SASTRA UNIVERSITY

Shanmugha Arts, Science, Technology & Research Academy(SASTRA)

(A University established under section 3 of UGC Act, 1956)

Tirumalaisamudram, Thanjavur-613 401

Tamil Nadu, India

SCHOOL OF MECHANICAL ENGINEERING

B.Tech. Mechanical Engineering
B.Tech.Mechatronics
M.Tech. Automobile Engineering (5 Years Integrated Programme)*
M.Tech. Advanced Manufacturing (5 Years Integrated Programme)*

***Common syllabus with B.Tech. Mechanical Engineering Programme from 1 to 7 semesters**

(Scheme & Syllabi under Choice-Based Credit System)

(For students admitted in 2010 - 2011 and subsequently)

I YEAR

1st Semester

Course Code	Course Name	Periods / Week			Credits
		L	T	P	C
BMECEN 101R02 MAMCEN 101 R02 MAUCEN 101 R02 BMTCEN 101 R02	Strategies in Communication	3	-	-	3
BMECMA 102 MAMCMA 102 MAUCMA 102 BMTCMA 102	Mathematics – I	3	1	-	4
BMECCS 103 MAMCCS 103 MAUCCS 103 BMTCCS 103	Computer Programming - I "C"	3	1	-	4
BMECPY 104 MAMCPY 104 MAUCPY 104 BMTCPY 104	Engineering Physics	3	1	-	4
BMECCE 105 MAMCCE 105 MAUCCE 105 BMTCCE 105	Environmental Studies	3	-	2	4
BMECCE 106 MAMCCE 106 MAUCCE 106 **BMTCCE 106 R01**	Basic Civil Engineering	3	-	-	3
BMECCE 107 MAMCCE 107 MAUCCE 107 BMTCCE 107	Engineering Mechanics	3	1	-	4
BMECCS 108 MAMCCS 108 MAUCCS 108 BMTCCS 108	Computer Programming Lab - I "C"	-	-	3	2
BMECME 109 MAMCME 109 MAUCME 109 BMTCME 109	Workshop	-	-	3	2
BMECPY 110 MAMCPY 110 MAUCPY 110 BMTCPY 110	Engineering Physics Lab.	-	-	3	2
BMECEN 111 MAMCEN 111 MAUCEN 111 BMTCEN 111	Indian Culture & Ethics	1	-	-	1
	Total	22	4	11	33

2nd Semester					
Course Code	**Course Name**	**Periods / Week**			**Credits**
		L	T	P	C
BMECEN 201 R01 MAMCEN 201 R01 MAUCEN 201 R01 BMTCEN 201 R01	Technical Communication	3	-	-	3
BMECMA 202 MAMCMA 202 MAUCMA 202 BMTCMA 202	Mathematics – II	3	1	-	4
BMECCS 203 MAMCCS 203 MAUCCS 203 BMTCCS 203	Computer Programming - II "C++"	4	-	-	4
BMECCM 204 MAMCCM 204 MAUCCM 204 BMTCCM 204	Engineering Chemistry	3	1	-	4
BMECCE 205 MAMCCE 205 MAUCCE 205 BMTCCE 205	Engineering Drawing	2	-	4	4
BMECEE 206 MAMCEE 206 MAUCEE 206 BMTCEE 206	Basic Electrical & Electronics Engineering	3	-	-	3
BMECME 207 R01 MAMCME 207 R01 MAUCME 207 R01 BMTCME 207 R01	Basic Mechanical Engineering	3	-	-	3
BMECCS 208 MAMCCS 208 MAUCCS 208 BMTCCS 208	Computer Programming Lab - II "C++"	-	-	3	2
BMECCE 209 MAMCCE 209 MAUCCE 209 BMTCCE 209	Computer Aided Drawing Lab.	-	-	3	2
BMECCM 210 MAMCCM 210 MAUCCM 210 BMTCCM 210	Engineering Chemistry Lab.	-	-	3	2
BMECTP 211 R01 MAMCTP 211 R01 MAUCTP 211 R01 BMTCTP 211 R01	Personality Development	1	-	-	1
	Total	22	2	13	32
L –Lecture T-Tutorial P-Practical					

BMECEN 101R02/MAMCEN 101R02/MAUCEN 101 R02/BMTCEN 101 R02 : STRATEGIES IN COMMUNICATION

NUMBER OF PERIODS: 45 **CREDITS: 03**

OBJECTIVE

English I – Strategies in Communication undertakes to introduce B.Tech. students to the general aspects of communication, with special emphasis on Scientific discourse. In Unit I seven literary texts are introduced as communication models to be used for training students in LSRW skills through their active discussion, role play and presentation. Unit II is concerned with speech practice in various interpersonal interactions. Some basic rules to pronunciation are also introduced. Unit III deals with developing reading skills through comprehension, note-making and summarizing. Unit IV concerns itself with writing at micro level -- various vocabulary and grammatical features of writing. Unit V aims at introducing students to discourse features and paragraph writing. At the end of the course, the learners will be able to use all the four skills – listening, speaking, reading and writing with confidence on various topics of general interest.

METHODOLOGY

There will be less and less of teacher talking and more and more of student participation in terms of pair/small group/large group discussions and seminar presentations.

EVALUATION

There will be no questions on the theories of communication. Students will write 10 assignments and 3 tests at the formative stage. There will be a summative examination of 3 hours. The formative and summative tests will be so designed that they will help assess the learning outcome of the programme in terms of student performance.

UNIT I: TEXTS

1. Resolution and Independence – William Wordsworth
2. The Turning Point of My Life – A.J. Cronin
3. My Vision for India – A.P.J. Abdul Kalam
4. Profession for Women – Virginia Woolf
5. A Cup of Tea – Katherine Mansfield
6. Never, Never, Nest – Cedric Mount
7. Refund – Fritz Karinthy (Adapted by Percival Wilde)

(TO BE USED FOR TRAINING STUDENTS IN LSRW SKILLS THROUGH ROLE PLAY, PRESENTATION etc.)

UNIT II: SPEECH PRACTICE

A. Some basic rules to Spoken English

1. Introduction to Phonetic Symbols
2. Pronunciation of Initial, Medial and Final /r/, /ture/, and /tion-sion-cion/
3. Different ways in which ‘f’ sound gets represented
4. Silent letters
5. Word and sentence stress rules
6. Punctuation as a guide to pause
7. Intonation
8. Accent Neutralization

B. Interpersonal interaction

1. Greeting
2. Introductions
3. Making requests

4. Seeking permission, advice, suggestions
5. Asking for information
6. Congratulating
7. Apologizing
8. Asking for and giving personal information
9. Complaining without offending

(FOR INTERNAL ASSESSMENT ONLY)

UNIT III: READING

1. Comprehension
2. Note-making and summarizing

UNIT IV: WRITING: MICRO STRUCTURE

Special application of Vocabulary and Grammatical elements in Science and Technology

i. Concord – Subject - Verb; Noun - Pronoun
ii. Appropriate Verb Forms: aspects, questions and negatives
iii Use of Modal Auxiliaries
iv. Disambiguating words/phrases/sentences
v. Tightening the rambling sentences with regard to simplicity, clarity and precision
vi. Indianisms – Words, Sentence patterns
vii. Analytical Reasoning and Language Use

UNIT V: WRITING: MACRO STRUCTURE

1. Cohesion and Coherence
2. Discourse patterns/strategies – narration, description, process writing, enumeration, Classification, definition, comparison and contrast, cause and effect, and argument
3. Paragraph Writing: Topic Sentence and its expansion
4. Essay Writing

Text Book: Strategies in Communication – SASTRA Publications

Books for Reference:

1. Bhatnagar, R.P. and Rajul Bhargava. 2008 (1989). *English for Competitive Examinations.* Chennai: Macmillan India Limited.

2. Gadasalli, Raj. 2004. *Let's Speak American English*. Bangalore: Vipra Center.

3. Mohan, Krishna and Meera Banerji. 2009 (1990). *Developing Communication Skills.* Chennai: Macmillan Publishers India Ltd.

BMECMA 102/MAMCMA 102/MAUCMA 102/BMTCMA 102: MATHEMATICS – I

NUMBER OF PERIODS: 60 **CREDITS: 04**

UNIT: 1 **(15 Periods)**

TRIGONOMETRY: Expansions of sin nθ and cos nθ in powers of sinθ and cosθ – Expansions of $\sin^n\theta$ and $\cos^n\theta$ interms of sines and cosines of multiples of θ – Hyperbolic and inverse hyperbolic functions – logarithm of complex numbers – separation of complex functions into real and imaginary parts – simple problems.

UNIT: 2 **(15 Periods)**

THEORY OF EQUATIONS : Introduction - surds and irrational roots – simple problems – equations whose roots are in A.P,G.P and in H.P – Relations between the roots and coefficients – symmetric functions – Formation of equations – Decreasing and Increasing the roots – transformation of equation – Reciprocal equations.
ALGEBRA: Binominal, Exponential and logarithmic series (without proof) – problems on summation, coefficient and approximations.

UNIT: 3 (**15 Periods**)

DIFFERENTIAL CALCULUS: Curvature of curve – Radius of Curvature (Cartesian polar, parametric and implicit form) – Evolutes – Involutes – Envelopes (one parameter and two parameter) – Evolute as the envelope of normals
FUNCTIONS OF SEVERAL VARIABLES: Maxima and Minima of functions of two variables (proofs of theorems are not included) – Constrained Maxima and Minima – Lagrange's method of multipliers.

UNIT: 4 **(15 Periods)**

IMPROPER INTEGRALS: Concept of improper integrals with examples – Definition of Beta and Gamma integrals – Relations between them –properties of Beta and Gamma integrals with proofs – Evaluation of definite integrals in terms of Beta and Gamma integrals – simple applications (evaluation of double and triple integrals)
MULTIPLE INTEGRALS: Double integrals – Evaluation – change of order of integration – Triple integrals (problems involving Jacobians are not included) – Simple applications.

Text Book:

1. Engineering Mathematics I SASTRA University Publications,(Revised Edition 2007)

References:

1. Engineering Mathematics for first year, T.VEERARAJAN, 5th Edition, Tata McGraw Hill, 2006

2. Advanced Engineering Mathematics, Erwin Kreyszig. 8th Edition, John Wiley and Sons (ASIA) Pvt. limited 2003

BMECCS 103/MAMCCS 103/MAUCCS 103/BMTCCS 103
COMPUTER PROGRAMMING - I "C"

NUMBER OF PERIODS: 60 **CREDITS: 04**

UNIT: 1 **(15 Periods)**

INTRODUCTION: Structure of C – C fundamentals- Declarations – Data types – User defined data types – Operations – Type Conversion –I/O functions – Header file – Library functions
CONTROL STRUCTURE: Conditional constructs – control constructs – Multiple branching – Iteration and jump constructs.

UNIT: 2 **(15 Periods)**

ARRAY: Declaration – Initialization and manipulation of single & multidimensional array - String Handling, String Manipulations and character handling functions – String manipulation operations
FUNCTION: Declarations – Definition – Scope – Arguments –Call by reference & value – Recursion-storage classes – preprocessor directives

UNIT: 3 **(15 Periods)**

STRUCTURES AND UNIONS: Declarations – initializations and Manipulations – Nested Structure- Structure With arrays and functions.
POINTERS: Declarations – Accessing through pointers – pointer and character strings – pointer to pointer – Pointers in array, Structure and functions – Dynamic memory allocation

UNIT: 4 **(15 Periods)**

FILES: Sequential Access-Random Access-operating & closing file –file processing using file manipulation functions
GRAPHICS: Detect, Initiate and close graph primitive drawing functions (circle, line, ellipse, rectangle and images) **–** Sound and motion functions.

Text Book:
1. E. Balagurusamy, "Programming in ANSI C" 3 ed, TMI I 2006

References:

1. Yashwant Kanithker " Let us C" 7 ed, BPB 2007
2. Rajaraman, "Computer Programming in C", PHI 2005
3. Byron Gottfried " Programming with C" TMII, 2000

BMECPY 104/MAMCPY 104/MAUCPY 104/BMTCPY 104
ENGINEERING PHYSICS

NUMBER OF PERIODS: 60 **CREDITS: 04**

UNIT: 1 **(15 Periods)**

LASER AND FIBER OPTICS: Lasers – Einstein's theory – Population inversion – basic Principles of Laser action Conditions for Laser action – Nd – YAG. CO_2, Semiconductor laser – applications of lasers in Medicine, Engineering, communication and Computer peripherals – 3D profiling – Holography 3D Images – recording and reconstructing of Images (Quantitative treatment only)

FIBER OPTICS – Light propagation in optical fibers – Types of optical fibers – Step Index and Graded Index – Single mode and Multimode fibers – Applications in Medicine(Endoscopes) and communication Systems(Block diagram only). Sensors – Fibre Optical sensors– Displacement sensors and Pressure sensors.

UNIT: 2 **(15 Periods)**

MATERIALS SCIENCE: Crystal Systems – Bravais Lattice - Miller indices – Symmetry elements – Crystal structures of Engineering materials (SC, BCC, FCC, HCP, Diamond Structure) – Electrical conductivity and Thermal Conductivity – Derivation of Electrical Conductivity of metal (Drude Lorentz theory)– Derivation of Thermal Conductivity of metals – Wiedemann Franz Law-

Classification of Metals, Insulators and Semiconductors - Bonding of Semiconductors – Types of Semiconductors – Expression for Conductivity of Semiconductor – Carrier Concentration in Intrinsic Semiconductor – Variation of Fermi level with temperature for Intrinsic Semiconductor – Hall Effect – experimental determination of Carrier concentration and mobility.

UNIT: 3 **(15 Periods)**

DIELECTRICS AND SUPERCONDUCTORS: Dielectrics – Dielectric polarization – Expression for electronic polarisability – Dielectric loss – Local field in dielectric – Claussius – Mosotti equation – Dielectric breakdown – Different types of dielectric materials – Ferro electricity.

SUPER CONDUCTORS: Temperature dependence of resistance – Meissner's effect – BCS theory – Type I and Type II super conductors – High temperature superconductors.

UNIT: 4 **(15 Periods)**

BIO- PHYSICS: Ultrasonic – Production (piezo electric method) – Construction of Ultrasonic transducer – Ultrasonic propagation through tissues - Measurement of acoustic impedance(pulse echo interferometer) – Physiological effect of ultrasound – Ultrasonic imaging systems – Digital real time scanner and Computer controlled imaging – Visualization of X-rays – radiography and Fluoroscopy – X ray films – Image intensifier – Nuclear medicine – radio isotopes – Nuclear Imaging Device(Gamma ray camera)

Text Book:

1. Dr. M.Arumugam, "Applied Physics", Anuradha Agencies,2006

References:

1. R.K gaur & S.L Gupta 0 "Engineering Physics", Dhanpat Rai & Sons,16 th edition ,2002
2. Dr.M.Arumugam , " Engineering Physics", Anuradha Agencies,2003
3. C.Kittel , " Solid State Physics",wiley Eastern Ltd,2007

BMECCE 105/MAMCCE 105/MAUCCE 105/BMTCCE 105
ENVIRONMENTAL STUDIES

NUMBER OF PERIODS: 60 **CREDITS: 04**

UNIT: 1 **(12 Periods)**

INTRODUCTION: The Multidisciplinary nature of environmental studies: Definition, scope and importance - Need for public awareness
NATURAL RESOURCES: Renewable and non-renewable resources: Use And over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people - Water resources: utilization of surface and ground water, floods, drought, conflicts over water, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects if extracting and using mineral resources, case studies- Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer – pesticide problems, water logging, salinity, case studies - Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, case studies - Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification - Role of an individual in conservation of natural resources - Equitable use of resources for sustainable lifestyles

UNIT: 2 **(11 Periods)**

ECO – SYSTEMS: Concept of an ecosystem - Structure and function of an ecosystem - Producers, consumers and decomposers - Energy flow in the ecosystem - Ecological succession - Food chains, food webs and ecological pyramids - Introduction, types, characteristic features, structure and function of the following ecosystem - Forest ecosystems - Grassland ecosystems- Desert ecosystems - Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)
BIODIVERSITY AND ITS CONSERVATION: Introduction: Definition: genetic, species and ecosystem diversity - Biographical classification of India - Value of biodiversity: Consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, national and local levels - India as a mega-diversity nation - Hotspots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts - Endangered and endemic species of India - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

UNIT: 3 **(11 Periods)**

ENVIRONMENTAL POLLUTION: Definition - Causes, effects and control measures of - Air pollution - Water pollution - Marine pollution - Noise pollution - Nuclear hazards - Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution - Pollution case studies - Disaster Management: Floods, earthquakes, cyclones and landslides

UNIT: 4 **(11 Periods)**

SOCIAL ISSUES AND THE ENVIRONMENT: From unsustainable to sustainable development - Urban problems related to energy - Water conservation, rainwater harvesting, and watershed management
ENVIRONMENTAL ETHICS: Issues and possible solutions - Climate change, global warming, acid rain, and ozone layer depletion, nuclear accidents and holocaust. Case studies - Wasteland reclamation - Consumerism and waste products - Environment Protection Act - Air (Prevention and Control of Pollution) Act - Wildlife Protection Act - Forest Conservation

Act - Issues involved in enforcement of environmental legislation - Public awareness - Environmental Impact Assessment

HUMAN POPULATION AND THE ENVIRONMENT: Population growth, variation among nations - Population explosion – Family Welfare Programme - Environment and human health - Human Rights - HIV / AIDS - Women and Child Welfare - Role of Information Technology in Environment and human health - Case Studies.

FIELD WORK: A guided field visit to one of the following natural ecosystem. Visit to a local area to document environmental assets –river / forest / grassland / hill / mountain - Visit to a local polluted site – Urban / Rural / Industrial / Agricultural - Study of common plants, insects, birds - Study of simple ecosystems – pond, river, hill slopes, etc

Text Books:

1. "A Hand Book of Environmental Studies UG Course Material" – Compiled by Faculty of School of Civil Engineering, SASTRA.

2. Bharucha Erach (Ed), (2004), "Text Book for Environmental Studies", UGC, New Delhi.

Reference:

1. Anjaneyulu Y, (2004), "Introduction to Environmental Science", BS Publications, Hyderabad.
2. Bharucha Erach, "Textbook of Environmental Studies for Undergraduate Courses", University Press.
3. Daniel B, Botkin et.al, (2000), "Environmental Science", John Wiley & Sons
4. Meenakshi. P, "Elements of Environmental Science and Engineering", Prentice – Hall ofIndia, New Delhi
5. William P,Cunnigham et.al, (2002), "Principles of Environmental Science", Tata McGraw Hill Edition

BMECCE 106/MAMCCE 106/MAUCCE 106/BMTCCE 106 R01
BASIC CIVIL ENGINEERING

NUMBER OF PERIODS: 45 **CREDITS: 03**

UNIT: 1 **(12Periods)**

Role of Civil Engineer in a project – Branches and applications of Civil Engineering. Construction Materials: Properties and testing of building materials like Brick, Cement, Concrete, RCC, Steel, Timber, Plastics - Classification of buildings according to National Building Code

UNIT: 2 **(11 Periods)**

Construction of building components – foundations, brick, stone masonry, floors, beams, lintels, slabs, roofs, doors and windows

Mechanical properties of materials: Tension, compression, Shear, stress, strain, various modulii of elasticity E, N and K their relationship, Poisson's ratio (no derivation), factor of safety, compound, composite bars, - simple problems on applications

UNIT: 3 **(11 Periods)**

Water supply engineering – protected water supply, water quality, treatment and distribution – sanitary engineering, terms, definitions, conveyance and treatment and disposal of sewage Dams: selection of site, classification, types, components, uses Bridges: classification, components

UNIT: 4 **(11 Periods)**

Surveying: Classification, Principles, Chain, Compass Surveys, Leveling-Simple problems – Introduction to total station — Contours – Calculation of areas by Trapezoidal and Simpson's rule. Transportation Engineering: modes of transportation, classification of roads, components, geometric parameters – construction of various types of roads. Traffic signs, signals – railways – permanent way – comparison of roadway and railway – gauges, components, points and crossings

Text Book:

1. Palanichamy. M.S, Basic Civil Engg., Tata Mcgraw Hill(P) Co Ltd., NewDelhi

References:

1. Arunachalam. N, Basic Civil Engg., Pradeepa Publications, Coimbatore.
2. Natarajan. K.V, Basic Civil Engg., Dhanalakshmi Publications, Chennai.
3. Ramamirtham. S, Basic Civil Engg., Dhanpat Rai Publications, NewDelhi.
4. Rangwala. S.C, Engineering Materials, Charotar Modhi Publishing house, Anand, Gujrat.

BMECCE 107/MAMCCE 107/MAUCCE 107/BMTCCE 107
ENGINEERING MECHANICS

NUMBER OF PERIODS: 60 **CREDITS: 04**

UNIT: 1 **(15 Periods)**

EQUILIBRIUM OF PARTICLES: Frames of reference- Force Systems – Resolution and addition of forces, resultant of several concurrent forces, Forces in 3D, Equations of equilibrium of particle in 2D and 3D - Lame's theorem.

UNIT: **2** **(15 Periods)**

EQUILIBRIUM OF RIGID BODIES: Moment of a force about a point – moments and couples - Varignon's theorem - equivalent force systems-resultant of non-concurrent force systems – parallel forces. Equations of equilibrium of rigid bodies in 2D and 3D-Applications: Beams – types of supports, loads and reactions. Concept of internal forces-Analysis of pin jointed trusses – Method of sections and joints.

UNIT: 3 **(15 Periods)**

FRICTION: Laws of friction – simple contact friction - cone of friction – belt friction – wedge friction – screw jack.
PROPERTIES OF AREAS: Centroid of line, area and volume – Composite areas – hollow sections – Center of gravity of regular solids – cone – hemisphere. Second moment of areas – Parallel axis theorem – perpendicular axis theorem- Method of integration for M.I of areas – triangle, circle, semi circle, quadrant of a circle- Composite sections – Tee section, I section, Z section

UNIT: 4 **(15 Periods)**

DYNAMICS OF PARTICLES: Displacement, velocity and acceleration and their relationship – rectilinear and curvilinear motion - rectangular components, Tangent and normal acceleration. Motion in a circular path- Newton's law – Applications- Work energy principle- impulse and momentum principle- Applications

Text Books:

1. Beer.F.P and Johnston.E.R, Vector Mechanics for Engineers – Statics and Dynamics,McGraw Hill International Book Company.
2. Rajasekaran.S and Sankarasubramanian.G, Fundamental of Engineering Mechanics, Vikas Publishing House Pvt. Ltd.

References:

1. Ferdinand.L.Singer, Engineering Mechanics (Statics and Dynamics), Harper Row Publishers
2. Meriam.J.L and Kraige.L.G, Engineering Mechanics (Statics and Dynamics), John Wiley and Sons.
3. Shames.I.H, Engineering Mechanics (Statics and Dynamics), Prentice – Hall of India-New Delhi
4. Timoshenko.S.P and Young.D.H, Engineering Mechanics, McGraw Hill Book Co. Ltd.

BMECCS 108/MAMCCS 108/MAUCCS 108/BMTCCS 108
COMPUTER PROGRAMMING LAB - I "C"

CREDITS: 02

1. Programs on arithmetic operators (like simple interest, compound interest and Celsius to Fahrenheit)
2. Programs on conditional and looping statements (like solving Quadratic equation. Sine and cosine series, Summation of digits)
3. Programs on Numerical Methods problems (like Runge-Kutta Method, Gauss-Seidal method)
4. Programs on arrays (like Matrix operations, finding minimum or maximum in a set of numbers)
5. Programs on string manipulations (palindrome, pattern searching)
6. Programs on Functions and recursion (factorial, Fibonacci, tower of Hanoi)
7. Programs on structure and unions(student, employee details)
8. Programs on pointers (sorting or searching)
9. Programs on files(payroll processing)
10. Menu driven Programs to demonstrate graphic functions (circle, line ,ellipse arc)
11. Programs on Dynamic memory allocation
12. Programs on Command Line Arguments

BMECME 109/MAMCME 109/MAUCME109 /BMTCME 109 : WORKSHOP

CREDITS: 02

Safety Precautions to be followed in workshop

CARPENTRY: Study of Carpentry tools, Preparation of Cross Halving and Dove Tail Joint.

SHEET METAL: Study of sheet metal tools & equipments, Preparation of Cylinder & Tray.

FOUNDRY: Study of foundry tools, Preparation of green sand mould for cube & bend pipe patterns.

FITTING: Study of fitting tools, Preparation of square and angle fitting.

WELDING: Study of welding tools, equipments and power sources - preparation of Lap joint and Butt joint.

SMITHY: Study of smithy tools and equipments - Conversion of round rod to square rod

BMECPY 110/MAMCPY 110/MAUCPY 110/BMTCPY 110
ENGINEERING PHYSICS LAB.

CREDITS: 02

1. Determination of wavelength of Mercury Spectrum - Spectrometer Grating.
2. Determination of Radius of Curvature of Lens – Newton's Ring Method.
3. Determination of Moment of Inertia – Torsional Pendulum.
4. Determination of Thermal Conductivity of Bad Conductor - Lee's Disc method
5. Study of NPN Transistor Characteristics – Common Emitter Configuration.
6. Determination of Numerical Aperture and Measurement of Attenuation- Optical Fibers.
7. Calibration of Ammeter – Potentiometer.
8. Determination of wavelength of Laser – Grating.
9. Photography and Non – Destructive Testing.
10. Thermistor- Variation of Resistance with Temperature.
11. Logic Gates- OR, AND, NOT, NOR, NAND using TTL ICs.
12. Ultrasonic Interferometer- Velocity of Ultrasonic waves in Liquids and Compressibility of the liquid.

BMECEN 111/MAMCEN 111/MAUCEN 111/BMTCEN 111: INDIAN CULTURE & ETHICS

NUMBER OF PERIODS: 15 **CREDIT: 01**

OUR CULTURAL HERITAGE

Dharma: Ethical Values- Truth- Non-violence.

Service – Sacrifice - Love – Universal Brotherhood

Honesty- Work Ethics- Duty – Tolerance

Swadharma- Self – knowledge – Self improvement.

The individual and Society

The Beautiful and the Good

Religion: Need – Universality – inter- religious understanding

Scientific Humanism

References:

1. Radhakrishnan. S - Indian Religion (Orient Paper Backs).
2. Jawaharlal Nehru – The Discovery of India : Chapters 3&4 – (OUP)
3. David Frawley- Hinduism; The Eternal Tradition; Chapter 1.6 (Voice of India, New Delhi)

BMECEN 201 R01/MAMCEN 201 R01/MAUCEN 201 R01/BMTCEN 201 R01
TECHNICAL COMMUNICATION

NUMBER OF PERIODS: 45 **CREDITS: 03**

OBJECTIVE :

English II: Technical Communication focuses on developing proficiency of B.Tech. Students in communication skills specific to their studies and likely demand in their workplace thereafter. Unit I introduces communication models where certain significant features like Courtesy, Body Language, Cultural differences can be gained indirectly by their participation in discussion, role play and presentation. Unit II introduces them to the full import of technical communication, Unit III to the special features of listening. Unit IV exposes the learner to the intricacies of speaking and Unit V to the special features of technical writing.

At the end of the course learners will be able to use English for all purposes of technical communication – make effective interpersonal interactions, make effective presentations and write various types of reports in appropriate format.

METHODOLOGY

Teachers will be guides on the sides, than sages on the stage. Students will learn the intricacies of technical communication through their active participation in pair/small group/large group discussions and seminar presentations.

EVALUATION

There will be no questions on theory. Students will do 10 assignments and three tests at the formative stage and one comprehensive summative examination of 3 hours at the end of the course. The formative and summative tests are designed to assess the outcome of the programme in terms of student performance.

Unit I: TEXTS

1. On Saying Please – A.G. Gardiner
2. Mr. Know All – Somerset Maugham
3. Notes on English Character – E.M. Forster
4. Science – Destroyer or Creator – J. Bronowski
5. The Technological Engine – Alvin Toffler
6. Dear Departed – Stanley Houghton
7. Hour of Truth –Percival Wilde

Unit II: Nature of Technical Communication

1. Definition, importance and process
2. 6c s of Communication
3. Maslow's hierarchy of needs, The 'you' attitude, Use of positive language, Confidence versus Sarcasm
4. Importance of Technical Communication
5. General and Technical Communication
6. Process of Communication
7. Levels of Communication – Interpersonal/Organizational/Mass
8. Flow of Communication – Downward/Upward/Horizontal

Unit III: Listening Comprehension (For internal assessment only)

1. Listening Process
2. Barriers to Listening

3. Types of Listening
4. Characteristics of a good listener
5. Listening and Note-taking
6. Training in Listening

Unit IV: Professional Speaking (For internal assessment only)

1. Audience Analysis
2. Organizing a speech
3. Delivering a speech: Presentation Strategies
4. Interview Techniques
5. Group Discussion

Unit V: Professional Writing

1. Trans-coding -- from verbal to visual & from visual to verbal
2. Editing, Proof reading, Referencing
3. Proposals
4. User manual and Product description
5. Reports – feasibility, market survey, project
6. Conference paper/journal article writing in IEEE Format
7. Memos and E-mails
8. Advertisement Writing

Text Book

1. Technical Communication. SASTRA Publication.

Books for Reference:

1.Gerson, Sharon J and Steven M. Gerson. 2007. *Technical Writing: Process and Product*. Delhi: Pearson Prentice Hall.

2.Raman, Meenakshi and Sangeetha Sharma. 2004. *Technical Communication: Principles and Practice.* New Delhi: OUP.

3.Rizvi, Ashraf. 2006. *Effective Technical Communication*. New Delhi: Tata Mc Graw Hill Publication Company Ltd.

BMECMA 202/MAMCMA 202/MAUCMA 202/BMTCMA 202: MATHEMATICS – II

NUMBER OF PERIODS: 60 **CREDITS: 04**

UNIT: 1 **(15 Periods)**

ORDINARY DIFFERENTIAL EQUATIONS: Bernoulli's Differential equation – Solvable for p, x, y – Clairaut's form – Exact form only – Application in Electrical circuits – current inductive circuits – Capacitance circuits – Orthogonal trajectories – solving second and higher order ordinary differential equations with constant coefficients – particular integrals of various functions – Euler's differential equations with variable coefficients - Simultaneous differential equations with constant coefficients – method of variation of parameters.

UNIT: 2 **(15 Periods)**

MATRIX ALGEBRA: Introduction – Inverse of a matrix by elementary transformation – Linear independence and dependence of vectors- Eigen values and Eigen vectors – properties of Eigen values and Eigen vectors with proofs – Cayley Hamilton theorem(without proof) Finding higher powers and Inverse of the matrix by using Cayley Hamilton theorem – Similarity transformation – Diagonalisation of a matrix by similarity transformation – Orthogonal matrix - Diagonalisation of a matrix by orthogonal reduction – Quadratic Forms – Nature of Quadratic forms – reductions of Quadratic form to Canonical form.

UNIT: 3 **(15 Periods)**

VECTOR CALCULUS: Vector differentiation Gradient, Divergence and Curl – Geometrical and Physical Interpretation(without proof) – Irrotational and Solenoidal vector fields – vector fields – vector operator identities without proof – Vector integration definition – Simple problems on line, surface and volume integrals – Green's theorem, Stoke's theorem and Gauss Divergence theorem (without proof) – verifications and applications

UNIT: 4 **(15 Periods)**

SEQUENCE AND SERIES: Introduction to Sequence and Series – Convergence and Divergence of Series (Real) – Series of positive terms – Comparison Test – $\Sigma\, 1/n^p$ test – Cauchy's Condensation Test – Cauchy's Root Test – Ratio Test – RaBCH's Test – Alternating Series – Leibnitz's Test (only statement of Tests – no proof) Examples under the above tests - Problems

Text Book:

1. Engineering Mathematics II, SASTRA University Publications, (Revised Edition 2007)

References:

1. Engineering Mathematics Volume II, M.K Venkataraman, National publishing company, India 2001.
2. Engineering Mathematics for first year, T.Veerarajan, 5th Edition, Tata McGraw Hill, 2006
3. Engineering Mathematics Volume III, P.Kandasamy and others, S,Chand 2006
4. Advanced Engineering Mathematics, Erwin Kreyszig, 8th Edition, John Wiley and Sons (ASIA) pvt limited 2003.
5. Advanced Calculus , Volume I, S. Arumugam, A.Thangapandi Issac, New Gamma Publishing House.
6. Algebra Narayanan ,T.K.Manicavachagom Pillai, Ganapathy, S.V. Publishers.

BMECCS 203/MAMCCS 203/MAUCCS 203/BMTCCS 203
: COMPUTER PROGRAMMING - II " C++"

NUMBER OF PERIODS: 60 **CREDITS: 04**

UNIT: 1 **(15 Periods)**

BASIC CONCEPTS OF OOPS: Characteristics of OOPS – Benefits of OOPS – Introduction to object oriented design and development – Design steps – Object oriented languages – comparison of C and C++.
C++ program structure, data types, operators. Expressions, I/O functions, Type conversion control constructs, header files, arrays & string handling

UNIT: 2 **(15 Periods)**

FUNCTIONS: Inline function – Function overloading-virtual and friend functions Classes – Objects – Constructors – Destructors – Operator overloading – type conversion – Dynamic memory allocation – Pointers – new-delete-this pointer Inheritance: Single – Multiple – Multilevel – Hierarchical and Hybrid inheritance.

UNIT: 3 **(15 Periods)**

VIRTUAL FUNCTIONS: Friend functions- generic programming with templates – Managing console I/O operations. Files & Streams, File pointers and their manipulations, Sequential and Random Access – Command line arguments

UNIT: 4 **(15 Periods)**

CLASSES: Exceptional Handling – List of exceptions – Catching and handling exceptions string class – Data class – Queue class – list class – Use defined classes
GRAPHICS: Text mode and graphic mode functions – Primitive drawing functions in C++ - Sound and motion – colors – text in graphic mode

Text Books:

E.Balagurusamy: "Object Oriented Programming with C++". TMI 3 ed ,2006

References:

1. Robert lafore : "Object Oriented Programming in Turbo C++", Galgotia Publications 2006
2. Bjarne Stroustrup, "The Programming language", Pearson Education, 3 ed 2000

BMECCM 204/MAMCCM 204/MAUCCM 204 /BMTCCM 204

ENGINEERING CHEMISTRY

NUMBER OF PERIODS: 60 **CREDITS: 04**

UNIT: 1 **(15 Periods)**

WATER TREATMENT: Complexometric determination of hardness of water – EDTA method, Problems on hardness calculation, Specification for boiler feed water, Boiler problems – Scales and sludges, Boiler corrosion, Caustic embrittlement, Priming & foaming. Various internal treatment procedures of boiler water External treatment methods – Lime – soda process – Different variations, Zeolite process, Ion exchange process. Specifications for drinking water, treatment of water for domestic use Desalination of brackish water – Electro dialysis, Reverse osmosis

UNIT: 2 **(15 Periods)**

HIGH POLYMERS & NANOTECHNOLOGY: Monomers and their functionality, Nomenclature of polymers, Classification of polymers, Types of polymerization - Chain (addition) and step-growth (condensation) polymerizations, Mechanism of chain polymerization – Free radical and ionic mechanisms, Coordination polymerization, Plastics, compounding of plastics Fabrication techniques – Compression, injection and transfer moldings, Preparation and uses of some thermoplastic (Rosin.Shellac,Cellulose derivates, Vinyl resins Polyamides – Nylons and Kevlar) and thermosetting (Phenoplasts, Amino resins, Polyester resins, Alkyd resins, Epoxy resins, Polyurethanes, Silicones) resins -Structure – property relationship in polymers – Physical state- Chemical resistance and strength of polymers Foamed, reinforced and conducting polymers, Nanomaterials and their size related special properties, Productions of Nanomaterials – Plasma arcing, Chemical vapour deposition and electro deposition. Applications of nanomaterial, Catalysts, Coatings, Cosmetics, Machine tools, Phosphors, Sensors, Medical implants, Respirocyte smart fabrics.

UNIT: 3 **(15 Periods)**

ELECTROCHEMISTRY, BATTERIES & FUEL CELLS: Distinction between electrolytic and galvanic cells, Single electrode potentials, Reference electrodes (SHE & SCE), Standard cell – Weston cadmium cell. Electrochemical series and its applications Reversible and irreversible cells, Concentration cells.

Storage batteries, Classification Lead-acid storage battery, Zinc-carbon dry cell, alkaline battery, Mercury battery, Silver oxide battery, Nickel-cadmium battery, Lithium batteries – Li-TiS_2 and Li-Sulphur. Battery hazards- Types of fuel cells – Hydrogen – Oxygen fuel cell – Advantages and Limitations.

UNIT: 4 **(15 Periods)**

CORROSION & PROTECTIVE COATINGS: Chemical and electrochemical corrosions, Factors influencing corrosion, Mechanism of rusting of iron in acid neutral and alkaline environments, Differential metal corrosion ,Differential aeration,Atmospheric and soil corrosion,Control of corrosion,Anodic and cathodic protections ,corrosion inhibitors. Importance of selection of materials and design of structural patterns in corrosion control

PROTECTIVE COATINGS: Preliminary treatment of surfaces. Classifications of surface-coatings- Inorganic coatings – Hot dipping, metal spraying, Cementation, Surface conversion, Electroplating, Anodizing Vitreous coating Organic surface coating – Oil paints – Ingredients of Oil paints and their functions, Emulsion paints. Varnishes and lacquers- Special paints – Heat resistant, fire retardant, temperature indicating, water repellant- Antifouling and luminous paints

Text Book:

1. R.Gopalan, D.venkappayya and Sulochana Nagarajan, "A Text book of Engineering Chemistry", Vikas Publishing House New Delhi, 3 rd edition (2006)

References:

1. J.C. Kuriacose and J.Rajaraman, "Chemistry in Engineering & Technology", Vol I & II. Tata McGraw Hill Publishing Company, New Delhi (1984)
2. Mark Ratner & Daniel Ratner, "Nanotechnology – A Gentle Introduction to the Next Big Idea", Pearson Education (Low price Edition) 2005.

BMECCE 205/MAMCCE 205/MAUCCE 205/BMTCCE 205
ENGINEERING DRAWING

NUMBER OF PERIODS: 60 **CREDITS: 04**

UNIT: 1 **(15 Periods)**

BASICS OF ENGINEERING DRAWING AND CURVES USED IN ENGINEERING PRACTICES: Importance of drawing in engineering applications – Use of drafting instruments – BIS specifications – lettering and dimensioning – Geometric construction – Conic sections: ellipse, parabola and hyperbola. Cycloids: epicycloids and hypocycloid. Involutes: triangle, square and circle.

UNIT: 2 **(15 Periods)**

PROJECTION OF POINTS, LINES AND SOLIDS: General principles of orthographic projections – First angle projection – projection of points located in all quadrants – projection of straight lines located in the first quadrant: determination of true lengths and true inclinations – Projections of Solids: prisms, pyramids, cylinders and cones (Truncated solids not included) – change of position method and change of reference line method.

UNIT: 3 **(15 Periods)**

SECTION OF SOLIDS AND DEVELOPMENT OF LATERAL SURFACES: Section of solids: true shape of sections – development of lateral surfaces of solids: prisms, pyramids, cylinders and cones

UNIT: 4 **(15 Periods)**

ISOMETRIC PROJECTION AND BUILDING DRAWING: Principles of Isometric projection – Isometric projections of simple and truncated solids: prisms, cylinders and cones. Introduction to building drawing: simple problem on residential building (up to three rooms).

Text Books:

1. K.Venugopal, "Engineering Drawing", New Age International (p) Limited.2002
2. K.V.Natarajan, "A text book of Engineering Drawing Graphics", Dhanalakshmi publishers, Chennai, 2006.

References:

1. K.R.Gopalakrishna, "Engineering Drawing",(Vol I & II) Subas publications,1998
2. N.D.Bhatt, "Engineering Drawing", Charotar publishing house, 46th edition,2003

BMECEE 206/MAMCEE 206/MAUCEE 206/BMTCEE 206
BASIC ELECTRICAL & ELECTRONICS ENGINEERING

NUMBER OF PERIODS: 45 **CREDITS: 03**

UNIT: 1 **(11 Periods)**

DC & MAGNETIC CIRCUITS: Definition of current, potential, resistance. Electrical power, electrical energy – Symbols and units – SI units – Ohm's law – Kirchhoff's laws – Solution of simple circuits using Ohm's law and Kirchhoff's laws – Mesh and Nodal analysis – simple problems

Definition of m.m.f, flux and reluctance – analysis of simple series (compound) magnetic circuits – problems- Leakage flux and Leakage coefficient 0 comparison between electric and magnetic circuits

Faraday's law of electromagnetic induction – Lenz's law – statically and dynamically induced emf – self and mutually induced emfs- self and mutual inductances – energy stored in the magnetic field of an inductor – force on a carrying element in a magnetic field – Fleming' right and left hand rules – Simple problem

UNIT: 2 **(12 Periods)**

A.C. CIRCUTS: Generation of alternating emf – Average & RMS values of periodic wave from – form& peak factors- concept of phasor representation – complex operator 'J' – A.C circuits involving R,L&C, active power and reactive power, apparent power & power factor – Solution of series & parallel circuits. Series resonance – simple problems

Concept of three-phase emf generation – star & delta connections – relationship between line & phase values of voltages and current in a balanced system – power in three phase system

UNIT: 3 **(11 Periods)**

SEMICONDUCTOR DEVICES: Basic concept and VI Characteristics of PN-junction diodes, Zener diodes, BJT and its configurations – input/output Characteristics, Junction field effect transistor – Drain and Transfer Characteristics – MOSFET – Depletion type and enhancement type, Thyrister – SCR – VI Characteristics, photoelectric devices – photo diodes – photo transistor and LDR.

UNIT: 4 **(11 Periods)**

INTEGRATED CIRCUITS: Introduction to principles of ICs – IC fabrications of diode and BJT – linear ICs, Introduction to Operational Amplifiers – Ideal Op-Amp- DC & AC Characteristics, nonlinear ICs – introduction to logic gates- OR, AND, NOT, NOR & NAND gates.

Text Books:

1. Fundamentals of Electrical & Electronics Engineering, B.L.Theraja, S.Chand& Co.,New Delhi.
2. Linear Integrated Circuits, Roy Chowdry & Shail Jain, new Age International (P) Ltd,2000

Reference:

1. Basic Electrical & Electronics and computer engineering, K.A.Muraleedharan & R.Muthusubramanian, Tata McGraw-Hill. 1997.

BMECME 207 R01/MAMCME 207 R01/MAUCME 207 R01/BMTCME 207 R01: BASIC MECHANICAL ENGINEERING

NUMBER OF PERIODS: 45 **CREDITS: 03**

UNIT: 1 **(12Periods)**

ENERGY RESOURCES :Conventional Sources of Energy-Basics and Applications of Fossil Fuels -Hydel Nuclear-Non-conventional Sources of Energy – Basics and Applications of Solar – Wind – Tidal-Geothermal-Bio-Mass –Ocean Thermal- Fuel cell-Wave energy.

STEAM GENERATORS AND TURBINES: Boilers- Classification and types of Boilers-Cochran - Babcock and Wilcox –Lamont Benson Boiler Mounting and Accessories-Turbines-Classification –Construction and Working Principle of simple Impulse and Reaction turbines

POWER PLANTS: Layout and description of Steam – Gas Turbine-Diesel-Nuclear-Hydel Power Plants –Basics of Cogeneration –Topping and Bottoming cycles

UNIT: 2 **(11 Periods)**

I.C.ENGINES: Classification-Engine Components –Working Principles of two stroke, Four Stroke, Petrol & Diesel Engines-Carburetion - Simple carburetor –Ignition systems – Battery and Magneto Systems-Fuel Injection Pump(FIP) and Injector of Diesel Engine – Air cooling and pressurised Water cooling –pressurised Lubricating system.

REFRIGERATION AND AIR CONDITIONING: Refrigeration – Simple Vapour Compression Refrigeration system. Refrigerants - Air conditioning. Layout of simple Window and central air Conditioning Systems

UNIT: 3 **(11 Periods)**

METAL FORMING: Casting Types of Patterns – Cores –Materials, Properties and ingredients of Molding Sand –Green and Dry Sand Mould Preparation using two piece Split Pattern-Melting of Metals and Alloys Coke Fired Stationary Crucible Furnaces-Cupola – Casting Defects-Principles of - Forging, Rolling, Wire Drawing, and Extrusion

UNIT: 4 **(11 Periods)**

METAL JOINING: Manual Metallic Arc Welding (MMAW) –Equipments –Oxy-acetylene Gas welding –Equipments-Gas cutting –Flames –Brazing and soldering-Welding Defects

METAL MACHINING: Main components and Functions of centre Lathe – Radial Drilling Machine and Shaping Machine -.Operations-Introduction to CNC Machines

Text Book:

1. S.R.J. Shanthakumar, “Basic Mechanical Engineering”, HI-TECH Publications

References:

1. S.Rao and Dr.B.B.Parulekar, “Energy Technology” , Khanna Publishers
2. G.R.Nagpal, “Power Plant Engineering”, Khanna Publilshers
3. R,K.Rajput, “Thermal Engineering” , Lakshmi publishers
4. S.K.Hajra Chowdri, “Elements of Workshop Technology” Vol. I &II Asia Publishing House
5. M.P.Groover, “Introduction to CAD/CAM./CIM”, PHI Ltd.

BMECCS 208/MAMCCS 208/MAUCCS 208 /BMTCCS208
COMPUTER PROGRAMMING LAB – II "C++"

CREDITS: 02

1.Write program in C++ to accept a single character from the keyboard Display the Character or keystroke and its decimal, hexadecimal and octal values in the format: Character decimal hexadecimal octal.

2. Write program to generate the following pyramid

```
        0
    1   0   1
2   1   0   1   2
```

3. Write program to perform arithmetic operations addition, subtraction. Multiplication and division of two numbers using pointer to a function.
4. Read a set of lines from stdin, Store them in an array again read a strings from stdin check whether the given strings in array and print the result to stout.
5. Write a program to read a set of names, register numbers, DOB and date of admission of the students where the dates consists of 3 members such as day. Month and year as a separate structure. Sort them in ascending order using a structure data type.
6. Develop a program to create a data box with the following items using a structured data type. Name of the patient, sex, Age, ward number, nature of illness, date of admission. The program should build a table. List the table. Insert entries, delete entries edit an entry and search for a record.
7. Write a program using classes and objects to read a set of lines and find out the number of characters, words and lines in a given text.
8. Write a program to perform the salary details of the employees of a company using Constructor and destructor the employee detail should include number, name, age, sex, basic salary, designation and department. Calculate HRA, CCA, DA, TA, PF, and LIC according to basic salary. Display gross pay and net pay.
9. Write a program to perform simple operations of two complex numbers using operator overloading.
10. Write a program for finding the smallest and largest in a list of N numbers. Accept the value of N at runtime and allocate the necessary amount of storage for strong numbers.
11. Write a program to perform the following using function overloading:
    a. To read a set of integers.
    b. To read a set of floating point numbers
    c. To read a set of double numbers.

    And find out the average of the non negative numbers.
12. Design three classes: Student, Exam and Result. The student class has data members such as Student number; names etc. create a class Exam by inheriting the student. The exam class adds data members representing the marks scored in 6 subjects. Derive the result from the exam class and it own data members such as total marks. Write an interactive program to model this relationship.

BMECCE 209/MAMCCE 209/MAUCCE 209/BMTCCE 209
: COMPUTER AIDED DRAWING LAB.

CREDITS: 02

1. Introduction
2. Basic commands
3. Modifying commands
4. Editing commands
5. Changing Object Properties
6. Text and Dimensioning
7. Drawing Information
8. Orthographic and Isometric Drawing

BMECCM 210/MAMCCM 210/MAUCCM 210 /BMTCCM 210
ENGINEERING CHEMISTRY LAB.

CREDITS: 02

1. Estimation of hardness of water by EDTA method
2. Estimation of COD of water
3. Estimation of sodium and calcium ions in water by flame photometry.
4. Estimation of iron (II) using diphenyl amine-Dichrometry – internal indicator method.
5. Estimation of chloride ion using potassium chromate indicator (Mohr's method).
6. Determination of p^H of a solution and p^H- metric titration.
7. Preparation of polystyrene by free radical polymerization.
8. Determination of viscosity and molecular weight of polyvinyl alcohol using Ostwald's Viscometer.
9. Determination of single electrode potential of the given electrode and Determination of emf of the given cell.
10. Determination of iron (II) using potentiometer (Radox titration)
11. Determination of equivalent conductance at infinite dilution for a strong electrolyte (NaCl)
12. Conductomeric titration of strong acid Vs strong base (Neutralization titration)
13. Conductomeric titration of silver nitrate Vs sodium chloride (Precipitation titration)
14. Determination of corrosion rate and inhibition efficiency of inhibitor for mild steel in hydrochloric acid medium.

(Any 12 experiments from the above list)

BMECTP 211 R01/MAMCTP 211 R01/MAUCTP 211 R01 /BMTCTP 211 R01
PERSONALITY DEVELOPMENT

NUMBER OF PERIODS: 15 **CREDIT: 01**

1	Self Introduction by students	1
2	Breaking the barriers	2
3	Impromptu	3
4	Creative Writing (Based on visual pictures)	1
5	Word Game (checking vocabulary power)	1
6	Ice Breaker (From Infosys Campus Connect)	1
7	Role Play	2
8	Letter Writing (Leave letter, Joining report, Acceptance to Offer)	1
9	Feed back responses (From Infosys Campus Connect)	1
10	Public Speaking (Extempore speech)	2