ANNA UNIVERSITY TIRUCHIRAPPALLI
TIRUCHIRAPPALLI - 620 024

Regulations 2008

Curriculum

B.E. MARINE ENGINEERING

(To be followed from the Academic year 2008 – 2009 onwards)

SEMESTER I

S.No.	Subject Code	Subject	L	T	P	C
Theory						
1	**HS1101**	Technical English I*	3	1	0	4
2	**MA1101**	Mathematics I*	3	1	0	4
3	**HS1102**	Engineering Physics I*	3	0	0	3
4	**HS1105**	Chemistry for Marine Engineering	3	0	0	3
5	**MV1101**	Basics for Marine Engineering	4	0	0	4
6	**CS1101**	Fundamentals of Computing and Programming*	3	1	0	4
7	**ME1101**	Engineering Graphics*	2	3	0	5
Practical						
8	**HS1104**	Δ Physics and Chemistry Laboratory I*	0	0	3	-
9	**GE1101**	Engineering Practices Laboratory*	0	0	3	2
10	**CS1102**	Computer Practice Laboratory I*	0	0	3	2
					Total	**31**

Δ Laboratory classes on alternate weeks for Physics and Chemistry. The lab examinations will be held only in the second semester (Including the first semester experiments also).

*** The Syllabus is common as of B.E. / B.Tech.**

SEMESTER II

S.No.	Subject Code	Subject	L	T	P	C
Theory						
1.	**HS1151**	Technical English II*	3	1	0	4
2.	**MA1151**	Mathematics II*	3	1	0	4
3.	**HS1152**	Engineering Physics II*	3	0	0	3
4.	**EE1153**	Basic Electrical and Electronics Engineering*	4	0	0	4
5.	**MV1151**	Marine Engineering Thermodynamics	4	0	0	4
6.	**CE1151**	Engineering Mechanics*	3	1	0	4
Practical						
7.	**CS1151**	Computer Practices Laboratory II*	0	1	2	2
8.	**HS1154**	Physics and Chemistry Laboratory II*	0	0	3	2
9.	**ME1151**	Computer Aided Drafting & Modeling Laboratory *	0	1	2	2
10.	**ME1152**	Workshop Fitting**	0	0	3	2
11.	**HS1155**	English Language Laboratory *+	0	0	2	-
					Total	**31**

* **The Syllabus is common as of B.E. / B.Tech.**

** **This course and syllabi are prescribed as per the directions of the Director General of Shipping. Govt. of India**

\+ **Offering English Language Laboratory as an additional subject (with no marks) during 2nd semester may be decided by the respective Colleges affiliated to Anna University Chennai.**

ANNA UNIVERSITY TIRUCHIRAPPALLI
TIRUCHIRAPPALLI 620 024

Regulations 2008

Syllabus

B.E. MARINE ENGINEERING

SEMESTER I

HS1101 - TECHNICAL ENGLISH I

L	T	P	C
3	1	0	4

UNIT I FOCUS ON LANGUAGE: VOCABULARY 9+3

General Vocabulary - Changing words from one form to another - Nouns – Compound nouns – Adjectives, Comparative adjectives - Adverbs – Adverb forms – Prefixes and Suffixes – Spelling and Punctuation – British and American vocabulary .

UNIT II FOCUS ON LANGUAGE: GRAMMAR 9+3

Subject-Verb Agreement - Tenses – Present Tense – Past Tense – Future Tense - Active and Passive Voice – Gerunds and Infinitives - Cause and Effect Expressions – 'If' conditionals – Correction of Errors.

UNIT III READING 9+3

Skimming for gist – Scanning for specific information – Inference – Reading in Context – Intensive Reading - Graphic Presentation: Bar Chart and Flow Chart – Sequencing of Sentences.

UNIT IV WRITING 9+3

Paragraph Writing – Description – Comparison and Contrast – Definition – Instructions – Formal Letter Writing – Letters to the Editor – Accepting and Declining an Invitation – Permission Letter.

UNIT V LISTENING AND SPEAKING 9+3

Listening and transfer of information – Listening and Note-taking – Creative Thinking and Speaking – Conversation Techniques - Persuasive Speaking – Group Discussion and Oral Reports - Speaking about Future Plans.

L: 45 T: 15 Total: 60

TEXT BOOK

1. Meenakshi Raman and Sangeeta Sharma, 'Technical Communication: English Skills for Engineers', New Delhi: Oxford University Press, 2008.

REFERENCES

1. Department of Humanities and Social Sciences, Anna University, 'English for Engineers and Technologists' Combined Edition (Volumes 1 and 2), Chennai: Orient Longman Pvt. Ltd., 2006. Themes 1 – 4 (Resources, Energy, Computer, Transport)
2. Andrea, J. Rutherford, 'Basic Communication Skills for Technology', Second Edition, Pearson Education, 2007.

MA1101 - MATHEMATICS I

L	T	P	C
3	1	0	4

UNIT I MATRICES 9+3

Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values – Problem solving using Cayley-Hamilton theorem – Similarity transformation – Orthogonal transformation of a symmetric matrix to diagonal form – Quadratic form – Orthogonal reduction to its canonical form.

UNIT II THREE DIMENSIONAL GEOMETRY 9+3

Angle between two lines – Coplanar lines – Shortest distance between skew lines – Equation of a sphere – Plane section of a sphere – Tangent plane – Orthogonal Spheres - Equation of a cone – Right circular cone – Equation of a cylinder – Right circular cylinder.

UNIT III DIFFERENTIAL CALCULUS 9+3

Curvature – Cartesian and Parametric Co-ordinates – Centre and Radius of curvature – Circle of curvature – Envelopes – Evolutes.

UNIT IV FUNCTIONS OF SEVERAL VARIABLES 9+3

Partial derivatives – Euler's theorem for homogeneous functions – Total derivative – Differentiation of implicit functions – Jacobians – Maxima / Minima for functions of two variables – Method of Lagrange's multipliers – Taylor's expansion.

UNIT V ORDINARY DIFFERENTIAL EQUATIONS (ODE) 9+3

Solution of second and higher order linear ODE with constant coefficients – Simultaneous first order linear equations with constant coefficients – Linear equations of second order with variable coefficients – Cauchy's and Legendre's linear equations – Method of variation of parameter.

L: 45 T: 15 Total: 60

TEXT BOOKS

1. Grewal, B.S, "Higher Engineering Mathematics", Thirty eighth Edition, Khanna Publishers, New Delhi, 2005.
2. Venkataraman. M. K., "Engineering Mathematics", Volume I and II Revised enlarged Fourth Edition, The National Publishing Company, Chennai, 2004.

REFERENCES

1. Glyn James., "Advanced Modern Engineering Mathematics", Third Edition, Pearson Education Ltd, New Delhi, 2004.
2. Veerarajan. T., "Engineering Mathematics (for first year)", Fourth Edition, Tata McGraw – Hill Publishing Company Limited, New Delhi, 2005.
3. Bali N. P and Manish Goyal, "Text book of Engineering Mathematics", Third edition, Laxmi Publications (P) Ltd., 2008.

HS1102 - ENGINEERING PHYSICS I

L	T	P	C
3	0	0	3

UNIT I ULTRASONICS 9

Introduction – Production – magnetostriction effect - magnetostriction generator - piezoelectric effect - piezoelectric generator- Detection of ultrasonic waves properties - Cavitations - Velocity measurement – Acoustic Grating - SONAR - Non Destructive Testing - Pulse echo system through transmission and reflection modes - A, B and C - scan displays – Applications of Ultrasonics - Industrial and Medical - Sonogram

UNIT II LASERS 9

Introduction – Principle of Spontaneous emission and stimulated emission. Population inversion, pumping. Einsteins A and B coeffcients - derivation. Types of lasers – He - Ne, CO_2, Nd -YAG, Semiconductor lasers (homojunction and heterojunction) - Qualitative Industrial and Medical applications of Lasers - Holography – Construction and reconstruction of a Hologram- applications of a Hologram

UNIT III FIBRE OPTICS 9

Principle and propagation of light in optical fibres – Numerical aperture and Acceptance angle - Types of optical fibres (material, refractive index, mode) – Double crucible technique of fibre drawing - Losses in an optical fibre – Attenuation, Dispersion and Bending losses - Fibre optical communication system (Block diagram) - Light sources and detectors - Fibre optic sensors – Temperature and Displacement Sensors - Endoscope.

UNIT IV QUANTUM PHYSICS 9

Black body radiation – Planck's theory (derivation) – Deduction of Wien's displacement law and Rayleigh – Jeans' Law from Planck's theory – Compton effect -Theory and experimental verification – Matter waves - Electron microscope – Schrödinger's wave equation – Time independent and time dependent equations – Physical significance of wave function – Particle in a one dimensional box – Electrons in a metal - Degeneracy

UNIT V CRYSTAL PHYSICS 9

Lattice – Unit cell – Bravais lattice – Lattice planes – Miller indices – Interplanar spacing 'd' in a cubic lattice – Calculation of number of atoms per unit cell – Atomic radius – Coordination number – Packing factor for SC, BCC, FCC and HCP structures – NaCl, ZnS, Diamond and Graphite structures.

L : 45 Total: 45

TEXT BOOKS

1. R. K. Gaur and S.C. Gupta, 'Engineering Physics' Dhanpat Rai Publications, 2003.
2. M.N. Avadhanulu and PG Kshirsagar, 'A Text book of Engineering Physics', S.Chand and Company, Ltd., New Delhi, 2005.

REFERENCES

1. Chitra Shadrach and Sivakumar Vadivelu, 'Engineering Physics', Pearson Education, 2007.
2. Serway and Jewett, 'Physics for Scientists and Engineers with Modern Physics', 6th Edition, Thomson Brooks/Cole, Indian reprint 2007.
3. Arumugam, M, 'Engineering Physics', Anuradha Publishers, Kumabakonam 2005.
4. Palanisamy, P.K., 'Engineering Physics' Scitech publications, 2007.
5. Rajendran, V and Marikani A, 'Engineering Physics' Tata Mc Graw Hill Publications Ltd, III Edition, 2004.

HS1105 - CHEMISTRY FOR MARINE ENGINEERING

L	T	P	C
3	0	0	3

UNIT I WATER TECHNOLOGY 09

Water and it's impurities – Impurities in water – fresh water, sea water, distilled water impurities. Purpose of water treatment in boilers, scale formation and prevention.

UNIT II BOILER CHEMISTRY 09

Boiler corrosion – fretting, pitting corrosion, corrosion fatigue, atoms and ions, electro chemical corrosion, hydrogen and hydroxyl ions, types and causes of corrosion and it's control ; chemical and mechanical deareation, methods of chemical deareation, de-zincification, stress corrosion,

UNIT III BOILER WATER TREATMENT 09

Lime and Soda treatment, PH treatment, salinometer, use of litmus paper, test for partial, total alkalinity, chloride, sulphite, phosphate test, caustic soda treatment, condensate lime treatment. De-salination of water, reverse osmosis and electro dialysis, priming, foaming and control, effects of salts and gases in feed water

UNIT IV WATER HARDNESS ANALYSIS 09

Hardness, units of hardness, estimation of hardness by EDTA method, treatment for hardness, total dissolved solids, dissolved oxygen test, use of coagulants, typical test valves for smoke and water tube boilers.

UNIT V ENERGY SOURCES AND NANOCHEMISTRY 09

Introduction - Properties (Electrical, Mechancial and vibration) – carbon nano tubes - Applications in fuel cells, catalysis and use of gold nanoparticles - batteries – secondary batteries - alkaline batteries – lead acid, Ni – Cd and Li batteries, principles and applications of solar cells, fuels cells - Hydrogen and methanol.

Total: **45 Periods**

TEXT BOOKS

1. Jain.P.C. and Monika Jain, Engineering Chemistry, 4th Edition, Dhanpat Rai and Sons, New Delhi, 2002.
2. Milton and Leech , "Marine Boilers ".Butter Worth Publishers, UK

REFERENCES

1. Uppal. M.M., A Text book of Engineering Chemistry, 7th Editions, Khanna Publishing, 1988.

   Water Treatment by J.D. Skelly Imarest Publication , London.
2. Reed's General Engineering Knowledge for Marine Engineers by Leslie Jackson and Thomas D. Morton.

MV1101 - BASICS FOR MARINE ENGINEERING

L	T	P	C
4	0	0	4

UNIT I ENERGY RESOURCES AND POWER GENERATION 12

Renewable and Non-renewable resources – thermal, hydel, solar, wind, tidal, geothermal and nuclear – Indian energy scenario.

Power Plants - Steam, gas turbine, diesel, nuclear and hydel power plants – Layout, major components and working, Choice of the type of plant, Combined cycles, cogeneration, Importance of Energy storage, Environmental constraints of power generation using fossil fuels and nuclear energy.

Steam generators - Classification, working or Cochran, Babcock Wilcox, Lamont and Benson boilers, Principles and features of modern high pressure boiler – tower type boilers. (A separate study of boiler mountings and accessories are beyond the scope of this course).

UNIT II MARINE I.C. ENGINES 12

Classification, Working principles of petrol and diesel engines - two stroke and four stroke cycles, functions of main components, Carburetion - Single jet Carburetor, mixture strength, Ignition system of petrol engine, Fuel pump and injector of diesel engine, Cooling system – necessity, air and liquid cooling, optimum cooling, Lubrication system – purpose and methods of lubrication, lubrication oil classification and selection.

UNIT III REFRIGERATION AND AIR CONDITIONING 12

Refrigeration – application and types, Vapour compression refrigeration system – working principles and features, working fluids.

Air conditioning – requirement of conditioned air, summer and winter air conditioning, layout of a typical window air conditioner, Thermoelectric cooling.

UNIT IV METAL FORMING, METAL JOINING PROCESSES 12

Metal forming – Principles of forging – mechanical power hammers – Hot and Cold forging processes – rolling, drawing and extrusion, Metal joining processes – flexible and permanent, Principles of welding – Fundamentals of arc welding, gas welding and gas cutting, Brazing and Soldering

UNIT V POWER TRANSMISSION 12

Brief introduction to belt and rope drives. Simple and compound gear trains. Machine Tool Engineering - Main Components and functions of lathe, drilling, shaping, planning and milling machines.

Introduction to CAD, CAM, CIM and ROBOT.

Total: 60 Periods

TEXT BOOKS

1. Taylor, ‘‘Introduction to Marine engineering”, 2nd Edition, Butterworth Heinemann, London, 1999
2. Shanmugam.G., Basic Mechanical Engineering 3rd Edition, TATA McGraw-Hill, New Delhi, Year 2000

REFERENCES

1. K. Venugopal, Basic Mechanical Engineering, Fourth Edition, Anuradha Agencies, Chennai, Year 1994.
2. Duraivelu. K., Richard. S., Basic Mechanical Engineering, 2nd Edition, Dear Publication, Chennai, 2001.
3. Reed’s General Engineering Knowledge for Marine Engineers by Leslie Jackson and Thomas D. Morton.

CS1101 - FUNDAMENTALS OF COMPUTING AND PROGRAMMING

L	T	P	C
3	1	0	4

UNIT I DIGITAL CONCEPTS 9+3

Digital Computer Fundamentals – Block diagram of a computer – Components of a computer system – Digital and Analog quantities – Binary digits – Logic Levels – Digital Waveforms – Basic Logic operations – Digital Integrated Circuits.

UNIT II NUMBER SYSTEMS 9+3

Number Representation – Decimal, Binary, Octal, Hexadecimal and BCD numbers – Binary Arithmetic – Binary addition – Unsigned and Signed numbers – one's and two's complements of Binary numbers – Arithmetic operations with signed numbers - Number system conversions – Digital codes.

UNIT III HARDWARE AND SOFTWARE 9+3

Processing Devices – Memory Devices – Input and Output Devices – Optical Input Devices – Audiovisual Input Devices – Monitors – Printing Devices - Storage Devices – Magnetic and Optical Storage Devices - System Software – Application Software – Graphics and Multimedia.

UNIT IV NETWORKING FUNDAMENTALS 9+3

Overview of Data Communication with Standard Telephone Lines and Modems, Digital Data Connections, Broadband Connections, DSL Technologies and Cable Modem Connections – Computer Networking Basics – Common Types of Networks – Structuring of Networks – Network Media and Hardware.

UNIT V PROBLEM SOLVING AND C PROGRAMMING 9+3

Planning the Computer Program – Purpose – Algorithm – Flow Charts – Pseudocode – Programming fundamentals – Variables and Data Types – Constants – Preprocessor – Operators and Expressions – Managing Input and Output operators – Decision Making – Branching and Looping – User-defined Functions – Declarations – Call by reference – Call by value – Arrays – Pointers – Handling of Character Strings – Structures and Unions.

L: 45 T: 15 Total: 60

TEXT BOOKS

1. Thomas L.Floyd and R.P.Jain,"Digital Fundamentals",8th Edition, Pearson Education,2007.
2. Peter Norton "Introduction to Computers",6th Edition, Tata Mc Graw Hill, New Delhi,2006.
3. Ashok.N.Kamthane, "Computer Programming", Pearson Education (India), 2008.

REFERENCES

1. Behrouz A. Forouzan and Richard.F.Gilberg, "A Structured Programming Approach Using C", II Edition, Brooks-Cole Thomson Learning Publications, 2007.
2. Morris Mano, "Digital Design", 3rd Edition, Pearson Education, 2006.
3. Albert Paul Malvino, Donald P. Leech, "Digital Principles and Applications", 6th Edition, Mc Graw Hill Publishers, 2007.

ME1101 - ENGINEERING GRAPHICS

L	T	P	C
2	3	0	5

Concepts and conventions (Not for Examination) **1**

Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I PLANE CURVES AND FREE HAND SKETCHING 15

Curves used in engineering practices:

Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of squad and circle – Drawing of tangents and normal to the above curves.

Free hand sketching:

Representation of Three Dimensional objects – General principles of orthographic projection – Need for importance of multiple views and their placement – First angle projection – layout views – Developing visualization skills through free hand sketching of multiple views from pictorial views of objects.

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACES 14

Projection of points and straight lines located in the first quadrant – Determination of true lengths and true inclinations – Projection of polygonal surface and circular lamina inclined to both reference planes.

UNIT III PROJECTION OF SOLIDS 15

Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.

UNIT IV SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES 15

Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other – Obtaining true shape of section.

Development of lateral surfaces of simple and truncated solids – Prisms, pyramids, cylinders and cones – Development of lateral surfaces of solids with cylindrical cutouts, perpendicular to the axis.

UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS 15

Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones.

Perspective projection of prisms, pyramids and cylinders by visual ray method.

L: 30 T: 45 Total: 75

TEXT BOOKS

1. K. V. Natrajan, “A text book of Engineering Graphics”, Dhanalakshmi Publishers, Chennai (2006).
2. M.B. Shah and B.C. Rana, “Engineering Drawing”, Pearson Education (2005).

REFERENCES

1. N.D. Bhatt, “Engineering Drawing” Charotar Publishing House, 46th Edition, (2003).
2. Luzadder and Duff, ‘Fundamentals of Engineering Drawing’, Prentice Hall of India Pvt. Ltd. 11th Edition, 2001
3. Dhananjay A.Jolhe, “Engineering Drawing with an introduction to AutoCAD” Tata McGraw Hill Publishing Company Limited (2008).

HS1104 - PHYSICS CHEMISTRY LABORATORY I

L	T	P	C
0	0	3	-

PHYSICS LABORATORY I

LIST OF EXPERIMENTS

1. (a) Particle size determination using Diode Laser.
   (b) Determination of Laser parameters – Wavelength, and Angle of divergence.
   (c) Determination of Acceptance angle in an Optical Fiber.
2. Determination of thickness of a thin wire – Air wedge method.
3. Determination of velocity of sound and compressibility of liquid – Ultrasonic Interferometer.
4. Determination of wavelength of Mercury spectrum – Spectrometer grating.
5. Determination of thermal conductivity of a bad conductor – Lee's Disc method.
6. Determination of Hysteresis loss in a Ferromagnetic material.

CHEMISTRY LABORATORY I

LIST OF EXPERIMENTS

1. Estimation of Hardness of Water by EDTA method.
2. Estimation of Copper in brass by EDTA method.
3. Determination of DO in water by Winkler's method.
4. Estimation of Chloride in Water sample by Argentometric method.
5. Estimation of alkalinity of Water sample.
6. Determination of molecular weight and degree of polymerization using Viscometry.

- **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.**

GE1101 - ENGINEERING PRACTICES LABORATORY
GROUP A (CIVIL AND MECHANICAL)

L	T	P	C
0	0	3	2

I CIVIL ENGINEERING PRACTICE 9

Buildings:

(a) Study of plumbing and carpentry components of residential and industrial buildings. Safety aspects.

Plumbing Works:

(a) Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings.

(b) Study of pipe connections requirements for pumps and turbines.

(c) Preparation of plumbing line sketches for water supply and sewage works.

(d) Hands-on-exercise:

Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components.

(e) Demonstration of plumbing requirements of high-rise buildings.

Carpentry using Power Tools only:

(a) Study of the joints in roofs, doors, windows and furniture.

(b) Hands-on-exercise:

Wood work, joints by sawing, planning and cutting.

II MECHANICAL ENGINEERING PRACTICE 13

Welding:

(a) Preparation of arc welding of butt joints, lap joints and tee joints.

(b) Gas welding practice.

Basic Machining:

(a) Simple turning and Taper turning.

(b) Drilling practice.

Sheet Metal Work:

(a) Forming and Bending:

(b) Model making – Trays, Funnels, etc.

(c) Different type of joints.

Machine assembly practice:

(a) Study of centrifugal pump.

(b) Study of air conditioner.

Demonstration on:

(a) Smithy operations, upsetting, swaging, setting down and bending. Example – Exercise – Production of hexagonal headed bolt.

(b) Foundry operations like mould preparation for gear and step cone pulley.

(c) Fitting – Exercises – Preparation of square fitting and vee – fitting models.

GROUP B (ELECTRICAL AND ELECTRONICS)

III ELECTRICAL ENGINEERING PRACTICE 10

1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lamp wiring.
3. Stair-case wiring.
4. Measurement of electrical quantities – voltage, current, power and power factor in RLC circuit.
5. Measurement of energy using single phase energy meter.
6. Measurement of resistance to earth of an electrical equipment.

IV ELECTRONICS ENGINEERING PRACTICE 13

1. Study of Electronic components and equipments – Resistor, colour coding measurement of AC signal parameter (peak-peak, rms period, frequency) using CR.
2. Study of logic gates AND, OR, EOR and NOT.
3. Generation of Clock Signal.
4. Soldering practice – Components Devices and Circuits – Using general purpose PCB.
5. Measurement of ripple factor of HWR and FWR.

P : 22+23 Total : 45

REFERENCES

1. K.Jeyachandran, S.Natarajan and S, Balasubramanian, "A Primer on Engineering Practices Laboratory" , Anuradha Publications, 2007.
2. T.Jeyapoovan, M.Saravanapandian and S.Pranitha, "Engineering Practices Lab Manual", Vikas Puplishing House Pvt.Ltd, 2006
3. H.S. Bawa, "Workshop Practice", Tata McGraw – Hill Publishing Company Limited, 2007.
4. A. Rajendra Prasad and P.M.M.S. Sarma, "Workshop Practice", Sree Sai Publication, 2002.
5. P.Kannaiah and K.L.Narayana, "Manual on Workshop Practice", Scitech Publications, 1999.

CS1102 - COMPUTER PRACTICE LABORATORY I

L	T	P	C
0	0	3	2

LIST OF EXERCISES

Concepts	Suggested Exercises
UNIT I	
Introduction to Application Packages	Practical Exercises may be given in the application packages to acquire skills in word processing ,Spread sheet and Power Point.
Word	1. Document creation, Text manipulation with Scientific notations. 2. To create an advertisement in word. 3. To illustrate the concept of mail merging, importing images, tables in word. 4. Drawing - flow Chart
Spreadsheet	5. Chart - Line, XY, Bar and Pie. 6. Formula - formula editor. 7. Spread sheet - inclusion of object, Picture and graphics, protecting the document and sheet 8. To create a spread sheet to analyze the marks of the students of a class and also to create appropriate charts. 9. Sorting and Import / Export features.
Power Point	10. To create the presentation for the department with Power Point using animation, Design Templates and Effective presentation.
UNIT II	
C Programming Basics*	The following exercises may be suggested
Data types, Expression Evaluation, Condition Statements,Operators and Expressions	11. To write a simple menu driven calculator program using switch statement, 12. To Find Age in terms of years, months and days.
IO Formatting	0. To print multiplication table for the given number.
Decision Making	0. To check and print if the given number is a palindrome or not, and the given number is a prime number or not
Looping	To print Fibonacci and Trigonometric series.

	Exercises may be given to understand function prototype and invocation procedures, to understand call by value, call by address and implement recursion.
UNIT III	
Arrays	15. To find the largest and smallest number using array 16. To Sort numbers in an array in ascending / Descending order. 0. To implement bubble sorting. 0. To reverse the elements given in an array. 0. Write a program for matrix addition and multiplication
String Manipulations	0. To implement string manipulation functions without using library functions. 0. To arrange the names in alphabetic order.
Functions	0. To perform sequential search using functions.
Recursions	0. To find the factorial of a number using recursion.
UNIT IV	
Structures and Unions	0. To print the marksheet of 'n' students using structures.
Pointers	0. To print the elements of an array using pointers and String manipulation.
Files	0. To print the marksheet of 'n' students using file handling operations.
UNIT V	
Command line arguments	0. To merge two files using command line arguments.

Total:45

* For programming exercises Flow chart and Pseudo code are essential

HARDWARE / SOFTWARE REQUIRED FOR A BATCH OF 30 STUDENTS

Hardware

- LAN System with 33 nodes (OR) Standalone PCs – 33 Nos.
- Printers – 3 Nos.

Software

- OS – Windows / UNIX Clone
- Application Package – Office suite
- Compiler – C

SEMESTER II

HS1151 - TECHNICAL ENGLISH II

L	T	P	C
3	1	0	4

UNIT I FOCUS ON LANGUAGE: VOCABULARY 9+3

Technical Vocabulary – Synonyms and antonyms - Different grammatical forms of the same word – Numerical adjectives – Articles – Conjunctions and prepositions – Conjunctions used in adverbial phrases and clauses – Abbreviations and acronyms – Foreign words and phrases

UNIT II FOCUS ON LANGUAGE: GRAMMAR 9+3

Phrases and structures indicating use and purpose – Cause and effect expressions – Using connectives – Imperative and 'should' – Yes/ No question forms – Reported speech – Relative clauses – Adverbial clauses of time, place and manner

UNIT III READING 9+3

Intensive reading and predicting content – Meanings in context - Reading and interpretation – Critical reading – Creative and critical thinking – Note-making

UNIT IV WRITING 9+3

Paragraph development - Process description – Descriptive writing - Writing analytical paragraphs – Recommendations – Instructions – Checklists - Letter of application – content, format – Writing an essay – Proposals – Report Writing – Types, format, structure, data collection, content, form

UNIT V LISTENING AND SPEAKING 9+3

Non-verbal communication – Listening – Stress and intonation - Correlating verbal and non-verbal communication – Speaking in group discussions – Discussion of problems and solutions – Oral instructions

L: 45 T: 15 Total : 60

TEXT BOOK

1. Meenakshi Raman and Sangeeta Sharma, 'Technical Communication: English Skills for Engineers', New Delhi: Oxford University Press, 2008.

REFERENCES

1. Department of Humanities and Social Sciences, Anna University, 'English for Engineers and Technologists' Combined Edition (Volumes 1 and 2), Chennai: Orient Longman Pvt. Ltd., 2006. Themes 1 – 4 (Resources, Energy, Computer, Transport)
2. Andrea, J. Rutherford, 'Basic Communication Skills for Technology', Second Edition, Pearson Education, 2007.

MS1151 - MATHEMATICS II

L	T	P	C
3	1	0	4

UNIT I LAPLACE TRANSFORMS 9+3

Transforms of elementary functions – Basic properties – Transforms of derivatives and integrals – Initial and final value theorems – Inverse Laplace transforms – Convolution theorem – Solution of Ordinary Differential Equations with constant coefficients using Laplace transforms – Transform of periodic functions – Solution of integral equations.

UNIT II VECTOR CALCULUS 9+3

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

UNIT III ANALYTIC FUNCTIONS 9+3

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.

UNIT IV MULTIPLE INTEGRALS 9+3

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 a triple integral.

UNIT V COMPLEX INTEGRATION 9+3

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 – Semicircular contours with no pole on real axis.

L: 45 T: 15 Total : 60

TEXT BOOK

1. Grewal, B.S., "Higher Engineering Mathematics", Thirty eighth Edition, Khanna Publishers, New Delhi, 2005.
2. Venkataraman. M. K., "Engineering Mathematics", Volume I and II Revised enlarged Fourth Edition, The National Publishing Company, Chennai, 2004.

REFERENCES

1. Glyn James., "Advanced Modern Engineering Mathematics", Third Edition,Pearson Education Ltd, New Delhi, 2004.
2. Veerarajan. T., "Engineering Mathematics (for first year)", Fourth Edition, Tata McGraw – Hill Publishing Company Limited, New Delhi, 2005.
3. Bali N. P and Manish Goyal, " Text book of Engineering Mathematics", Third edition, Laxmi Publications(p) Ltd., 2008.

HS1152 - ENGINEERING PHYSICS II

L	T	P	C
3	0	0	3

UNIT I CONDUCTING MATERIALS 8

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

UNIT II SEMICONDUCTING MATERIALS 9

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 semiconductor (Qualitative) – variation of Fermi level with temperature and impurity concentration – compound semiconductors – Hall effect –Determination of Hall coefficient – Applications.

UNIT III MAGNETIC AND SUPERCONDUCTING MATERIALS 10

Origin of magnetic moment – Bohr magneton – Dia and para magnetism – Ferro magnetism – Domain theory – Hysteresis – soft and hard magnetic materials – anti – ferromagnetic materials – Ferrites – applications – magnetic recording and readout – storage of magnetic data – tapes, floppy and magnetic disc drives.

Superconductivity : properties - Types of super conductors – BCS theory of superconductivity (Qualitative) - High Tc superconductors – Applications of superconductors – Josephson Effect – Josephson Junction -SQUID, cryotron, magnetic levitation.

UNIT IV DIELECTRIC MATERIALS 9

Electrical susceptibility – dielectric constant – electronic, ionic, orientational and space charge polarization – frequency and temperature dependence of polarisation – internal field – Claussius – Mosotti relation (derivation) – dielectric loss – dielectric breakdown – uses of dielectric materials (capacitor and transformer) – Ferroelectricity and applications.

UNIT V MODERN ENGINEERING MATERIALS 9

Metallic glasses: preparation, properties and applications.

Shape memory alloys (SMA): Characteristics, properties of NiTi alloy, application, advantages and disadvantages of SMA

Nanomaterials: synthesis –plasma arcing – pulsed laser deposition - chemical vapour deposition – sol-gel – electrodeposition – ball milling - properties of nanoparticles and applications.

Carbon nanotubes: structure, properties and applications.

Total: 45

TEXT BOOKS

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

REFERENCES

1. Chitra Shadrach and Sivakumar Vadivelu, ‘Engineering Physics’, Pearson Education, New Delhi, (2007).
2. M. Arumugam, ‘Materials Science’ Anuradha publications, Kumbakonam, (2006).
3. Palanisamy P.K, ‘Materials science’, Scitech publications(India) Pvt. LTd., Chennai, second Edition(2007)
4. Rajendran, V, and Marikani A, ‘Materials science’ TMH publications, (2004) New delhi.
5. Jayakumar, S. ‘Materials science’, R.K. Publishers, Coimbatore, (2008).

EE1153 - 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 12

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.

UNIT II ELECTRICAL MACHINES 12

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

UNIT III SEMICONDUCTOR DEVICES AND APPLICATIONS 12

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 Small Signal Amplifier.

UNIT IV DIGITAL ELECTRONICS 12

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

UNIT V FUNDAMENTALS OF COMMUNICATION ENGINEERING 12

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

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

Total : 60

TEXT BOOKS

1. V.N. Mittle "Basic Electrical Engineering", TMH Edition, New Delhi, 1990.
2. R.S. Sedha, "Applied Electronics" S. Chand and Co., 2006.

REFERENCES

1. Muthusubramanian R, Salivahanan S and Muraleedharan K A, "Basic Electrical, Electronics and Computer Engineering", TMH, Second Edition, (2006).
2. Nagsarkar T K and Sukhija M S, "Basics of Electrical Engineering", Oxford press (2005).
3. Mehta V K, "Principles of Electronics", S.Chand and Company Ltd, (1994).
4. Mahmood Nahvi and Joseph A. Edminister, "Electric Circuits", Schaum' Outline Series, McGraw Hill, (2002).
5. Premkumar N, "Basic Electrical Engineering", Anuradha Publishers, (2003).

MV1151 - MARINE ENGINEERING THERMODYNAMICS

L	T	P	C
4	0	0	4

UNIT I BASIC CONCEPTS AND FIRST LAW OF THERMODYNAMICS 12

Thermodynamic systems, concepts of continuum, thermodynamic properties, equilibrium, processes, cycle, work, heat, temperature, Zeroth law of thermodynamics. First law of thermodynamics – applications to closed and open systems, internal energy, specific heats, enthalpy,. – applications to steady and unsteady flow conditions.

UNIT II BASIC CONCEPTS OF SECOND LAW OF THERMODYNAMICS 12

Thermodynamic systems, Second law of thermodynamics Statements, Reversibility, causes of irreversibility, Carnot cycle, reversed Carnot cycle, heat engines, refrigerators, and heat pumps. Clausius inequality, entropy, principles of increase in entropy, Carnot theorem, available energy, availability.

UNIT III FLUID CYCLES 12

Thermo dynamic properties of pure substances, property diagram, PVT surface of water and other substances, calculation of properties, first law and second law analysis using tables and charts,

UNIT IV GAS POWER CYCLES 12

properties of ideal and real gases, equation of state, gas laws. Gas power cycles – Carnot, Otto, Diesel, Dual, Brayton, Ericsson, Sterling, Lenoir, Atkinson Cycles.

UNIT V THERMODYNAMIC RELATIONS AND COMBUSTION OF FUELS 12

Exact differentials, T-D diagrams, Maxwell relations, Clasius Claperon Equations, Joule-Thomson coefficients. Heat value of fuels, Combustion equations, Theoretical and excess air, Air fuel ratio and Exhaust gas analysis

Total : 60 Periods

TEXT BOOKS

1. Nag, P.K., "Engineering Thermodynamics", 1st Edition, Tata McGraw-Hill Publishing Company Limited New Delhi, 1993.
2. Russel, "Engineering Thermodynamics", 1st Edition, Oxford University Press, 2007

REFERENCES

1. Holmann, "Thermodynamics", 4th Edition, McGraw-Hill Book Company,New York,1888.
2. Rao, Y.V.C., "Thermodynamics",4th Edition,Wiley Eastern Ltd.,New Delhi,1993.

CE1151 - ENGINEERING MECHANICS

(For all Non-Circuit Branches)

L	T	P	C
3	1	0	4

UNIT I BASICS AND STATICS OF PARTICLES 12

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.

UNIT II EQUILIBRIUM OF RIGID BODIES 12

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

UNIT III PROPERTIES OF SURFACES AND SOLIDS 12

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 – Rectangle, triangle, circle from integration – T section, I section, Angle section, Hollow section by using standard formula – Parallel axis theorem and perpendicular axis theorem – Polar moment of inertia – Principal moments of inertia of plane areas – Principal axes of inertia – Mass moment of inertia – Derivation of mass moment of inertia for rectangular section, prism, sphere from first principle – Relation to area moments of inertia.

UNIT IV DYNAMICS OF PARTICLES 12

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.

UNIT V FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS 12

Frictional force – Laws of Coloumb friction – simple contact friction – Rolling resistance – Belt friction.

Translation and Rotation of Rigid Bodies – Velocity and acceleration – General Plane motion.

Total: 60

TEXT BOOKS

1. Irving H. Shames, "Engineering Mechanics – Statics and Dynamics", IV Edition – Pearson Education Asia Pvt. Ltd., (2003).
2. M.V Seshagiri Rao and D Rama Durgaiah, ' Engineering Mechanics" University Press 2005

REFERENCES

1. Beer, F.P and Johnson Jr. E.R. "Vector Mechanics for Engineers", Vol. 1 Statics and Vol. 2 Dynamics, McGraw-Hill International Edition, (1997).
2. Hibbeller, R.C., "Engineering Mechanics", Vol. 1 Statics, Vol. 2 Dynamics, Pearson Education Asia Pvt. Ltd., (2000).
3. K V Natarajan, 'Engineering Mechanics', Dhanalakshmi Publishers, Chennai 2006
4. Palanichamy, M.S., Nagam, S., "Engineering Mechanics – Statics and Dynamics", Tata McGraw-Hill, (2001).
5. Ashok Gupta, "Interactive Engineering Mechanics – Statics – A Virtual Tutor (CDROM)", Pearson Education Asia Pvt., Ltd., (2002).

CS1151 - COMPUTER PRACTICE LABORATORY II

L	T	P	C
0	1	2	2

LIST OF EXPERIMENTS

1	**UNIX COMMANDS** Study of Unix OS - Basic Shell Commands - Unix Editor	**15**
2	**SHELL PROGRAMMING** Simple Shell program - Conditional Statements - Testing and Loops	**15**
3	**C PROGRAMMING ON UNIX** Dynamic Storage Allocation-Pointers-Functions-File Handling	**15**

Total : 45

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

HS1154 - PHYSICS AND CHEMISTRY LABORATORY II

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.
7. Torsional pendulum – Determination of rigidity modulus.

CHEMISTRY LABORATORY II

L	T	P	C
0	0	3	2

LIST OF EXPERIMENTS

1. Conductometric Titration (Simple acid base)
2. Conductometric Titration (Mixture of weak and strong acids)
3. Conductometric 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 and 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.**

ME1151 - 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 Bspline or cubic spline.
4. Drawing of front view and top view of simple solids like prism, pyramid, cylinder, 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 multi-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:

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

ME1152 - WORKSHOP FITTING

L	T	P	C
0	0	3	2

AIM

To impart knowledge on the Fitting methods of Metal joining Process

OBJECTIVES

On Completion of the Course The Students are expected to have the Knowledge of Metal Cutting and Joining Process Tools and equipments used in Smithy, Carpentry, Fitting, Foundry, Welding and Sheet Metal.

LIST OF EXPERIMENTS

SHEET METAL

Fabrication of tray, cone etc. with sheet metal.

WELDING

Arc Welding of butt joint, Lap joint, Tee fillet etc. Demonstration of gas welding.

FITTING

Practice in chipping, filing, drilling – Making Vee, square and dove tail joints.

Total: 90 Periods

REFERENCES

0. V.S.Venkatachalapathy, First Year Engineering Workshop Practice, Raamalinga Publications, Madurai, 1999.
2. P.Kannaiah and K.C.Narayana, Manual on Workshop Practice, Scitech Publications, Chennai, 1999.

HS1155 - ENGLISH LANGUAGE LABORATORY (Optional)

L	T	P	C
0	0	2	-

1. Listening: **5**

Listening and answering questions – gap filling – Listening and Note taking- Listening to telephone conversations

2. Speaking: **5**

Pronouncing words and sentences correctly – word stress – Conversation practice.

Classroom Session **20**

1. Speaking: Introducing oneself, Introducing others, Role play, Debate- Presentations: Body language, gestures, postures.
   Group Discussions etc

2. Goal setting – interviews – stress time management – situational reasons
   Evaluation

(1) Lab Session – 40 marks

Listening	– 10 marks
Speaking	– 10 marks
Reading	– 10 marks
Writing	– 10 marks

(2) Classroom Session – 60 marks

Role play activities giving real life context	– 30 marks
Presentation	– 30 marks

Note on Evaluation

1. Examples for role play situations:
   a. Marketing engineer convincing a customer to buy his product.
   b. Telephone conversation – Fixing an official appointment / Enquiry on availability of flight or train tickets / placing an order. etc.

2. Presentations could be just a Minute (JAM activity) or an Extempore on simple topics or visuals could be provided and students could be asked to talk about it.

REFERENCES

1. Hartley, Peter, Group Communication, London: Routledge, (2004).
2. Doff, Adrian and Christopher Jones, Language in Use – (Intermediate level), Cambridge University Press, (1994).
3. Gammidge, Mick, Speaking Extra – A resource book of multi-level skills activities , Cambridge University Press, (2004).
4. Craven, Miles, Listening Extra - A resource book of multi-level skills activities, Cambridge, Cambridge University Press, (2004).
5. Naterop, Jean and Rod Revell, Telephoning in English, Cambridge University Press, (1987).

LAB REQUIREMENTS

1. Teacher – Console and systems for students
2. English Language Lab Software
3. Tape Recorders.