Course Structure

and

Detailed Syllabus

for

1st and 2nd Semester Bachelor of Technology

2013-14



राष्ट्रीय प्रौद्योगिकी संस्थान पटना

NATIONAL INSTITUTE OF TECHNOLOGY PATNA

PATNA 800005, BIHAR

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CREDIT C	OF A SUBJECT IN SEMESTER & ITS PERCENTAGE CONTRIBUTION					

Prog	SI. No.	Sem	Code	Course Title	TH/ PT	L	т	Р	Credits				
	Group – A (1 st Sem)												
GR_A	1	1	GE101	PARICHAY ¹	PT	0	0	1	0				
GR_A	2	1	HS101	English Literature ²	TH	2	1	0	3				
GR_A	3	1	MA101	Engineering Mathematics – I	TH	3	1	0	4				
GR_A	4	1	PH101	Engineering Physics	TH	3	1	0	4				
GR_A	5	1	PH102	Engineering Physics Lab	PT	0	0	3	1				
GR_A	6	1	CS101	Introduction to Computing	TH	2	1	0	3				
GR_A	7	1	CS102	Computing Lab	PT	0	0	3	1				
GR_A	8	1	EE101	Elements of Electrical Engg	TH	3	1	0	4				
GR_A	9	1	EE102	Elements of Electrical Engg Lab	PT	0	0	3	1				
GR_A	10	1	ME102	Workshop Practice	PT	0	0	3	1				
						14	4	13	22				
				Group – A (2 nd Sem)									
GR_A	1	2	HS102	Communication Skill Development & Technical Writing	PT	0	1	3	2				
GR_A	2	2	MA102	Engineering Mathematics –II	TH	3	1	0	4				
GR_A	3	2	CH101	Chemical Science	TH	3	0	0	3				
GR_A	4	2	CH102	Chemical Science Lab	PT	0	0	3	1				
GR_A	5	2	HS105	Science, Society & Ethical Values	TH	1	1	0	2				
GR_A	6	2	CE101	Engineering Mechanics	TH	3	1	0	4				
GR_A	7	2	EC101	Elements of Electronics Engg	TH	3	1	0	4				
GR_A	8	2	EC102	Elements of Electronics Engg Lab	PT	0	0	3	1				
GR_A	9	2	ME101	Engineering Graphics	PT	1	0	3	2				
						15	4	12	23				

COMMON CURRICULA FOR 1st & 2nd SEMESTER OF B. TECH PROGRAM

² In First Year the HSS department faculties are required to evaluate student's proficiency in English communication. If Communication Skill (Spoken and Written) of the students is found to be below normal standard, then all such students shall be offered following course in lieu of English Literature (HS101) in that semester as detailed below:

Prog	Sem	Code	Course Title	TH/ PT	L	Т	Р	Credits
GR_A/ B/ ARUG	1 or 2	HS103	Remedial English	TH	2	0	0	2
	1012	HS104	Language Lab	PT	0	0	3	1

¹ In First semester PARICHAY program shall be conducted in each section for 1st two weeks of admission

Prog	SI. No.	Sem	Code	Course Title		L	Т	Ρ	Credits				
	Group- B (1 st Sem)												
GR_B	1	1	GE101	PARICHAY	PT	0	0	1	0				
GR_B	2	1	HS102	Communication Skill Development & Technical Writing	PT	0	1	3	2				
GR_B	3	2	MA102	Engineering Mathematics -II	TH	3	1	0	4				
GR_B	4	2	CH101	Chemical Science	TH	3	0	0	3				
GR_B	5	2	CH102	Chemical Science Lab	PT	0	0	3	1				
GR_B	6	2	HS105	Science, Society & Ethical Values	TH	1	1	0	2				
GR_B	7	2	CE101	Engineering Mechanics	TH	3	1	0	4				
GR_B	8	2	EC101	Elements of Electronics Engg	TH	3	1	0	4				
GR_B	9	2	EC102	Elements of Electronics Engg Lab	PT	0	0	3	1				
GR_B	10	2	ME101	Engineering Graphics	PT	1	0	3	2				
						15	4	13	23				
				Group- B (2 nd Sem)									
GR_B	1	2	HS101	English Literature	TH	2	1	0	3				
GR_B	2	2	MA102	Engineering Mathematics –II	TH	3	1	0	4				
GR_B	3	2	PH101	Engineering Physics- I	TH	3	1	0	4				
GR_B	4	2	PH102	Engineering Physics- I Lab	PT	0	0	3	1				
GR_B	5	2	CS101	Introduction to Computing	TH	2	1	0	3				
GR_B	6	2	CS102	Computing Lab	PT	0	0	3	1				
GR_B	7	2	EE101	Elements Of Electrical Engg	TH	3	1	0	4				
GR_B	8	2	EE102	Elements Of Electrical Engg Lab	PT	0	0	3	1				
GR_B	9	2	ME102	Workshop Practice	PT	0	0	3	1				
					14	4	12	22					

Note:

- First and Second semester courses have been divided in two groups: Group A and Group B. Any set of student of any branch is offered Group A of 1st semester then same set of students will be offered Group A of 2nd Semester; likewise set of students of any branch is offered Group B of 1st semester then they will be offered Group B of 2nd semester.
- **Group A**: Electrical Engineering, Civil Engineering and Mechanical Engineering (for re-admitted students).
- **Group B**: Electronics & Communication Engineering, Computer Sc. & Engineering and Information Technology (for readmitted students).
- In Course Code column 'x' represents Semester Code to be substituted by the department based of subject being offered either in 1st or 2nd Semester.

MA101 Mathematics – I

L-T-P: 3-1-0

Matrix Algebra:

Elementary row & column transformation, Inverse of the matrix, Cannonical form, Reduction to Canonical form, rank of the matrix, solution of simultaneous linear equations, characteristic equation, eigen values & eigen vectors, Caley-Hamilton theorem, Similarity transformation

Differential Calculus:

Successive differentiation, Leibnitz theorem, indeterminate form, Limit, continuity and differentiability of functions of several variables, partial derivatives and their geometrical interpretation, differentials, derivatives of composite and implicit functions, derivatives of higher order and their commutatively, Euler s theorem on homogeneous functions, harmonic functions, Taylor s expansion of functions of two variables, maxima and minima of functions of two variables, Lagrange s method of multipliers

Differential equation:

Ordinary Differential Equations: First order differential equations - separable variable, homogeneous, exact, linear and Bernoulli s form. Second and higher order differential equations with constant coefficients, method of variation of parameters, Euler s equations, system of linear differential equations

12 lectures

Infinite Series:

Notion of convergence and divergence of infinite series – Ratio test, comparison test, Raabe's test, Root test, alternating series – Leibnitz test, absolute and conditional convergence, Power series.

8 lectures

Text Books:

- 1. Advance Engineering Mathematics R. K. Jain & S.R.K. Iyenger, Narosa Publishing House
- 2. Differential Calculus Das & Mukherjee U.N. Dhar & Sons.
- 3. Advance Engineering Mathematics E. Kreyszig, 8th Edition, John Wiley & Sons, New York

Reference Books:

- Advance Engineering Mathematics Wylie & Barrett Tata McCraw Hill
- 2. Linear Algebra K. Hoffmann and R. Kunze Prentice Hall

Mathematics – II MA102

Integral Calculus

Convergence of improper integrals - comparison test, Beta & Gamma functions (definition & related problems), differentiation under integral sign – Leibnitz rule,

Double & Triple integrals, Change of Variables in double integrals, Computation of surfaces & volumes, Rectifications, Jacobians of Transformations. 12 lectures

Vector Calculus:

Scalar & Vector field, level surface, directional derivatives, concept of gradient, divergence & curl with examples, line integral, Green's theorem in plane, Gauss & Stroke's theorem with applications.

10 lectures

L-T-P-Cr: 3-1-0-4 Credit: 4

10 lectures

12 lectures

L-T-P-Cr: 3-1-0-4

Complex Analysis:

Function of complex variables – limit, continuity, differentiability and analyticity of functions, Cauchy-Riemann equations, Laplace's equation, harmonic function, Cauchy's integral theorem, Cauchy's integral formula, Taylor's and Laurent series, Residues and its applications to evaluating real integrals. **12 lectures**

Probability and Statistics:

Random Variable – cummulative distribution function, probability mass function, probability density function, mathematical expectation, mean, variance. **8 lectures**

Text Books:

- 1. Advance Engineering Mathematics R. K. Jain & S.R.K. Iyenger, Narosa Publishing House
- 2. Advance Engineering Mathematics E. Kreyszig, 8th Edition, John Wiley & Sons, New York

Reference Books:

- 1. Advance Engineering Mathematics Wylie & Barrett Tata McGraw Hill
- 2. Complex Variables and Applications Churchill & Brown McGraw Hill
- 3. Vector Analysis 2nd editions Chatterjee, Prentice Hall of India
- 4. Introduction to Probability & Statistics for Engineers S. M. Ross John Wiley and Sons, New York

CH101 Chemical Sciences

L-T-P-Cr: 3-1-0-4

Unit 1 Chemical bonding

Ionic bonding, Factors which governs ionic bonding. Lattice energy, Born -Haber cycle. Covalent bond Hybridisation, VSPER theory, bond order, bonding in coordination compounds .Molecular orbital theory of homo- and hetero-nuclear diatomic molecules. Bonding in coordination compound, Ligand field theory and crystal field theory. (6 Lecture)

Unit 2 Stereochemistry

Stereoisomerism, optical activity, geometrical isomerism, enantiomers, diastereomers, optical activity without asymmetric carbon atom. Conformational isomerism. Geometrical and optical isomerism in coordination compounds. (8 Lecture)

Unit 3 Electrochemistry

Ionic conductivity and its measurements. Conductivity of electrolytes, Kohlrauschs law. Galvanic cell, electrode potential, Nernst equation, galvanic series, Fuel cells. (6 Lecture)

Unit 4 Gases

Kinetic theory of gases, kinetic gas equation, most probable velocity, average velocity, root- meansquare velocity, Vander-Walls gas equation. Liquefaction of gases(6 Lecture)

Unit 5 Chemical kinetics

Reaction rates, order of reaction, molecular of reaction, first and second order reaction, pseudoorder reaction. Reversible reaction, consecutive reactions and parallel reaction. Homogeneous and heterogeneous catalysts and its applications in chemical industries. **(8 Lecture)**

Unit 6 Chemical thermodynamics

Reference Books:

change as reversible and irreversible process, Gibbs hemholtz equation.

First law : statement, work done in isothermal, adiabatic, conditions work and heat path dependent function, heat changes, isochoric and isobaric conditions, heat capacity, C_p and C_v relations, Kirchoffs relation. Second Law: Need of 2nd Law, spontaneous process, Reversible process, Carnot cycle, Concept of energy, Entropy changes as function of temperature, entropy changes during the phase transformation, Gibbs free energy, free energy changes under various conditions, free energy

CH102 Industrial Chemistry

Unit 1 Water treatment

Hardness of water, units of water, disadvantage of hard water, scale and sludge formation in boilers, caustic- embrittlement , boiler corrosion. Priming and foaming in boilers, softening methods. Desalination of Brackish water. (6 Lecture)

Unit 2 Fuels

Text Books:

Classification of fuels, calorific value, classification of coal, Analysis of coal. Proximate and ultimate analysis and their significance. Carbonization of coal. Petroleum cracking, reforming, synthetic petrol, knocking in petrol and diesel engines. Additives used to improve the quality of fuels (gasoline and diesel). Natural gas, water gas producer gas. Combustion calculations, Non-conventional sources of energy, fuel cells, solar energy, wind energy and bio-diesels. **(8 Lecture)**

Unit 3 Ceramics and refractory

Materials used as ceramics, requirement of good refractories, manufacture of refractories. Classification properties of refractories and selection of refractories. Composition of glass and cement, setting of cement. (6 Lecture)

Unit 4 Polymers

Polymers, reaction and mechanism of polymerization. Preparation of some commercially important polymers (fibers, elastomers, adhesives and plastics). Engineering uses of polymeric materials.

(6 Lecture)

Unit 5 Corrosion and corrosion control

Law of dry corrosion (Parabolic law, linear law and logarithmic law), wet corrosion (Electrochemical theory). Factors influencing corrosion, types of corrosion: drop corrosion, crevice corrosion, deposit corrosion, water-line corrosion, stray current corrosion, stress corrosion, pitting and erosion corrosion. Protective measures against corrosion by (i) modification of environment (ii) modification of the properties of the metal (iii) use of protective coatings and (iv) cathodic protection.

(7 Lecture)

Unit 6 Explosive and propellants

Explosive, classification of explosives, oxygen balance, preparation and application explosive, precautions using storage of explosives. Blasting fuses, roekel propellants, properties and classification of propellants. (6 Lecture)

Text Books:

L-T-P-Cr: 3-1-0-4

(8 Lecture)

Reference Books:

Engineering Mechanics CE101

Module -I

 Statics: Force systems: Moment of a force about a point and about an axis; Equivalent forces and moment, Wrench. [6 Lectures] Equilibrium: Free body diagram; equations of equilibrium; problems in two and three dimensions; Supports and reactions [3 Lectures] Method of sections for evaluating internal forces in bodies; axial force, shear and bending moment diagrams: [3 Lectures] Trusses and frames [3 Lectures] Module –II Friction: Laws of Coulomb friction, impending motion problems involving large and small contact surfaces [3 Lectures] Principle of virtual work [3 Lectures] Principle of virtual work [3 Lectures] Module -III Dynamics: Kinematics and Kinetics of particles: Particle dynamics in rectangular coordinates cylindrical coordinates and in terms of path variables. [4 Lectures] Kinematics and Kinetics of figid bodies: Chasle's Theorem; General Plane motion; D' Alembert's Principal, Work & Energy and Impulse Momentum methods, Impact. [6 Lectures] Module - IV Simple Stress and Strain, Hook's Law [2 Lectures] Analysis of stresses, Equilibrium Equations, Generalized Hook's Law, Elastic constants [3 Lectures] Analysis of strains, Normal and Shear Strains, Volumetric Strain [3 Lectures] Analysis of strains, Normal and Shear Strains, Volumetric Strain [3 Lectures] Analysis of Strains, Normal and Gree, McGraw Hill, New Delhi Engineering Mechanics by Shames, Pearson's Education. Mechanics of Engineers, Beer, F.P. and Johnston, Tata McGraw Hill, New Delhi Engineering Mechanics, McGraw Hill Inc. CSIO1 Introduction to Computing L-T-P-Cr: 2-1-0-3 Introduction to Programming, Algorithms and Flow Chart 1 Generation of programming languages, steps involved in Problem Solving, Algorithm, Flow chat, Pseudo code <!--</th--><th></th><th></th><th></th>			
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Introduction to Programming, Algorithms and Flow Chart1 hourGeneration of programming languages, steps involved in Problem Solving, Algorithm, Flow chat, Pseudo code		L-T-F	P-Cr: 2-1-0-3
Generation of programming languages, steps involved in Problem Solving, Algorithm, Flow chat, Pseudo code	Intro	duction to Programming, Algorithms and Flow Chart	L hour
	Gene Pseud	eration of programming languages, steps involved in Problem Solving, Algorithm, do code	Flow chat,

A Simple C program, Header files, data types and sizes, Constants, variables, token, identifiers, Operators: arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bit-wise operators, assignment operators; expressions, L-value, r-value, type

L-T-P-Cr: 3-1-0-4

Basics of C

Control Statements

Conditional control statement-if, if-else, nested-if, switch; Go-to-statement; Looping-while, dowhile, for, nested for; jumps in loops—break and continue statement

conversions, conditional expressions, precedence and order of evaluation, data type conversion,

mixed- mode operation, Managing Input and Output operation (formatted and unformatted)

Arrays

Definition, one-dimensional arrays-declaration and initialization, two-dimensional arrays, multidimensional arrays, dynamic arrays

Strings

Introduction, Declaring and initializing strings, reading and writing strings, String Handling Function, Implementation of string functions, Arithmetic operation on strings, comparison of Strings

Functions

Function definition, arguments and parameters, categories of function, scope and extent, Storage classes, static and register variables, parameter passing mechanism, Inline function, nesting of function, recursion, passing arrays to function, passing strings to function, variable length argument list.

Pointers

Understanding memory address, declaring and initializing pointer variables, void pointer, null pointer, accessing a variable through pointer, array and pointer, pointer and string, pointer as function arguments, Pointer arithmetic, pointers to pointer, function returning pointer, pointers and structure, Dynamic memory allocation (Malloc, Calloc, releasing the used space, Realloc), Memory leak and memory corruption.

User defined data Types:

Structure- defining, declaring, initializing; accessing structure members, processing of structure , array of structures, structures within structure, structure and function, type definition; Uniondefinition, declaration, accessing union members, initializing union

Pre-processor

Introduction, macro substitution, File Inclusion, Compiler control Directives

Files

Introduction, file declaration, opening and closing a file, working with text and binary files, I/O operations on file, error handling, random access to files

Graphics programming

Introduction, Command line argument, function used in graphics, drawing shapes, designing using graphics

Text Books:

1. Programming in C by Pradip Dey and Manas Ghosh, Oxford

References:

- 1. Programming in C by Ashok kamthane, Pearson Education
- 2. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.
- E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill. 3.

4 hours

4 hours

9 hours

4 hours

1 hours

4 hours

3 hours

3 hours

3 hours

4. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.

- 5. Practical C Programming (3rd Edition) by Steve Oualline, O'reilly Press
- 6. C: The Complete Reference by Herbert Schildt, TMH

EC101 Elements of Electronics Engineering

Module1. Semiconductor Diodes

- Semiconductor materials- intrinsic and extrinsic types
- Ideal Diode
- Terminal characteristics of diodes:
 - p-n junction under open circuit condition
 - p-n junction under forward bias and reverse bias conditions
 - p-n junction in breakdown region
- Diode small signal model
- Zener diode and applications
- Rectifier Circuits
- Clipping and Clamping circuits

Module2. Bipolar Junction Transistors (BJTs)

- Physical structure and operation modes
- Active region operation of transistor
- D.C. analysis of transistor circuits
- Transistor as an amplifier
- Biasing the BJT: fixed bias, emitter feedback bias, collector feedback bias and voltage divider bias
- Basic BJT amplifier configuration: common emitter, common base and common collector amplifiers
- Transistor as a switch: cut-off and saturation modes
- High frequency model of BJT amplifier

Module 3. Field Effect Transistor (FET)

- Enhancement-type MOSFET: structure and physical operation, current-voltage characteristics
- Depletion-type MOSFET
- D.C. operation of MOSFET circuits
- MOSFET as an amplifier
- Biasing in MOSFET amplifiers
- Basic MOSFET amplifier configuration: common source, common gate and common drain types
- High frequency model of MOSFET amplifier
- Junction Field-Effect Transistor (JFET)

Module 4. Operation Amplifier (Op-amps)

- Ideal Op-amp, CMRR and its applications as Differential amplifier
- Practical op-amp circuits: inverting amplifier, non -inverting amplifier, weighted summer, integrator, differentiator, Active Filter (2nd Order)

Module 5. Logic circuits and Applications

- Logic gates and circuit,
- Logic circuit implementation using diodes and transistors

L-T-P-Cr: 3-1-0-4 (6 Lectures)

(4 Lectures)

(8 Lectures)

(5 Lectures)

.

(5 Lectures)

- Combinational logic Circuit
- SOP and POS, Minimization Techniques

Module 6. Sequential Circuit

- Sequential Logic Design: Latches and Flip flops
- Flip-flops: RS- FF, JK-FF, D- FF and T- FF
- Counters, Multiplexor and De-multiplexor

Module 7. Analog Communication

- Basics of Communication system (AM, FM, PM)
- Demodulation Circuits

Text Book:

1. "Electronic Devices and Circuit Theory", Nashelesky & Boylestead, PHI/Low price edition.

Reference Books:

- 1. "Microelectronic Circuits", Sedra and Smith
- 2. "Microelectronics", Millman & Gabrial, McGraw Hill
- 3. "The Art of Electronics", Paul Horowitz and Winfield Hill, Cambridge University Press
- 4. Digital Electronics Morris Mano
- 5. Digital System Flecher

EE101 Elements of Electrical Engineering

L-T-P-Cr: 3-1-0-4

- Introduction: D.C. circuits steady state analysis with independent and dependent sources using Loop and node voltage method, Series and parallel circuits, star delta conversion, Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum Power Transfer Theorem.
 10 Lectures
- A.C. circuits: Common signals and there waveform, RMS and Average value, form factor and peak factor of sinusoidal wave, Impedance of series and parallel circuits, Phasor diagram, Power, Power factor, Power Triangle, Resonance and Q-factor, Superposition, Thevenin's and Norton's Maximum Power transfer theorem for A.C. circuits.
- A.C. circuits 3-phase: Star delta, line and phase relation, Power relations, Analysis of balanced and unbalanced 3-phase circuits.
 4 Lectures
- Magnetic circuits: Introduction, Series & Parallel magnetic circuits, B-H Curve under A.C. excitation, Eddy current and hysteresis losses.
 3 Lectures
- **5.** DC Machines Types, Construction, Operating principle of dc generator and motor, commutator, characteristics of dc motors, starters for dc series and shunt motors.

6 Lectures

- Single Phase Transformer Types, construction, operating principle, EMF equation, Turn ration losses and efficiency, Auto transformer
 5 Lectures
- 7. A. C. Motor: Introduction to three phase Induction Motor and starters for Induction Motor 4 Lectures

Text Books:

2. Basic Electrical Engineering by Fitzerald, etal, Tata McGraw Hill

Page 11

(10 Lectures)

(4 Lectures)

Reference Books:

- 1. Fundamentals of Electrical Engg. By Leonard S. Bobrow, Oxford
- 2. Fundamentals of Electrical Engineering by R. Prasad, PHI Publication

HS101 English Literature

L-T-P-Cr: 2-1-0-3

The primary objective of the English literature Course which is being offered to students having a fair knowledge of English and a study of literature will enhance their flair in written and verbal expression.

The recommended any one novels will be covered as described below:

28 Lectures

1. Oliver Twist – Charles Dickens

- (a) Discussion of the Victorian age in English fiction and the role of Charles Dickens as a novelist during this period.
- (b) Introduction to Charles Dickens his life and works.
- (c) Oliver Twist as a criticism of the industrial Age.
- (d) Oliver Twist as an analysis of Victorian poverty and condition of children.
- (e) Discussion of the Art of Plot and Characterization.

2. Julius Caesar – William Shakespeare

- (a) Introduction to the author.
- (b) A discussion of the socio political structure of the 20th century Europe up to the rise of Communism and World War 2.
- (c) Animal Farm as a political satire.
- (d) Satire and Fable.
- (e) Animal Farm as a fusion of Political purpose and artistic vision of the author.

3. Julius Caesar – William Shakespeare

- (a) Life of Shakespeare.
- (b) Shakespeare as a Dramatist.
- (c) Synopsis of the play.
- (d) Justification of the title of the play.
- (e) Theme of the play.
- (f) Fate as the Hero of "Julius Caesar".
- (g) Superstitions in Julius Caesar.
- (h) Caesar as a Marlowean Hero.
- (i) Characters: Julius Caesar, Mark Antony, Marcus Brutus, Cassio.
- (j) Shakespeare's conception of tragedy.

4. Macbeth – William Shakespeare

- (a) Introduction to William Shakespeare and Historical introduction to Elizabethan and Jacobean periods.
- (b) The play as a tragedy.
- (c) Definition of tragedy as in Aristotle and its application to Elizabethan tragedies.
- (d) Analysis of its plot structure.
- (e) Analysis of major characters such as Macbeth, Lady Macbeth and Banquo.
- (f) The Elements of supernatural in the play Macbeth.
- (g) The role of the Witches in the play.

(h) An analysis of figures of speech, poetic imagery and various dramatic conventions in the play.

Text book (Novel)

- 1. Oliver Twist Charles Dickens
- 2. Animal farm George Orwell
- 3. Julius Caesar William Shakespeare
- 4. Macbeth William Shakespeare

HS102 Communication skill development and Technical Writing

L-T-P-Cr: 0-1-3-2

The primary objective of Course which is being offered to students is for Communication skill development and technical writing. The course is aimed at providing the students with language wherewithal which is an inescapable tool for the young technocrats to break the geographical boundaries and step into the global village.

9 Lectures

1. Communicative: What is Communication? Theory: Importance of Communication: Process of Communication:

- (i) Verbal
- (ii) Non-verbal

Practical:

- (a) How to face an interview
- (b) Group Discussion
- (c) How should the Interviewer Plan & conduct the Interview.
- (d) Body Language & Gesture
- (e) Eye Contact
- (f) Appearance
- 2. Listening: Its importance & Barriers to listening

Theory:

- (a) Listening
- (b) Developing Reading Skills
- (c) Developing Conversational skills

English in Formal situations

- (i) Interview
- (ii) At the Bank
- (iii) At the Airport
- (iv) At the police station
- (v) Customer Care
- (vi) At the Embassy

English in informal Situations

- (i) At a dinner party
- (ii) Booking a room at a hotel
- (iii) At a travel agency
- (iv) At the hospital
- (v) Ask for a opinion

12 Lectures

3. Technical Writing

Text Books:

- 1. Sreevalsan, MC; Spoken English, Vikash Publishing House, New Delhi.
- 2. Communication Skills; Sanjay Kumar, Pushphate, Oxford.
- 3. English for Engineers & Technologists, Orient Blackswan, ELT.
- 4. Krishna Mohan & N P Singh Speaking English Effectively.
- 5. Krishna Mohan, Meera Banarjee, Developing Communication Skills.
- 6. Frank O' Connor, Phonetics, Pengiun.
- 7. Business Correspondence & Report Writing- Sharma & Krishna Mohan- Tata Mgraw.

Reference Books:

1. Sardanand K, Teaching, Listening & Speaking (With Audio CD), Orient Blackswan, Hyderabad.

HS103 Remedial English

L-T-P-Cr: 2-0-0-2

The primary objective of the Course detailed for Remedial English is being offered to students weak in language who will benefit in their language skill since the syllabus is supported by the language Lab.

1. **Basic Grammar - Structural Pattern** 6 Lectures (a) Articles (b) Verbs: Auxiliaries, Finite & Non Finites. Time and Tense (c) Subject: Verb Agreement (concord). (d) (e) Active & Passive Voice. (f) Narration 2. (i) Single word / verb substitution 6 Lectures (ii) Editing 3. Common Error, Comparison **3** Lectures 4. Antonym, homonym, Sentence, Building (Vocabulary) **5** Lectures 5. Précis, Essay, Paragraph Writing & Comprehension 4 Lectures 6. Official Correspondence, Memorandum; Circular Letter 4 Lectures

Text Books:

- 1. English Grammar- N.D. Turton, ABC of Common Grammatical Error for learners & Teachers.
- 2. English Grammar- Dr. D. Thakur
- 3. English Grammar- Dr. K.K. Ramchandran etal; business Communication.
- 4. Technical English- Sharon j Gerson and Steven M Gerson
- 5. Angela Burt, Quick Solutions to common Error in English.
- 6. W. Foulsham, The Complete letter writer.
- 7. John East wood- Oxford guide to English Grammar.

Reference Books:

- 1. Communication in English for Technical Student- Orient Longman.
- 2. G. Nagroj, English Language Teaching.
- 3. N. Saraswati, English language Teaching; principles & practices.
- 4. English for Engineers- Orient Blackswan

The primary objective of the Course detailed for Remedial English is being offered to students weak in language who will benefit in their language skill since the syllabus is supported by the language Lab.

(i)	Phonet	10 Lectures	
	(a)	nants)	
	(b)	Stress, Rythm, Pitch & Intonation, Accent.	
(ii)	English	4 Lectures	
	(a) (b) (c) (d)	Greetings Making a Telephone Call Making apology At college	
(iii)	English	in formal situation	4 Lectures
	(a) (b) (c)	At the Doctor's Outside the class Introducing self and other	

HS105 Science Society and Ethical Values

L-T-P-Cr: 1-1-0-2

The primary objective of the Course detailed in the successive paragraphs for Science, Society & Ethical values is keeping in view the present day scenario an urgent need to introduce this subject as part of the class room curriculum was felt and hence included in the syllabus. The aim is to inculcate the right values during the period that a youngster is preparing to step into the professional world and still in the process of understanding the society and the relevance of science in the right perspective

Professional Ethics: Aim of Professionals, Responsibilities of Professionals, Right of Professionals, Impediments to responsibilities, Honesty, Integrity, Reliability, Risk, Safety and Liability, Global Issues.

Personal Ethics: Value of Self, Others and Society, Compliance with law, Social Norms.

Service to Community, Corruption, Indian and Western Culture, Simple living and high thinking, Science and Spirituality.

Reference Books:

- 1. Charles E. Harris et al, Engineering Ethics, Cengage, 2009
- 2. N. N. Das, Ethical Considerations.
- 3. Professional Ethics by R. Subramaniam, Oxford University Press

ME101 ENGINEERING GRAPHICS

- 1. Practice Set 1: Title Engineering Lettering & Dimensioning Practice:
- 2. Practice Set 2: Title Engineering Curves: Ellipse, Parabola, Hyperbola and Cycloid, Involutes, Archimedean spiral
- 3. Practice Set 3: Title Scales: Diagonal Scale, Vernier Scale, Scale of Chord.
- 4. Practice Set 4: Title Projection of Points and Straight Lines:
- 5. Practice Set 5: Title Projection of Planes and Solids:
- 6. Practice Set 6: Title Section of Solids and Surface Development:
- 7. Practice Set 7: Title Intersection of Surfaces:
- 8. Practice Set 8: Title Orthographic Views
- 9. Practice Set 9: Title Isometric Projections & Views
- 10. Practice Set 10: Title Elementary Engineering Graphics with AutoCAD.

Text Books:

- 1. Engineering Drawing with an Introdution to auto CAD- Dhananjay A Jolhe.(TMH)
- 2. Engineering Drawing –K. Venugopal & V. Prabhu Raja (New Age International)
- 3. Engineering Drawing N. D. Bhatt & V. M. Panchal (Charotar Publishing House Pvt)

Reference Books:

- 1. Engineering Drawing & Graphics using AutoCAD, T. Jeyapoovam (Vikash Pub)
- 2. Engineering Drawing (Geometrical Drawing) P. S. Gill
- 3. Engineering Drawing Agrawal & Agrawal (TMH)

ME102 Workshop Practice

L-T-P-Cr: 0-0-3-1

- 1. Study of tools used in Black Smithy Shop and making of (i) Eye nail (ii) Ring
- 2. Study of tools used in Carpentry Shop & making of (i) Half lap joint (ii) Dovetail joint & (iii) File handle.
- 3. Study of tools used in Fitting Shop and making of (i) Matching gauge (ii) Chipping & filing.
- 4. Study of different parts of Lathe machine and making of Taper Stud.
- 5. Study of tools used in Foundry Shop and making of (i) Stuffing gland box (ii) Vee block
- 6. Welding, Soldering & devices of Electric arc welding.

Test Book/ Reference Book:

- 1. Workshop technology -Hazra Chaudhary
- 2. Workshop technology- Raghubansi
- 3. Manual on workshop Practice- Kannaiah
- 4. Workshop manual- Kannaiah
- 5. Workshop Practice- Swarn Singh

Important sections of UG Curricula is being reproduced for reference

(Complete Curricula for the B. Tech & B. Arch Program is under final preparation for printing)

9.5 Minimum requirement for promotion to higher Semester and continue in the program (*Applicable to students admitted from session 2013-14*)³

- (i) All students admitted in B. Tech/ B. Arch Program form first semester can continue to second semester.
- (ii) A student should earn not less than the minimum credit threshold as stated in Table 9.5-1, at the end of the each year for registration to the higher semester, and he/ she must have passed minimum two courses from each semesters of course credit not less than 3 (three) each.

Table 9.5-1 Percentage Credit Threshold based on Total credit offered at the end ofeach year of B. Tech and B. Arch Program

Check Point	Credit Threshold at end of each year	Credit Threshold as per
		New Course Structure #
End of FIRST year	75% of 1st Yr credit	34
End of SECOND year	1st Yr Threshold Credit + 75% of 2nd Year Credit	64
End of THIRD year	2nd Yr Threshold credit +75% of 3rd Year Credit	96
End of FOURTH year (Only B. Arch)	3rd Yr Threshold Credit + 75% of 4th Year Credit	131

The data in the last Column of above table is as per present Course structure and may change if Course credit offered in different semesters is changed/ modified.

- (iii) If any student fails to satisfy the above minimum credit threshold requirement to continue in the programme, he/she shall be on academic probation for one year, during which he/she is allowed to register for all failed and debarred courses only to earn/ makeup the deficit credits during Odd/ Even Semester and Summer Quarter Semesters of the session.
- (iv) If any student wants to get readmitted i.e. attend all Courses of any Semester in next Session may be permitted, for improvement of CGPA.
- (v) At the end of the academic probation period, if any student still does not qualify/ earn credit threshold as per Table 9.5-1 to register for the higher semester, he/she has to discontinue from the programme.
- (vi) The credit requirements mentioned above does not include courses, which are Pass/ Fail courses and are not considered for CGPA calculations.
- (vii) A student must become eligible for award of degree in maximum period as detailed under section 12.12.

Note: The CGPA for a set of p subjects will be calculated as follows:

$$CGPA = \sum_{i=1}^{p} c_i g_i / \sum_{i=1}^{p} c_i$$

Where c_i is the number of credits allotted to a particular subject 'i' in the set, and g_i is the grade - point carried by the letter grade awarded to the student in that subject 'i'.

11.2 a) For arriving at a grade obtained by a student for a particular subject, initially a numeric marks obtained by the student out of Full marks is to be determined. For subjects where the laboratory component (P - component) is non-zero has separate full marks. The theory component (L & T - components) and the laboratory component are to be ascertained separately. Next the failure cases (that is, the cases of student obtaining 'F' grade) are to be determined as explained in *Appendix - VIII*. A composite percentage of marks of the course is then to be computed by taking appropriate contribution of theory component and

³ Amendments approved by 11th Senate applicable to students admitted from Session 2013-14 and onward. Students admitted during session 2011-12 and 2012-13 who do not get promotion under previous rule shall be governed by transitory rules.

the laboratory component as elucidated in *Appendix - VII*. Details of credit of a course based on Lecture, tutorial and practical (L-T-P) class per week and its weightage (Full Marks) for evaluation is detailed at *APPENDIX – VII*.

- b) Once the numeric mark is obtained, the same is to be converted to letter grade following the Guidelines given in *Appendix VIII*.
- c) For assigning mark in Class Assessment (C.A.) performance in home assignments, classtests, tutorials, viva-voce, attendance etc. are to be considered. At least two class tests are to be conducted for a subject. The weights of different subcomponents of C.A. are to be announced by the teacher at the beginning of the Semester. The subcomponent of evaluation and their respective weights assigned to are given below⁴.

Theory Evaluation	Subcomponents	Weighting factor				
<u>Components</u>						
Class Assessment	Class Attendance	10%				
(TH_CA)	Assignment/ Class Test- I	5%				
	Class Test- II	5%				
	Mid-Semester Exam.: 2 Hrs Duration	20%				
End-semester Examination of 3 Hours Duration (TH_ESM) 60%						

a) For assigning marks in the laboratory component (P - component) the relevant subcomponents that are to be considered are: day-to-day work, regularity, tests (at least two test must be conducted), assignment, viva-voce etc. percentage weight of the different subcomponents in deciding the final marks are to be announced at the beginning of the semester. The subcomponent of evaluation and their respective weights assigned to are given below.

Practical Evaluation	Subcomponent	Weighting factor			
Class Assessment	Class Attendance	10%			
(PT_CA)	Class performance	10%			
	Practical Repot	10%			
	Practical Internal Viva voce	10%			
End-semester Examination (PT_ESM) 60%					

- b) For course which has both theory as well as practical component i.e. Lecture plus tutorial (L+T) and P both are greater than 1 (one), then Theory and Practical component shall have a weightage may have different weightage (Refer Appendix VII). However the evaluation/ weights for subcomponent of theory and Practical components shall be as per above only.
- c) For Course which has theory and Practical component i.e. Lecture plus tutorial (L+T) is 1 (one), there would be no Mid- Semester or End-Examination. The marks of the theory component would be decided by performance in class-tests, home assignments, tutorials (if any); viva-voce, attendance etc. with the practical Components only. The evaluation/ weights of total course subcomponent shall be done in Practical component only. However in all such course attendance in theory Components shall be maintained separately and student are required to have minimum 75% attendance in theory and practical separately, to be able appear at End semester Exam. The announced by the teacher regarding distribution of marks must be made at the beginning of the semester.
- d) Marks for attendance for theory and practical course shall be as per following table⁵.

Attendance Up to 75%	No Marks (Minimum 75% attendance is mandatory to appear at End semester examination)
Attendance Above 75%	0.4 marks for every 1% of attendance above 75% or one marks for every 2.5% attendance above 75%

e) The evaluation procedure for Industrial Training/ Seminar/ Project/ Dissertation etc. is explained separately in following sections.

⁴ Amendments approved by 11th Senate applicable to Students admitted during session 2013-14 and thereafter. However earlier admitted students (been promoted to 2nd year) shall continue with earlier weighting factor only.

⁵ Amendments approved by 11th Senate applicable to Students admitted during session 2013-14 and thereafter.

APPENDIX – VII

CREDIT OF A SUBJECT IN SEMESTER & ITS PERCENTAGE CONTRIBUTION

Credit in any Semester is based on Lecture, Tutorial and Practical (L - T - P) hours assigned for the subject, as indicated in column 2, 3 and 4 of the Table below.

Lecture/ Tutorial: One hour per week in a semester will be equivalent to one credit.

Practice: Three hours per week in a semester will be equivalent to one credits

Credit of a course offered in a Semester = L + T + (P/3)

Credit of any subject will be an integer number. If Credit calculated as stated above has any fractional part that needs to be rounded off to an integer number. In case the course credit is a fractional number greater than or equal to 0.5, then it should be rounded up to next higher integer. If fractional part is less than 0.5 then should be ignored.

Fι	Full Marks for Theory & Practical Components Evaluation & its Contribution									
				Course	Theory Marks Distribution	Practical Marks Distribution (P)				

				Credits						Course	Theory Marks Distribution				Practical Marks Distribution (P)		
L	т	Ρ	Full Marks (FM)		Class Assessment : FM	Mid Sem Exam: FM	End Sem Exam: FM	Total Theory: FM	Class Assessment : FM	End Sem Exam: FM	Total Practical: FM						
0	0	1	0	0	0	0	0	0	0	0	0						
0	0	3	1	100	0	0	0	0	40	60	100						
0	0	4	1	100	0	0	0	0	40	60	100						
0	0	6	2	100	0	0	0	0	40	60	100						
0	0	60	20	100	0	0	0	0	40	60	100						
0	1	3	2	100	0	0	0	0	40	60	100						
1	0	3	2	100	0	0	0	0	40	60	100						
1	0	4	2	100	0	0	0	0	40	60	100						
1	0	6	3	100	0	0	0	0	40	60	100						
1	0	8	4	100	0	0	0	0	40	60	100						
1	1	0	2	100	20	20	60	100	0	0	0						
1	1	6	4	150	20	20	60	100	20	30	50						
2	0	0	2	100	20	20	60	100	0	0	0						
2	0	2	3	150	20	20	60	100	20	30	50						
2	0	4	3	150	20	20	60	100	20	30	50						
2	1	0	3	100	20	20	60	100	0	0	0						
2	1	3	4	150	20	20	60	100	20	30	50						
3	0	0	3	100	20	20	60	100	0	0	0						
3	0	3	4	150	20	20	60	100	20	30	50						
3	1	0	4	100	20	20	60	100	0	0	0						

Please refer to section 11.2 for details of weightage of different components for evaluation of course having Theory only, Practical only and Theory & practical