theraja, **Modern Physics**. S.Chand & Co.,

REFERENCE BOOKS :

1. Wehr Richards and Adair, **Physics of the Atom**. Narosa Publication.
2. Dr.M.Armugam, **Physics for Engineers** (Chapter 9), Anuradha Agencies Educational Publishers.
3. Arther Beiser, **Concepts of Modern Physics**, Mc.Graw Hill Int.
4. Ajoy Ghatak, **Optics**, Tata McGraw Hill.
5. M.R.Srinivasan, **Physics for Engineers** (Chapter 7). New age International Pvt.Ltd.
6. M.N. Avadhanulu and G. Kshirsagar, **Engineering Physics**, S.Chand & Co.

ENGINEERING CHEMISTRY

Course Code: HS 104
Class: I/IV B.Tech.
Branch: All Branches

Lectures: 2 periods/week

University Exam: 3 Hours
Sessional Marks: 50
Univ. Exam Marks: 100

UNIT - I

1. **ELECTROCHEMISTRY:**
Specific and Equivalent Conductances. Effect of dilution on them – their experimental determination. Conductometric titrations. Electrode potential. Nernst equation. Electrochemical series. Reference Electrodes(Calomel electrode, Ag/AgCl electrode). Ion-selective electrode(glass electrode). Determination of pH using Glass, Quinhydrone and Hydrogen Electrodes. Potentiometric titrations. Electrochemistry of Zinc-Carbon Cell and Lead-Acid battery. **(12 periods)**

UNIT – II

2. **CORROSION:**
Introduction – Corrosion by pure chemical reaction. Electrochemical theory of corrosion. Galvanic corrosion. Differential aeration corrosion. Factors affecting corrosion. Prevention of corrosion (Cathodic protection, Hot Dipping, Cementation, Cladding, Electroplating, Anodizing, Corrosion inhibitors) **(5 periods)**

3. **SURFACE CHEMISTRY:**
Adsorption – Types of adsorption. Adsorption Isotherms (Freundlich, Langmuir adsorption isotherms). **(3 periods)**

4. **GASEOUS STATE:**
Critical State. Experimental and theoretical P-V isotherms. Critical state. Critical Constants. Relation between Critical Constants and vander Waals constants. Reduced Equation of State-Law of Corresponding states. **(3 periods)**

UNIT-III

5. **INTRODUCTION TO METHODS OF CHEMICAL ANALYSIS:**
Spectrum of Electromagnetic radiation. Introduction to spectroscopy. Microwave spectra: Theory. Application of microwave spectrum in the determination of bond lengths of diatomic molecules. Infra-Red spectra : Theory. Applications – Calculations of bond force constants and identification of functional groups in organic compounds. UV-Visible spectra: Types of electronic transitions. Lambert-Beer's Law and its application **(5 periods)**

6. **WATER ANALYSIS AND TREATMENT:**
Drinking water – Quality parameters – WHO Guidelines – BIS Guidelines. Hardness of Water. Determination of Hardness of water by using EDTA. Determination of Alkalinity and Chloride by titrimetry. Determination of Fluoride by spectrophotometry. Determination of Dissolved Oxygen, Biochemical Oxygen Demand and Chemical Oxygen Demand. Brief review of methods of softening of water (Zeolite process and Ion- exchange process). **(6 periods)**

UNIT – IV

7. **ORGANIC CHEMISTRY:**
Fission of Covalent bond. Types of reagents – Electrophilic, Nucleophilic and free radical reagents. Inductive effect. Resonance and Mesomeric effect. Brief study of the mechanisms of Elimination (E1

and E2 mechanisms), substitution (SN1 and SN2 mechansims) and Addition (Electrophilic, Nucleophilic and Free radical) reactions. Role of Inductive effect, Mesomeric effect, Hybridization and Steric effects on dissociation constants of Carboxylic Acids and Amines. **(10 periods)**

8.   **POLYMERS:**

Polymerization. Addition polymerization – Mechanisms and examples. Condensation Polymerization – Examples. Thermosetting and thermoplastic resins.

(4 periods)

TEXT BOOKS:

1.   Text book of Physical Chemistry (P.L. Soni and O.P. Dharmarha)
2.   Engineering Chemistry (Jain and Jain)
3.   Unified Course in Chemistry Vol. I (O.P. Agarwal)

REFERENCE BOOKS:

1.   Chemistry in Engineering & Technology (Kuriacose and Rajaram)
2.   General Chemistry (CNR Rao)
3.   Principles of Physical Chemistry (Maron and Prutton)
4.   A Text book of Engineering Chemistry (S.S.Dara)

Details about question paper of University Examination

Time: 3 hours   Marks: 100

The Question Paper consists of Five questions of 20 marks each.

Question 1: About 10 short answer type questions from all the four units of the syllabus

Question 2: From Unit-I with internal choice

Question 3: From Unit-II with internal choice

Question 4: From Unit-III with internal choice

Question 5: From Unit-IV with internal choice

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ENGINEERING MECHANICS

Course Code: CE 105
Class: I/IV B.Tech.
Branch: All Branches

Lectures: 3 periods/week

University Exam: 3 Hours
Sessional Marks: 50
Univ. Exam Marks: 100

UNIT – I

1. **INTRODUCTION:**
Basic Definitions – Mass, Particles, Rigid Body, Time, Space, Force, Branches of Mechanics, Fundamental principles of Mechanics – Parallelogram and Triangle laws of Forces, Newton's laws of Gravitation and Motion, Laws of superposition and Transmissibility of Forces.

(2 periods)

2. **FORCE SYSTEMS:**
Types of Forces – Co-planar, Concurrent and Parallel Forces, Moment and Couple, Free Body Diagaram, Types of Supports, Resultant of Force Systems, Resolution of Forces, Composition of Forces, Equilibrium equations of Forces, Lami's Theorem, Varignon's Theorem, Moment Equilibrium Equations, Distributed Forces, Resultant and Equilibrium of General Force System. (10+4 periods)

3. **PLANE TRUSSES AND FRAMES:**
Basic Definitions, Stability and Determinacy Conditions, Assumptions in Analysis of Trusses, Methods of Analysis of Trusses: Methods of Joints and Sections, Analysis of Frames by method of Members.

(6+2 periods)

UNIT – II

4. **FRICTION:**
Introduction, Laws of Friction, Cone of Friction, Simple contact friction problems, Application of Friction to Wedges, Square Screw Thread (Jack) and Belts

(5+2 periods)

5. **CENTROID, CENTRE OF GRAVITY & MOMENT OF INERTIA:**
Computation of Centroid, Centre of Gravity and Moment of Inertias of one dimensional, two dimensional and three dimensional figures, Pappus – Guldinus Theorems, Transfer Theorems of Moment of Inertia, Polar Moment of Inertia, Product of Inertia, Principal Axes, Mass Moment of Inertia.

(10+3 periods)

6. **VIRTUAL WORK:**
Work of Force and Moment, Principle of Virtual work and its applications.

(3+1 Periods)

UNIT-III

7. **PARTICLE DYNAMICS:**
Kinematics and Kinetics of Rectilinear and Curvilinear Translations, Equations of Dynamic Equilibrium – D'Alembert's Principle, Motion of particles acted upon by Constant Forces, Forces as function of time and displacement, Projectile motion, Motion of Vehicles on curved roads – Super elevation.

(13+4 periods)

Applications of work – Energy & Impulse – Momentum Principles of Rectilinear and Curvilinear motions, Direct Central Impact of Bodies: Elastic, Plastic and Semi-Elastic Impact (5+2 periods)

UNIT – IV

8. RIGID BODY DYNAMICS:
Rotation of a Rigid Body about a Fixed Axis: Kinematics of rotation, D'Alembert's Principle in Rotation, Resultant Inertia force in rotation, Work – Energy & Impulse – Momentum Principles applications.

(10+4 periods)

Plane Motion of Rigid Body – Kinematics, Instantaneous Centre, D'Alembert's Principle in Plane motion, Equations of Plane Motions, Principles of Angular Momentum and Energy Equations in plane motions.

(8+2 periods)

REFERENCE BOOKS:

1. Timoshenko and Young "Engineering Mechanics", McGraw Hill International Book Co., New York.
2. Singer F.L., "Engineering Mechanics, Statics and Dynamics", Harper and Row Publishers, New York.
3. Bhavikatti, SS and Rajashekarappa KG., "Engineering Mechanics", New Age Publications, New Delhi.
4. Tayal A.K., "Engineering Mechanics", Umesh Publications, Delhi.

CS 106 PROGRAMMING CONCEPTS AND INFORMATION TECHNOLOGY

Lectures: 2 per week
Univ. Exam: 100
Sessional: 50

Course: I Year B.Tech.
Branch: Common to all branches
University Exam: 3 Hours.

UNIT 1

Computer Basics: Block diagram representation of a simple computer and its functional description. Problem Solving and Programming style: Algorithms and programs, flow-charts and structural programming style.
Introduction to Programming: Data types, declarations, arithmetic operations, relational and logical operations, type conversions, increments and decrement operations, bit wise operations, conditional expressions and order of evaluation. Basic Input and output and formatted input and output statements. Statements and blocks, If-else, nested-Id and switch statements. (12)

UNIT-2

Repetition Control Structure: While do while and for loops, break and continue statements, go to and labels and exit. **Arrays:** Array declaration, Syntax rules for arrays, Multidimensional arrays and strings and stray processing and string functions. **Functions**: Defining functions, scope rules global and local variables, arrays in function parameter passing mechanisms, recursion. (12)

UNIT 3

Pointers: defining pointers, pointers and arrays, dynamic memory allocations, pointers and functions. **Structures and Unions**: Defining structures and unions. Structure and functional, array of structuring, pointers to structures, structure in structures: **Files**: Defining files, file handling functions, teat files, and binary files, defining macros, conditional compilations. (12)

UNIT 4

Computer Fundamentals: Binary numbers, bits, bytes and binary codes, Buses, Input output devices, Memory, Primary and Secondary storage. Software, Hardware, Application Programs, **Operating System:** DOS, WINDOWS, UNIX. File management utilities, program testing, verification, debugging and documentation.

Computer Networks: Network applications, Types of Networks, LAN, WAN, Internet, Modems, World wide webs, Getting connected to WEB, Browsing, Locating information, Multimedia, Web multimedia. (12)

Text Books:
1. "C Programming Language"- Brain W.Kerningham, Dennis,M. Ritche, Prentice Hall of India, second edition, 1992
2. "Programming in C",E. Balaguruswamy, Tata Mc-Graw Hill, second edition,1992
3. "Information Technology: The Breaking wave",Dennis. P. Curtin, Mc-Graw Hill Edition, 1999

Reference Books:
1. "An Introduction to Programming with PASCAL", G.Macheel Schenieder, Steven W. Weingart and David M. Perlman, John Wiley&Sons,1996
2. "Introduction to Computers", P. Radha Krishna, Hi-Tech Publications,2000
3. "Introduction to Information Technology", Efrain Turban, R. Kelly Rainer Jr. and Richard E. Porter, John Wiley&Sons,2000

ENVIRONMENTAL STUDIES

(In pursuance with the directives of Hon'ble Supreme Court of India)

Instructions: 2 periods / week   Internal Exam: 50 Marks.   External Exam: 50 Marks.

Unit 1 INTRODUCTION   (2)

The multidisciplinary nature of environmental studies: Definition, scope and importance

Unit 2 NATURAL RESOURCES   (10)

a) Forest Resources:
Use and over-exploitation of forests, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people.

b) Water Resources:
Use and over-utilization of surface and ground water, floods; drought; conflicts over water; dams; benefits and problems.

c) Mineral Resources:
Use and exploitation, environmental effects of extracting and using mineral resources.

d) Agricultural Land and Food Resources:
Land as a resource; land degradation; main induced landslides, soil erosion and desertification, World food problems, changes causes by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

e) Energy Resources:
Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies.

Unit 3 ECOSYSTEM AND BIODIVERSITY   (10)

a) Ecosystem:
Concepts of an ecosystem; Structure and function of forests, grassland, desert and aquatic ecosystems, Food chain, food webs and ecological pyramids; Energy flow in the ecosystem; Producers, consumers and decomposers, ecological succession.

b) Biodiversity and its conservation:
Introduction – definition, genetic, species and ecosystem diversity; value of biodiversity; Consumptive use, productive use; Social, ehtical aesthetic and option values.

Biodiversity at global, National and local levels, Biodiversity in India, Hot spots of biodiversity, Threats to biodiversity, Habitat loss, Man-whildlife conflicts, Endangered and endemic species of India, In-situ and Ex-situ conservation of biodiversity.

Unit 4 ENVIRONMENTAL POLLUTION & CONTROL MEASURES (10)

a) Environmental Pollution:
Global climatic change, Green house gases, Acid rain.

Causes and effects of Air, Water, Soil, Marine and Noise pollution with case studies.

Solid and Hazardous Waste Management: Sources and types of Solid wastes; Effects of urban, industrial wastes and nuclear waste.

b) Control Measures:
Control measures for Air, Water and Noise pollution, Solid waste management, Natural disaster management: Flood, earthquake, cyclone and landslide.

Unit 5 ENVIRONMENT PROTECTION AND SOCIETY (10)

a) Role of Individual and Society:
Role of individual in prevention of pollution, Consumerism and waste products, unsustainable Vs sustainable development, Water conservation, Rain water harvesting, Watershed management, Wasteland reclamation.

b) Environmental Protection / Control Acts:
Environmental legislation with respect to Air, Water, Forest and Wildlife, Observance and popularization of Environmental Protection Acts, Enforcement of environmental legislations, Population growth, Environment and Human health, Role of Information Technology in Environment and Human Health.

TEXT BOOKS:

1. Gilbert M.Masters, Introduction to Environmental Engineering & Science, 1991, Prentice Hall.

2. Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co.

3. Anjaneyulu Y., Environmental Studies, B.S. Publications.

4. Chandrasekhar M., Environmental Science, Hitech Publishers.

REFERENCES:

1. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt., Ltd.

2. Odum, E.P. 1971, Fundamentals of Ecology, W.B. Saunders Co., USA, 574p.

3. Trivedi R.K. and P.K. Goel, Introduction to Air Pollution, Technoscience Publications.

ENGINEERING GRAPHICS

Course Code: ME 108   Practicals: 6 periods/week   University Exam: 3 Hours
Class: I/IV B.Tech.   Sessional Marks: 50
Branch: All Branches   Univ. Exam Marks: 100

UNIT - I

1. Littering, ISI specifications for dimensioning, captions, division of lines and angles, conventions and symbols used in various branches of engineering. (9)
2. Construction of polygons, construction of conic curves, cycloid and involute. (12)
3. Scales: R.F., Plain, diagonal and vernier scales. (9)

UNIT – II

4. Projections of points. (3)
5. Projections of Lines: Lines inclined to one reference plane, lines inclined to both reference planes, traces. . (18)
6. Projections of planes. (9)

UNIT-III

7. Projections of solids: Prisms, Cylinders, Pyramids and Cones inclined to both reference planes. Projections of solids by auxiliary plane method. (15)
8. Sections of solids: Section Planes, sectional views and true shape of sections. (9)
9. Intersections of solids: cylinder in cylinder, prism in prism, cylinder in prism, cylinder in cone. (12)

UNIT – IV

10. Development of surfaces: prisms, cylinders, pyramids and cones. (6)
11. Conversion of pictorial views into orthographic views. Sectional views. (9)
12. Isometric projections: isometric scale, isometric projections, isometric views, conversion of orthographic views into isometric projections. (12)
13. Introduction to Computer Aided Drafting: Generation of simple figures using point, line, circle, etc., commands. (6)

TEXT BOOKS:
  1. Bhatt N.D., "Elementary Engineering Drawing", Charotar Publishing House, Anand.

REFERENCE BOOKS:
  1. K.L.Narayana & P.Kannaiah, "Engineering Drawing", Scitech Publications, Chennai.
  2. Venugopal K., "Engineering Graphics with Auto CAD", New Age International Publishers Ltd., Hyderabad.
  3. Grabowski, "Learn Auto CAD in a day", BPB Publishers.

WORKSHOP PRACTICE

Course Code: ME 109
Class: I/IV B.Tech.
Branch: All Branches

Practicals: 3 periods/week

University Exam: 3 Hours
Sessional Marks: 25
Univ. Exam Marks: 50

1. **CARPENTARY:** Half-lap dove-tail joint, mortise and tenon joint, bridle joint.

2. **FITTING:** Square fit, half round fit, dovetail fit.

3. **WELDING:** Lap Joint, Single V-Butt Joint, T-Joint, L-Joint.

4. **HOUSE WIRING:** Series wiring and parallel wiring by one way switch, two way switching for stair case light, Tube light connections.

5. **PLUMBING:** Preparation of nipple and fitting to Elbow, Tee, Union and Coupling.

TEXT BOOK:

1. Venkat Reddy. K. " First Year Workshop Practicals". Vipaka Publishers.

APPLIED PHYSICS LABORATORY

Course Code:HS 110
Class: I/IV B.Tech.
Branch: All Branches

Practicals: 3 periods/2 weeks

University Exam: 2 Hours
Sessional Marks: 25
Univ. Exam Marks: 50

LIST OF EXPERIMENTS:

1. Compound pendulum – Determination of acceleration due to gravity.
2. Torsional pendulum – Determination of rigidity modulus of the given wire.
3. Spiral spring – Determination of the restoring force per unit extension of the spring.
4. Carey Foster's Bridge – Determination of resistivity.
5. Calibration of an Ammeter/Voltmeter using potentiometer.
6. To determine the internal resistance of a cell using potentiometer.
7. Determination of magnetic moment of a magnet (M) and Horizontal component of Earth's Magentic field (H) using deflection and vibration magnetometers.
8. Newton's rings – Determination of wavelength of monochromatic light.
9. Determination of diameter of a wire by wedge method.
10. Spectrometer – Dispersive power of a prism.
11. Determination of wavelength of He-Ne laser light.
12. Diffraction grating – Determination of wavelength by normal incidence method.
13. Determination of slit width using He-Ne laser.
14. Resolving power of a telescope.
15. Polarimeter – Determination of specific rotation of cane sugar.
16. Measurement of Photoelectric Current and Determination of work function of a photoelectric material.
17. Determination of half-life of a radio active source using G.M. Counter.
18. Measurement of numerical aperture in optical fibers.

ENGINEERING CHEMISTRY LABORATORY

Course Code: HS 111   Lectures: 3 periods/2weeks   University Exam: 3 Hours
Class: I/IV B.Tech.   Sessional Marks: 25
Branch: All Branches   Univ. Exam Marks: 50

LIST OF EXPERIMENTS

1. Determination of Alkalinity of water

2. Determination of Hardness of water using EDTA

3. Determination of Dissolved Oxygen in a sample of water

4. Colorimetric analysis – Application of Lambert-Beer's Law

5. Estimation of Manganese in steel by Colorimetry

6. Estimation of Fluoride ions in water

7. Conductometric Titrations

8. Potentiometric Titrations

9. Estimation of Exhaust Gases by Orsat Apparatus

10. Estimation of Iron in iron ore

11. Estimation of Manganese in Pyrolusite by Permanganometry

12. Estimation of Copper in brass by Iodometry

13. Estimation of Available Chlorine in Bleaching powder

14. Verification of Adsorption Isotherm

15. Synthesis of a Polymer

16. Blue Printing

17. Estimation of Metal- ion using Ion-exchange resin

18. Determination of Calcium in Lime Stone / Dolomite

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CS112 COMPUTER PROGRAMMING LABORATORY

Practicals: 3 periods/Week   University exam: 3 Hours
Class: I/IV B.Tech.   Internal Assessment: 25 Marks
Branch: Common to All Branches   University Examination: 50 Marks

C-LANGUAGE PROGRAMS:

1. Simple Programmes using arithmetic, Logical & Relational operators and by using Built-in-functions like SQRT(),CHAR(), etc.
2. Programs using Conditional Statements & Nested control statements like, IF,IF...ELSE,IF..ELSE..IF, etc. and by using unconditional control statements like Switch and "?".
3. Programs using control structures & Iterative Statements like TOP-TESTED (While), BOTTOM-TESTED (Do...while) & FOR – Loops.
4. Programs for solving problems like Armstrong Number, Prime Numbers, Factorial of a number, Palindrome and sum of Natural Numbers etc.
5. Programs using one-dimensional arrays like reading a list of data, finding sum, average, arranging them ascending or descending orders etc.
6. Simple programs using two –dimensional arrays like for reading a list of student names, Matrices, Arranging the names in Ascending orders etc.
7. Simple programs using functions like for reading the Matrix, Printing the Matrix, calculating Addition, Multiplication & Finding Transpose of the Matrix etc.
8. Programs using Recursive Technique like finding the factorials and Fibonacci series etc.
9. Programs using Cal by-Reference for Swap the Data, Find a given number among a set of numbers, Arranging the Data in specific order, etc.
10. Simple programs using Pointers implementing one-dimensional array using pointers, two-dimensional arrays using Pointer-to-Pointer.
11. Programs using pointers for dynamic memory allocation for one-dimensional and multidimensional arrays and pointers to functions.
12. * Programs using C-Graphics like Drawing a line, Circle Drawing, Rectangle Drawing and using different point plotting and line drawing techniques.
13. Programs using simple structures like Student Record (Name, Roll No., Marks 1,2,3...) and finding the Average, Total, Grade of the student and Employee Records etc.
14. Programs using array of structures to read a list of student, employee records and calculating the over all result/calculations etc.
15. Programs using Structures and Unions.
16. Simple programs using pre-processor directives like defining constants, Macros, conditional compilations and including other file fractions.

(*) This experiment is to be executed compulsorily.