ANNA UNIVERSITY OF TECHNOLOGY MADURAI
MADURAI

CURRICULUM AND SYLLABI
UNDER REGULATIONS 2010-2011 FOR ALL AFFILIATED INSTITUTIONS

(Common to all B.E. / B.Tech. Degree Programme except B.E. – Marine Engineering)
SEMESTER II

Subject Code	COURSE TITLE	L	T	P	C
10ATE02	Technical English –II*	3	1	0	4
10AMA02	Mathematics –II*	3	1	0	4
10APH02	Engineering Physics –II*	3	0	0	3
10ACH02	Engineering Chemistry – II*	3	0	0	3
10AEM02	Engineering Mechanics (For non – Circuit branches)	3	1	0	4
10ACT02	Circuit Theory (For branches under Electrical Faculty)	3	1	0	4
10AED02	Electric Circuits and Electron Devices (For branches under I & C Faculty)	3	1	0	4
10AEE02	Basic Electrical & Electronics Engineering (For non – Circuit branches)	4	0	0	4
10ACM02	Basic Civil & Mechanical Engineering (For circuits branches)	4	0	0	4
10APCL02	Physics. Laboratory & Chemistry Laboratory*	0	0	2	2
10ACPL02	Computer Practice Laboratory*	0	0	3	2
10ACML02	Computer Aided Drafting and Modeling Laboratory (For non-circuits branches)	0	1	2	2
10AECL02	Electrical Circuits Laboratory (For branches under Electrical Faculty)				2
10ACDL02	Circuits and Devices Laboratory (For branches under I & C Faculty)				2
					28

*Common to all BE/B.Tech Programs

LIST OF BRANCHES UNDER VARIOUS FACULTIES

NON-CIRCUIT BRANCHES

I **Faculty of Civil Engineering**

1. B.E. Civil Engineering

II **Faculty of Mechanical Engineering**

1. B.E. Aeronautical Engineering
2. B.E. Automobile Engineering
3. B.E. Mechanical Engineering
4. B.E. Production Engineering
5. B.E. Mechatronics Engineering
6. B.E. Marine Engineering

III **Faculty of Technology**

1. B.Tech. Chemical Engineering
2. B.Tech. Biotechnology
3. B.Tech. Textile Technology
4. B.Tech. Textile Technology (Fashion Technology)

CIRCUIT BRANCHES

I **Faculty of Electrical Engineering**

1. B.E. Electrical and Electronics Engineering
2. B.E. Electronics and Instrumentation Engineering
3. B.E. Instrumentation and Control Engineering

II **Faculty of Information and Communication Engineering**

1. B.E. Computer Science and Engineering
2. B.E. Electronics and Communication Engineering
3. B.Tech. Information Technology

A. CIRCUIT BRANCHES

I **Faculty of Electrical Engineering**

1. B.E. Electrical and Electronics Engineering
2. B.E. Electronics and Instrumentation Engineering
3. B.E. Instrumentation and Control Engineering

II **Faculty of Information and Communication Engineering**

1. B.E. Computer Science and Engineering
2. B.E. Electronics and Communication Engineering
3. B.Tech. Information Technology

B. NON- CIRCUIT BRANCHES

I **Faculty of Civil Engineering**

1. B.E. Civil Engineering

II **Faculty of Mechanical Engineering**

1. B.E. Aeronautical Engineering
2. B.E. Automobile Engineering
3. B.E. Mechanical Engineering
4. B.E. Production Engineering
5. B.E. Mechatronics Engineering
6. B.E. Marine Engineering

III **Faculty of Technology**

1. B.Tech. Chemical Engineering
2. B.Tech. Biotechnology
3. B.Tech. Textile Technology
4. B.Tech. Textile Technology (Fashion Technology)
5. B.Tech. Textile Chemistry

1) 10ATE02 **TECHNICAL ENGLISH II** **L T P C**
3 1 0 4

AIM:

To encourage students to actively involve in participative learning of English and to help them acquire Communication Skills.

OBJECTIVES:

1. To help students develop listening skills for academic and professional purposes.
2. To help students acquire the ability to speak effectively in English in real-life situations.
3. To inculcate reading habit and to develop effective reading skills.
4. To help students improve their active and passive vocabulary.
5. To familiarize students with different rhetorical functions of scientific English.
6. To enable students write letters and reports effectively in formal and business situations.

UNIT I LANGUAGE FOCUS

Technical vocabulary – Synonyms and Antonyms- Numerical Adjectives – Conjunction-Preposition- clauses – noun & Adjective clauses – SI Units – Abbreviation & acronyms – homonyms-Phrasal verbs & idioms

13

UNIT II LANGUAGE FOCUS

Relative clauses – Imperative – Infinitive structures – Question Pattern – Wh- Aux-Verbs
(Yes/No Questions) Contrasted time structures – Adverbial clauses of time, place and manner – intensifiers – Basic pattern of sentences.

13

UNIT III READING

Intensive Reading – Predicting content – Interpretation – inference from the text (implication) – Inferential information – implication – critical interpretation – reading brief notices, advertisement and the implication-

13

UNIT IV WRITING

Paragraph /Essay writing – preparation of proposal - Taking down minutes of the meeting – creative and critical thinking expressed –Descriptive and persuasive writing – preparation of a report – Technical reports.

13

Unit V (Not for Examination)

Listening to Lectures/ Seminar/Workshop –

1. Write a brief summary of the listened matter
2. British council recording

Speaking

1. Oral presentation on any topic (5 Minutes)
2. Group discussion
3. Accepting other's views /ideas
4. Arguing against the others views
5. Interrupting others' when they speak (techniques/)
6. Pronunciation /stress/intonation-
7. Addressing the higher officials, colleagues, subordinates – on any issue **8**

TEXT BOOKS :

1. "English For Engineers and Technologists", (Dept. of Humanities and Social Sciences Anna University, Chennai: Vol I & II combined edition) Orient Longmans Reprint 2008.

2. "Perform In English", Dr. M. Balasubramanian & Dr. G. Anbalagan: Anuradha Pub, Kumbakonam Rev Ed: 2008, Reprint 2010.

REFERENCES:

1. "A Course in Communication Skills", P. Kiranmai Dutt and others: 2007 Edition Foundation books: Cambridge House, 4381/4 Ansari Road, Daryanganj, New Delhi – 2.

2. "Effective Technical Communication", M. Ashraf Rizvi: Tata Mcgraw Hill, Reprint 2007.

2) 10AMA02 MATHEMATICS – II

L	T	P	C
3	1	0	4

UNIT I LAPLACE TRANSFORM

Transform of elementary functions – Basic properties – Transforms of derivatives and integrals – Initial and final value theorems – Inverse Laplace transform - Convolution theorem - Solution of ODE with constant coefficients using Laplace transform - Transform of periodic functions – Solution of Integral equations.

12

UNIT II VECTOR CALCULUS

Gradient, Divergence and Curl – Directional derivative – Irrotational and solenoidal vector fields – Vector integration – Problem solving using Green's theorem, Gauss divergence theorem and Stokes' theorem – Simple applications and verifications.

12

UNIT III ANALYTIC FUNCTIONS

Necessary and Sufficient conditions (without proof) - Cauchy –Riemann equations – Properties of analytic functions - Harmonic conjugate – Construction of analytic functions – Conformal mapping: $w = z+ a$, az, $1/z$, z^2 and bilinear transformation.

12

UNIT IV MULTIPLE INTEGRALS

Double integration – Cartesian and Polar Co-ordinates – Change of order of integration – Area as a double integral – Change of variables between Cartesian and Polar Co-ordinates –Triple integration –Volume as triple integral.

12

UNIT V COMPLEX INTEGRATION

Problems solving using Cauchy's integral theorem and integral formula – Taylor's and Laurent's expansions – Residues – Cauchy's Residue theorem – Contour integration over unit circle – semi-circular contours with no pole on real axis.

12

TEXT BOOKS:

1. “Higher Engineering Mathematics”, Grewal, B.S., Thirty eighth Edition, Khanna Publishers, New Delhi, 2005.

2. “Engineering Mathematics”, Venkataraman.M.K., Volume I and II Revised enlarged Fourth Edition, The National Publishing Company, Chennai, 2004.

REFERENCES:

1. “Text book of Engineering Mathematics”, Bali.N.P and Manish Goyal, Third edition Laxmi Publications (P) Ltd., 2008.

2. “Adnaced Engineering Mathematics”, Jain R.K and Iyengar S.R.K, Third Edition, Narosa Publishing House Pvt. Ltd., (2007).

3. “Engineering Mathematics (for first year)”, Veerarajan. T., Fourth Edition, Tata McGraw – Hill Publishing Company Limited, New Delhi, 2005.

3) 10APH02 ENGINEERING PHYSICS – II

L	T	P	C
3	0	0	3

UNIT I CONDUCTING MATERIALS

Conductors – classical free electron theory of metals – Electrical and thermal conductivity – Wiedemann – Franz law – Lorentz number – Draw backs of classical theory – Quantum theory – Fermi-Dirac distribution function – Effect of temperature on Fermi Function – Density of states – carrier concentration in metals.

9

UNIT II SEMICONDUCTING MATERIALS

Intrinsic semiconductor – carrier concentration derivation – Fermi level – Variation of Fermi level with temperature – electrical conductivity – Band gap determination – Extrinsic semiconductors – carrier concentration in n-type and p-type semiconductors – variation of Fermi level with temperature and impurity concentration – compound semiconductors – Hall effect –Determination of Hall coefficient – Applications.

9

UNIT III MAGNETIC AND SUPERCONDUCTING MATERIALS

Origin of magnetic moment – Dia , Para and Ferro magnetic materials – Domain theory – Hysteresis – soft and hard magnetic materials – Ferrites – applications – magnetic recording – storage of magnetic data – tapes, floppy discs

Superconductivity: Superconductors - Types of super conductors – High Tc superconductors – Applications of superconductors – Josephson effect - SQUID, cryotron. **9**

UNIT IV DIELECTRIC MATERIALS

Dielectric constant – polarization in dielectrics – Different types of polarization (Derivation for polarizability) - Clausius – Mosotti equation – dielectric loss – dielectric breakdown – Applications – Ferro electricity and applications.

9

UNIT V MODERN ENGINEERING MATERIALS

Metallic glasses- preparation, properties and applications-Shape memory alloys (SMA) - Characteristics - applications, Advantages and Disadvantages of SMA.

Nanomaterials -synthesis –plasma arcing – pulsed laser deposition - chemical vapour deposition – ball milling – electro deposition – applications.

Carbon nanotubes: structure – properties - applications.

9

TEXT BOOKS:

1. “Introduction to Solid State Physics”, Charles Kittel John Wiley & sons,7th edition, Singapore (2007).
2. “Introduction to Nanotechnology”,Charles P. Poole and Frank J.Ownen,Wiley India(2007) (for Unit V)

REFERENCES:

1. “Materials science”, Rajendran, V, and Marikani A, Tata McGraw Hill publications,(2004) New Delhi.
2. “Materials science”, Jayakumar, S. R.K. Publishers, Coimbatore, (2008).
3. “Materials science”, Palanisamy P.K, Scitech publications(India) Pvt. LTd., Chennai, second edition(2007)
4. “Materials science”, M. Arumugam, Anuradha publications, Kumbakonam,(2006).

4) 10ACH02 ENGINEERING CHEMISTRY – II

L	T	P	C
3	0	0	3

UNIT I ELECTROCHEMISTRY

Electrochemical cells – reversible and irreversible cells – EMF – measurement of EMF– electrode potential – Nernst equation (problems) – reference electrodes – Standard Hydrogen electrode -Calomel electrode – Ion selective electrode - glass electrode and measurement of pH – electrochemical series – significance – potentiomettic titrations (redox - Fe^{2+} vs dichromate and precipitation – Ag^{+} vs. CI^{-}) and conductometric titration (acid-base – HCI vs. NaOH). **9**

UNIT II CORROSION AND CORROSION CONTROL

Chemical corrosion – Pilling – Bedworth rule – electrochemical corrosion – types – galvanic corrosion – differential aeration corrosion – factors influencing corrosion – corrosion control – sacrificial anode and impressed cathode current methods – corrosion inhibitors – protective coatings – paints – constituents and functions – metallic coatings – Hot dipping(Zn)-electroplating (Au) and electrolysis Plating (Ni). **9**

UNIT III FUELS AND COMBUSTION

Fuels-Types-Calorific value – Coal – proximate and ultimate analysis-metallurgical coke – manufacture by Otto-Hoffmann method – Petroleum refining– cracking – catalytic cracking methods-knocking – octane number and cetane number – synthetic petrol – Fischer Tropsch and Bergius processes – Gaseous fuels- water gas, producer gas, CNG and LPG. Flue gas analysis – Orsat method – theoretical air for combustion (problems). **9**

UNIT IV PHASE RULE AND ALLOYS

Statement and explanation of terms involved – one component system – water system – condensed phase rule – construction of phase diagram by thermal analysis – simple eutectic systems (lead-silver system only) – alloys – importance of ferrous alloys – nichrome and stainless steel – heat treatment of steel, non-ferrous alloys – brass and bronze. **9**

UNIT VANALYTICAL TECHNIQUES

Beer-Lambert's law (problems) – UV-visible spectroscopy and IR spectroscopy – principles – instrumentation (problem & block diagram only) – estimation of sodium by flame photometry - atomic absorption spectroscopy- principle – instrumentation (block diagram only) -estimation of nickel by AAS.

9

TEXT BOOKS:

1. "Engineering Chemistry" , P.C.Jain and Monica Jain, Dhanpat Rai Pub, Co., New Delhi (2002).

2. "A text book of Engineering Chemistry", S.S.Dara S.Chand & Co.Ltd., New Delhi (2006).

REFERENCES:

1. "Engineering Chemistry" , B.Sivasankar , Tata McGraw-Hill Pub.Co.Ltd, New Delhi (2008).

2. "Engineering Chemistry", B.K.Sharma Krishna, Prakasan Media (P) Ltd., Meerut (2001).

5) 10AEM02 **ENGINEERING MECHANICS**

(For non-circuit branches)

L	T	P	C
3	1	0	4

UNIT I BASICS & STATICS OF PARTICLES

Introduction – Units and Dimensions – Laws of Mechanics – Lame's theorem, Parallelogram and triangular Law of forces – Vectors – Vectorial representation of forces and moments – Vector operations: additions, subtraction, dot product, cross product – Coplanar Forces – Resolution and Composition of forces – Equilibrium of a particle – Forces in space – Equilibrium of a particle in space – Equivalent systems of forces – Principle of transmissibility – Single equivalent force. **12**

UNIT II EQUILIBRIUM OF RIGID BODIES

Free body diagram – Types of supports and their reactions – requirements of stable equilibrium – Moments and Couples – Moment of a force about a point and about an axis – Vectorial representation of moments and couples – Scalar components of a moment – Varignon's theorem – Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions – Examples.

12

UNIT III PROPERTIES OF SURFACES AND SOLIDS

Determination of Areas and Volumes – First moment of area and the centroid of sections- Rectangle, circle, triangle from integration – T section, I section, - Angle section, Hollow section by using standard formula – second and product moments of plane area – Parallel axis theorem and perpendicular axis theorem – Polar moment of inertia – Principle moments of inertia of plane areas – Principle axes of inertia – Mass moments of inertia – Derivation of mass moment of inertia for rectangular section prism, sphere from first principle – relation to area moments of inertia.

12

UNIT IV DYNAMICS OF PARTICLES

Displacements, Velocity and acceleration, their relationship – relative motion – Curvilinear motion – Newton's law – Work Energy Equation of particles – Impulse and Momentum – Impact of elastic bodies.

12

UNIT V FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS

Frictional force – Laws of Coulomb's friction – Simple contact friction – rolling resistance Belt friction.
Translation and rotation of rigid bodies – Velocity and acceleration – General Plane motion. **12**

TEXT BOOK:

1. "Vector Mechanics for Engineers", Beer, F.P and Johnson Jr. E.R. Vol. 1 Statics and Vol. 2 Dynamics, McGraw-Hill International Edition, (1997).

REFERENCES:

1. "Fundamentals of Engineering Mechanics", Rajasekaran, S, Sankarasubramanian, G., Vikas Publishing House Pvt. Ltd., (2000).

2. "Engineering Mechanics", Hibbeller, R.C., Vol. 1 Statics, Vol. 2 Dynamics, Pearson Education Asia Pvt. Ltd., (2000).

3. "Engineering Mechanics – Statics & Dynamics", Palanichamy, M.S., Nagam, S., Tata McGraw-Hill, (2001).

4. "Engineering Mechanics – Statics and Dynamics", Irving H. Shames, IV Edition – Pearson Education Asia Pvt. Ltd., (2003).

5. "Interactive Engineering Mechanics – Statics – A Virtual Tutor (CDROM)", Ashok Gupta, Pearson Education Asia Pvt., Ltd., (2002).

5) 10ACT02 **CIRCUIT THEORY**

(For Branches under Electrical Faculty)

L	T	P	C
3	1	0	4

UNIT I BASIC CIRCUIT ANALYSIS

Ohm's law, Kirchoff's laws – DC and AC circuits – Resistors in series and parallel circuits – Mesh current and node voltage method of analysis for DC and AC circuits (AC circuits at elementary level only) **12**

UNIT II NETWORK REDUCTION AND NETWORK THEOREMS FOR DC AND AC CIRCUITS

Network reduction: Voltage and current division, Source Transformation – Star, delta conversion – Thevenin's Theorem and Norton's Theorem- Superposition Theorem – Maximum power transfer Theorem. **12**

UNIT III RESONANCE AND COUPLED CIRCUITS

Series and Parallel resonance – their frequency response – Quality factor and Bandwidth – Self and Mutual inductance – Co-efficient of coupling – Tuned circuits – single Tuned circuits and double Tuned circuits. **12**

UNIT IV TRANSIENT RESPONSE OF DC AND AC CIRCUITS.

Transient response of RL, RC, and RLC circuits using Laplace Transform for DC input and AC sinusoidal inputs only. **12**

UNIT VANALYSIS OF THREE PHASE CIRCUITS

Three phase balanced and unbalanced voltage sources – analysis of three phase 3 wire and 4 wire circuits with star and delta connected loads, balanced and unbalanced phasor diagram of voltages and currents – power and power factor measurements in three phase circuits. **12**

TEXT BOOKS:

1. "Electric Circuit Analysis", Sudhakar.A and Shyam Mohan.SP, 2nd Edition, 2009, Tata Mc-Graw Hill Publications, New Delhi.

2. "Engineering Circuit Analysis", Gnanavadivel.J, Senthilkumar.C and Maruthupandi.P, 2nd Edition, 2010, Anuradha Publications, Kumbakonam.

REFERENCES:

1. "Engineering Circuit Analysis", W.H.Hayt & J.K.Kemmerly and Steven M.Durbin, 7th Edition, 2007, Tata Mc-Graw Hill Publications, New Delhi.

2. "Circuit Theory", A.Chakabarthi, 5th Edition, 2006, Dhanpatrai & Co, New Delhi.

5) 10AED02 **ELECTRIC CIRCUITS AND ELECTRON DEVICES**

(For Branches under I & C Faculty)

L	T	P	C
3	1	0	4

UNIT I CIRCUIT ANALYSIS TECHNIQUES

Kirchoff's Current and Voltage Laws – Series and Parallel connection of independent sources – R, L and C – Network, Theorems, Thevenin, Supersposition, Norton, Maximum Power Transfer and Duality, Star - Delta conversion (Simple Problems) **12**

UNIT II TRANSIENT RESPONSE AND RESONANCE IN RLC CIRCUITS

Basic RL, RC, and RLC Circuits and their response to sinusoidal inputs – Frequency Response – Parallel and Series resonances - Q factor – BW – Single and Double Tuned circuits. **12**

UNIT III SEMICONDUCTOR DIODES

Intrinsic and Extrinsic semiconductors – Theory of PN junction diode – Energy band structure – current equation (Basic equation) space charge and diffusion capacitance – Effect of Temperature and breakdown mechanism – Zener diode and its characteristics. **12**

UNIT IV TRANSISTORS

Principle of operation of PNP and NPN Transistors – CE, CB, CC configuration – and comparison of their characteristics – Biasing – Break down in Transistors – Operation and comparison of N channel and P channel JFET drain characteristic equation. MOSFET – Enhancement and Depletion Types – structure and operation – Comparison of BJT with MOSFET – thermal effect on MOSFET.

12

UNIT V SPECIAL SEMICONDUCTOR DEVICES (QUALITATIVE TREATEMENT ONLY)

Tunnel diodes – PIN Diode – Varactor diodes – SCR characteristics and Two Transistor equivalent model – UJT – Diac and Triac – Laser, CCD, Photodiode, Photo transistor, Photo conductive and Photo Voltaic cells – LED, LCD.

12

TEXT BOOKS:

1. "Electric Circuits" , Joseph A. Edminister, Mahmood, Nahri,– Shaum series, Tata McGraw Hill, (2001).

2. "Electronic Devices and Circuits", S. Salivahanan, N. Suresh kumar and A. Vallavanraj, Tata McGraw Hill, 2nd Edition, (2008).

3. "Electronic Devices and Circuits", David A. Bell, Oxford University Press, 5th Edition, (2008).

REFERENCES:

1. “Introducing Electronics Devices and Circuits”, Robert T. Paynter, Pearson Education, 7th Education, (2006).

2. “Engineering Circuit Analysis”,William H. Hayt, J.V. Jack, E. Kemmebly and steven M. Durbin, Tata McGraw Hill, 6th Edition, 2002.

3. “Electronic Devices & Circuits”, J. Millman & Halkins, Satyebranta Jit, Tata McGraw Hill, 2nd Edition, 2008.

6) 10AEE02 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to branches under Civil, Mechanical and Technology Faculties)

L	T	P	C
4	0	0	4

UNIT I ELECTRICAL CIRCUITS AND MEASURMENTS

Ohm's Law – Kirchoff's Laws – Steady State Solution of DC Circuits – Introduction to AC Circuits – Waveforms and RMS Value - Power and Power factor - Single Phase and Three Phase Balanced Circuits.

Operating Principles of Moving Coil and Moving Iron Instruments (Ammeters and Voltmeters). Dynamometer type Watt meters and Energy meters.

12

UNIT II ELECTRICAL MACHINES

Construction, Principle of Operation, Basic Equations and Applications of DC Generators, DC Motors, Single Phase Transformer, Single Phase Induction Motor.

12

UNIT III SEMICONDUCTOR DEVICES AND APPLICATIONS

Characteristics of PN Junction Diode – Zener Effect - Zener Diode and its Characteristics - Half wave and Full wave Rectifiers – Voltage Regulation.

Bipolar Junction Transistor – CB, CE, CC Configurations and Characteristics – Elementary Treatment of Signal Amplifier. **12**

UNIT IV DIGITAL ELECTRONICS

Binary Number System – Logic Gates – Boolean Algebra – Half and Full Adders - Flip – Flops - Registers and Counters – A/D and D/A Conversion (simple concepts).

12

UNIT V FUNDAMENTALS OF COMMUNICATION ENGINEERING

Types of Signals: Analog and Digital Signals – Modulation and Demodulation: Principles of Amplitude and Frequency Modulations.

Communication System: Radio, TV, Fax, Microwave, Satellite and Optical Fiber (Block Diagram Approach only).

12

TEXT BOOKS:

1. “Basic Electrical and Electronics Engineering”, Dr.N.Premkumar, 4th Edition, 2008, Anuradha Publications, Kumbakonam.

REFERENCES:

1. “Electrical and Electronic Technology”, Edward Hughes, 9th Edition, Pearson Publications, India.

2. “Electrical Machines – II”, J.B.Gupta, 3rd Edition, 2000, S.K.Kataria & Sons, New Delhi.

3. “A Text Book of Electrical Technology”, Theraja.B.L, Volume-II, 2005, S.Chand & Co Ltd.

6) 10AEE02 BASIC CIVIL & MECHANICAL ENGINEERING

A – CIVIL ENGINEERING

(For circuit branches)

L	T	P	C
4	0	0	4

UNIT I SURVEYING AND CIVIL ENGINEERING MATERIALS

Surveying**:** Objects - types – classification – principles – measurements of distances – angles – leveling – determination of areas – illustrative examples
Civil Engineering Materials: Bricks – stones – sand – cement – concrete- steel sections **12**

UNIT II BUILDING COMPONENTS AND STRUCTURES

Foundations: Types, Bearing capacity – Requirement of good foundations
Superstructure: Brick masonry – stone masonry – beams – columns – lintels – roofing – flooring – plastering – Mechanics – Internal and external forces – stress – strain – elasticity – types of Bridges and Dams – Basics of Interior Design and Landscaping **12**

B – MECHANICAL ENGINEERING

UNIT III POWER PLANT ENGINEERING

Introduction, Classification of Power Plants – Working principle of steam, Gas, Diesel, Hydro-electric and Nuclear power Plants – Merits and Demerits – Pumps and turbines – working principle of Reciprocating pumps (single acting and double acting) – Centrifugal Pump **12**

UNIT IV I C ENGINES

Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines – Boiler as power plant **12**

UNIT VREFRIGERATION AND AIR CONDITIONING SYSTEMS

Terminology of Refrigeration and Air Conditioning, Principle of vapor compression and absorption system – Layout of typical domestic refrigerator – Window and Split type room Air conditioner. **12**

TEXT BOOKS:

1. “Basic Mechanical Engineering”, Venugopal K and Prahu Raja V, Anuradha Publishers, Kumbakonam, (2000).

2. “Basic Civil and Mechanical Engineering”, Shanmugam G and Palanichamy M S, Tata McGraw Hill Publishing Co., New Delhi, (1996).

REFERENCES:

1. “Basic Civil Engineering”, Ramamrutham. S, Dhanpat Rai Publishing Co. (P) Ltd. (1999).

2. “Basic Civil Engineering”, Seetharaman S. Anuradha Agencies, (2005).

3. “Basic Mechanical Engineering”, Shantha Kumar S R J., Hi-tech Publications, Mayiladuthurai, (2000).

7) 10APCL	PHYSICS LABORATORY – II	L T P C 0 0 3 2

LIST OF EXPERIMENTS

1. Determination of Young's modulus of the material – non uniform bending.
2. Determination of Band Gap of a semiconductor material.
3. Determination of specific resistance of a given coil of wire – Carey Foster Bridge.
4. Determination of viscosity of liquid – Poiseuille's method.
5. Spectrometer dispersive power of a prism.
6. Determination of Young's modulus of the material – uniform bending.

• **A minimum of FIVE experiments shall be offered.**

• **Laboratory classes on alternate weeks for Physics and Chemistry.**

• **The lab examinations will be held only in the second semester.**

CHEMISTRY LABORATORY – II

LIST OF EXPERIMENTS

1. Conduct metric titration (Simple acid base)
2. Conduct metric titration (Mixture of weak and strong acids)
3. Conduct metric titration using $BaCl_2$ vs. $Na_2 SO_4$
4. Potentiometric Titration (Fe^{2+} / $KMnO_4$ or $K_2Cr_2O_7$)
5. PH titration (acid & base)
6. Determination of water of crystallization of a crystalline salt (Copper sulphate)
7. Estimation of Ferric iron by spectrophotometry.

§ **A minimum of FIVE experiments shall be offered.**

§ **Laboratory classes on alternate weeks for Physics and Chemistry.**

§ **The lab examinations will be held only in the second semester.**

8) 10ACPL02 COMPUTER PRACTICE LABORATORY II

L	T	P	C
0	1	2	2

- Basic Commands in UNIX
- Working with files
  - Files and File types
  - Sorting the contents of a file
  - Counting the number of words in a file
- Working with Directories
- UNIX Editor
- Pipes
- Simple Filters
- Command line parameters with simple UNIX commands
- Shell Programming Fundamentals
  - Shell Variables
  - Conditional Statements
  - Testing and Loops
  - Simple shell Programs
  - Grep and Sedcommands
  - Awk filter
  - Security commands
- UNIX C
  - Simple C programs to simulate the basic UNIX commands (Fork, Signal)
  - File handling

HARDWARE / SOFTWARE REQUIREMENTS FOR A BATCH OF 30 STUDENTS

Hardware

1 UNIX Clone Server
33 Nodes (thin client or PCs)
Printer – 3 Nos

Software

OS-UNIX clone (33 user license or License free Linux)

Compiler- C

9) 10ACML02 COMPUTER AIDED DRAFTING AND MODELING LABORATORY

(For all Non- Circuit Branches)

L	T	P	C
0	1	2	2

List of Exercises using software capable of Drafting and Modeling

1. Study of capabilities of software for Drafting and Modeling – Coordinate Systems (absolute, relative, polar, etc.) – Creation of simple figures like polygon and general multi-line figures
2. Drawing of a Title Block with necessary text and projection symbol
3. Drawing of curves like parabola, spiral, involute using B-spline or cubic spline.
4. Drawing of front view and top view of simple solids like prism, pyramid, cone, etc, and dimensioning.
5. Drawing front view, top view and side view of objects from the given pictorial views (eg. V-block, Base of a mixie, Simple Stool, Objects with hole and curves)
6. Drawing of a plan of residential building (Two bed rooms, Kitchen, hall, etc.,)
7. Drawing of a simple steel truss
8. Drawing sectional views of prism, pyramid, cylinder, cone, etc.
9. Drawing isometric projection of simple objects
10. Creation of 3-D models of simple objects and obtaining 2-D muti-view drawings from 3-D model

Note: Plotting of drawings must be made for each exercise and attached to the records written by students.

List of Equipments for a batch of 30 students:

- Pentium IV Computer or better hardware, with suitable graphics facility - 30 No
- Licensed software for Drafting and Modeling. 30 Licenses
- Laser Printer or Plotter to print / plot drawings 2 No

9) 10AECL02 ELECTRICAL CIRCUIT LABORATORY

(Common to EEE, EIE and ICE)

LIST OF EXPERIMENTS

1. Verification of Ohm's laws and Kirchoff's laws
2. Verification of Thevenine's and Norton's DTheorem
3. Verification of Superposition Theorem
4. Verification of maximum power transfer theorem
5. Verification of reciprocity theorem
6. Measurements of self inductance of a coil
7. Verification of mesh and nodal analysis
8. Transient response of RL and RC circuits for DC inputs
9. Frequency response of series and parallel resonance circuits
10. Frequency response of single tuned coupled circuits
11. Measurement of inductance and Capacitance phase angle using LCR Meter
12. Measurement of Magnitude & Frequency for different wave forms (Sine, Square& Triangular waveforms)

9) 10ACDL02 CIRCUITS AND DEVICES LABORATORY

(For branches under I & C Faculty)

1. Verification of KVL and KCL
2. Verification of Thevenin and Norton Theorems
3. Verification of Superposition Theorem.
4. Verification of Maximum Power Transfer and Reciprocity Theorems
5. Frequency Response of Series and Parallel Resonance Circuits
6. Characteristics of PN and Zener Diode
7. Characteristics of CE Configuration
8. Characteristics of CB Configuration
9. Characteristics of UJT and SCR
10. Characteristics of JFET and MOSFET
11. Characteristics of Diac and Triac
12. Characteristics of Photodiode and Phototransistor