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B.Tech First Year curriculum and syllabus

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2013 Regulation

S. No.	CODE	SUBJECT	L	T	P	C
		Semester - I				
1	BEN13001	Technical English - I	2	0	0	2
2	BMA13001	Mathematics - I	3	1	0	4
	BMA13002	Bio Mathematics (for IBT)	3	1	0	4
3	BPH13001	Engineering Physics	3	0	0	3
4	BCH13001	Engineering Chemistry - I	3	0	0	3
5	BPE13001	Environmental and Health Science - I	2	0	0	2
6	BEE13001	Basic Electrical Engineering	3	0	0	3
7	BME13001	Basic Mechanical & Civil Engineering	3	0	0	3
		TOTAL CREDIT				**20**

S. No.	CODE	SUBJECT	L	T	P	C
		Semester - II				
1	BEN13002	Technical English - II	2	0	0	2
2	BMA13003	Mathematics - II	3	1	0	4
	BMA13004	Bio Statistics (for IBT)	3	1	0	4
3	BPH13002	Material Science	3	0	0	3
	BBT13001	Life Science (for IBT)	3	0	0	3
4	BCH13002	Engineering Chemistry - II	3	0	0	3
5	BPE13002	Environmental and Health Science - II	2	0	0	2
6	BEC13001	Basic Electronics Engineering	3	0	0	3
7	BME13002	Basic Engineering Graphics	2	0	2	3
8	BPH13L01	Physics Lab	0	0	3	1
9	BCH13L01	Chemistry Lab	0	0	3	1
10	BCS13L01	Programming & Multimedia Lab	1	0	2	2
11	BSEP13L01	Workshop & Project Lab	0	0	3	1
		TOTAL CREDIT				**25**
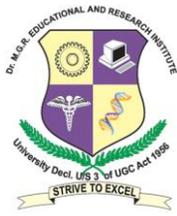
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BEN 13001	**TECHNICAL ENGLISH - I**	2 0 0 2

OBJECTIVES:
  The Syllabus aims at
➢ equipping the students for effective interaction with people in all situations both academic and professional
➢ preparing them for placement interviews
➢ strengthening the vocabulary for use in both technical and business situations
➢ To train learners in organized academic & professional writing.

UNIT I   **(6 Hrs)**
Vocabulary (meanings, synonyms, antonyms) – affixes (prefixes and suffixes) – word formation – nominal compounds , expanding using numbers and approximation – verbs (tenses , auxiliaries , modals) – concord – voice, impersonal passive voice – infinitives, gerunds – questions (wh , yes / no, tag)

UNIT II   **(6 Hrs)**
Prepositions , prepositional phrases , preposition + relative pronouns – phrasal verbs and idioms – adjectives , degrees of comparison – connectives – 'if' clauses – cause and effect –imperatives and requests – letter writing, formal, seeking permission to undergo practical training , letter to the editor , job application , calling for quotation , placing orders and complaints.

UNIT III   **(6 Hrs)**
Writing a set of instructions and recommendations – Reading articles from magazines and newspapers – extracting relevant information from the texts by skimming and scanning for specific information. Comprehension – Precis – Interpretation of tables and flow charts.

UNIT IV: (PRACTICAL COMPONENT)   **(6 Hrs)**
Listening
Speech sounds, pronunciation, word stress – role play - buying and selling a product – making arrangements for meeting-listening to monologues and short conversation based on a variety of sources including interviews, listening to people, listening to instructions, listening to longer texts to gather clues and prompts relating to purpose.

UNIT V (PRACTICAL COMPONENT)   **(6 Hrs)**
Speaking
Conducting and participating in meetings, compeering, welcome speech, vote of thanks, summing up the speech- greeting friends and strangers, situational conversations , asking for and giving information, agreeing and disagreeing.

Total No. Of Hrs : 30

TEXT BOOK
1. Dr.R.Pushkala, Dr.P.A.Sarada,. (2013)*A Textbook of Communication Skills-Orient Blackswan*, El DoradoWren & Martin, (2006) *Grammar and Composition*, Chand & co.

REFERENCES
1. McCarthy, Michael et.al (2011) *English Vocabulary in Use – advanced*, Cambridge University Press,
2. Hancock, Mark (2011) *English Pronunciation in Use*, Cambridge University Press,
3. Dutt P.Kiranmai (2008)*Basic Communication Skills,*Cambridge University Press

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BMA 13001	MATHEMATICS – I	3 1 0 4

(Common to all Branches of I year / I Semester B.Tech except IBT)

OBJECTIVES:

➢ To develop the skills of students in the areas of Algebra & Matrices which has numerous applications in engineering problems.

➢ To develop the Basic Mathematical Knowledge & Computational Skills of the students in the area of applied Mathematics

➢ To apply the concepts of partial differentiation and Trigonometry which are very essential for engineering study.

UNIT I: ALGEBRA (12 Hrs)

Binomial, Exponential, Logarithmic Series (without proof of theorems) – Problems on Summation, Approximation and Coefficients.

UNIT II : MATRICES (12 Hrs)

Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values – Cayley - Hamilton Theorem(without proof) – Orthogonal reduction of a symmetric matrix to Diagonal form.

UNIT III: TRIGONOMETRY (11 Hrs)

Expansions of $\sin n\theta$, $\cos n\theta$ in powers of $\sin\theta$ and $\cos\theta$ – Expansion of $\tan n\theta$ – Expansions of $\sin^n\theta$ and $\cos^n\theta$ in terms of Sines and Cosines of multiples of θ – Hyperbolic functions – Definition & separation into real and imaginary parts.

UNIT IV: DIFFERENTIATION (11 Hrs)

Basic concepts of Differentiation – Elementary differentiation methods – Implicit function – Parametric functions – Leibnitz theorem(without proof) – Maxima and Minima – Points of inflection.

UNIT V: FUNCTIONS OF SEVERAL VARIABLES (14Hrs)

Partial derivatives – Total differential – Differentiation of implicit functions – Taylor's expansion – Maxima and Minima by Lagrange's Method of undetermined multipliers – Jacobians.

Tutorial Hrs: 15 **Total No. of Hrs. : 60**

TEXT BOOK

1. T.Veerarajan (2002) Engineering Maths for I year (First Revised edition.) Tata McGraw Hill Publishing Co

2. Dr.S.P. Rajagopalan, Dr.A.Iyemperumal & Dr.S.Dhevarajan-An introduction to Engineering Mathematics for the I year – Kalki Publications.

REFERENCES

1. E .Kreyszig (2001),*Advanced Engineering Mathematics* (8th ed.), John Wiley and Sons (Asia) Pvt. Ltd

2. B.S. Grewal (2000), *Higher Engineering Mathematics* (35th ed.), Khanna Publishers.

3. P.Kandasamy, K.Thilagavathy and K. Gunavathy(2000), *Engineering Mathematics Vol. I* (4th Revised ed.), S.Chand & Co., Publishers.

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BMA 13002	**BIO MATHEMATICS**	3 1 0 4

OBJECTIVES:

➢ To develop the skills of students in the area of Matrices which has numerous applications in engineering problems.

➢ To introduce the basic mathematical concepts in the area of differentiation, integration.

➢ To introduce the numerical interpolation concepts.

UNIT I : MATRICES   **(11 Hrs)**

Elementary operations on Matrices – Inverse of a matrix – Solving simultaneous equations (two & three unknowns) using Cramer's rule.

UNIT II: DIFFERENTIATION   **(11 Hrs)**

Basic concepts of Differentiation – Elementary differentiation methods – Implicit function – Parametric functions – Maxima and Minima (simple problems).

UNIT III: INTEGRATION   **(12 Hrs)**

Basic concepts of integration – Methods of integration– Integration by Substitution – Integration by parts – Definite integrals – Properties of Definite Integrals – Problems on finding Area using single integrals (simple problems).

UNIT IV: INTERPOLATION   **(13 Hrs)**

Interpolation: Newton's forward, Newton's backward formulae – Newton's divided differences – Lagrange's polynomial (simple problems).

UNIT V: NUMERICAL DIFFERENTIATION AND INTEGRATION   **(13 Hrs)**

Numerical differentiation with interpolation polynomials (Newton's forward and backward only) – Numerical integration by Trapezoidal and Simpson's (both $1/3^{rd}$ & $3/8^{th}$) rules (simple problems).

Total no. of hrs. : 60

TEXT BOOK

1. Veerarajan.T, (2002)*Engineering Mathematics I Year* (First Revised ed.), Tata McGraw Hill.

2. Veerarajan.T, Ramachandran.T, *Numerical Methods with programs in C,* Tata McGraw Hill

Reference Books:

1. Shanti Narayanan, *Differential Calculus*, S.Chand & Co.

2. Shanti Narayanan, *Integral Calculus*, S.Chand & Co.

3. John Bird,(2010)*Basic Engineering Mathematics* (5th ed.), Elsevier Ltd.
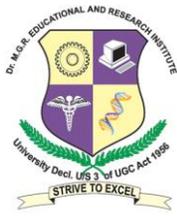
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BPH 13001	ENGINEERING PHYSICS	3 0 0 3

OBJECTIVES:

➢ The syllabus aims at imparting Fundamental concepts of physics required to Engineering & Technology

➢ To Enable the students to reorient the study of physics to suit their branches of and Engineering & Technology

UNITI: PROPERTIES OF MATTER   (**9 Hrs**)

Elasticity: Elastic nature of materials -Relation between three moduli (Relation only) –Twisting couple on a wire (derivation) – Shafts – comparison of Solid and hollow shaft - Bending moment – Depression of a cantilever - Determination of Young's modulus by depression of a cantilever - Uniform and non uniform bending (Theory and Experiment) – I form of girders.

Viscosity: Introduction – Definition - Derivation of Poiseuille's formula – Determination of coefficient of viscosity of liquids – Ostwald`s viscometer – Applications.

UNITII: HEAT   (**9 Hrs**)

Thermal conduction : Thermal conductivity (k) – Forbe's and Lee's disc methods (theory and experiment) – Conduction of heat through two layers of matter with different thermal conductivities - Radial flow of heat – Thermal conductivity of glass and rubber - Thermal insulation of buildings

Thermal radiation : Black body radiation –Emission and absorption – Statement and explanation (no derivation) of Stefan's law, Wien's law, Rayleigh-Jean's law and Planck's law of Radiation.

UNIT III: THERMODYNAMICS   (**9 Hrs**)

Introduction – Thermodynamic systems - Laws of thermodynamics – Carnot cycle as heat engine and refrigerator – Refrigerating machines – Electrolux refrigerator – Frigidaire – ideal otto and diesel engines – Calculation of efficiency of otto and diesel engines - Concept of entropy – Entropy of a reversible and irreversible process - Entropy Temperature diagram of Carnot cycle

UNIT IV: ACOUSTICS AND U;TRASONICS   (**9 Hrs**)

Acoustics :Doppler effect - Applications of Doppler principle – MAC number – Sonic boom - Characteristics of musical sound – Weber Fechner law – Decibel, Phon, Sone.

Acoustics of Buildings: Reverberation – Reverberation time – Derivation of Sabine`s formula for reverberation time (Jager`s method) - Absorption coefficient and its determination – Factors affecting acoustics of buildings and its remedial measures – Ultrasonics: Introduction - Production of Ultrasonic waves using Piezoelectric crystal and Magnetostriction method – Acoustic grating – Determination of velocity of Ultrasonic – Application of Ultrasonic in industry & medicine.

UNITV: WAVE OPTICS AND LASER & FIBER OPTICS   (**9 Hrs**)

Wave Optics: Air wedge – Testing of optical flatness – Antireflection coating – Michelson interferometer – Types of fringes – Determination of wavelength of monochromatic source and thickness of thin transparent sheet

Laser: Principle - Characteristics – Einstein`s coefficient (A&B) – Ruby laser – He -Ne laser – Co_2 laser, semiconductor laser – Application of lasers in industry & medicine

Fiber Optics: Introduction – Total Internal Reflection - Light propagation characteristics – Acceptance angle and Numerical Aperture - Types of fibers – Optical fibers as wave guides and sensors (PMT & IMT sensors).

Total No. of Hrs : 45

TEXT BOOK

1. N.S.Shubhashree & R.Murugesan., "*Engineering Physics*",   Sreelakhsmi Publishers.
2. P.K. Palanisamy, "*Engineering Physics*", Scitech Publications

REFERENCES

1. R.K. Gaur & S.L. Gupta, (1988), "*Engineering. Physics*", Dhanpat Raj &Sons, VI Edition
2. M. Arumugam, "*Engineering Physics*", Anuradha Publication.

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BCH 13001   **ENGINEERING CHEMISTRY – I**   **3 0 0 3**

OBJECTIVES:
- The make students correlate theoretical principles with application oriented chemistry.
- To impart basic knowledge to learners about the quality of water and its treatment that is essential for all streams of Engineers.
- To make learners understand the theory behind polymerization and the myriad applications of plastics in the engineering field.
- To enhance the knowledge of the learners in chemical thermodynamics, dynamics of chemical processes and Electrodics.

UNIT I: CHEMICAL THERMODYNAMICS   (**8 Hrs**)

Introduction – Importance of thermodynamics – Definitions – System - Surrounding – State function – Path function – Extensive and intensive properties. Laws of thermodynamics – I law – Significance – Mathematical formulation and its applications. II law – Need for the II law – Enthalpy – Entropy – Gibbs free energy – Helmholtz free energy - Spontaneity and its criteria – Maxwell relations – Gibbs -Helmholtz equation (relating E & A) and (relating H & G) – Van't Hoff equations.

UNIT II:DYNAMICS OF CHEMICAL PROCESSES   (**8 Hrs**)

Basic concepts – Definitions – Kinetics – Order – Molecularity – Rate constant – first, second third & zero order reactions with examples – Half life period – Effect of temperature on reaction rate – Energy of activation – Arrhenius equation – Collision theory – Transition state theory.

UNIT III: ELECTROCHEMISTRY   (**9 Hrs**)

Conductance – Types of conductance and its Measurement – Electrochemical cells – Electrodes and electrode potential – Nernst equation – EMF measurement and its applications – Types of electrodes – Batteries – Fuel cells – Principles of chemical and electrochemical corrosion – Corrosion Control.

UNIT IV: TECHNOLOGY OF WATER   (**12 Hrs**)

Water quality parameters – Definition and expression – Estimation of hardness (EDTA method) – Alkalinity – Boiler feed water – Water softening processes – Internal and external conditioning – Desalination processes – Domestic water treatment.

UNIT V: POLYMER SCIENCE   (**8 Hrs**)

Monomer – Functionality – Degree of polymerization – Classification – Types of polymerization – addition, condensation and copolymerization with examples – Mechanism – free radical and ionic – Thermoplastics and thermosetting plastics – Processing of plastics – Compression moulding, injection moulding and extrusion processes.

                                                                                        Total No. of Hrs: 45

TEXT BOOKS
1. Engineering chemistry–R.Sivakumar and N.Sivakumar, Tata McGraw Hill publishers (2009)
2. Dr. S. Nanjundan & C. Sreekuttan Unnithan, "*Applied Chemistry*", Sreelakshmi Publications.

REFERENCES
1. M.R. Balasubramanian, S. Krishnamoorthy and V. Murugesan, (1993) "*Engineering Chemistry*", Allied publishers Ltd.
2. V. Sadasivam, (1999), "*Modern Engineering Chemistry – A simplified approach*", Kamakya Publications.
3. P.C. Jain & Monika Jain, (2000) "*Engineering Chemistry*", Dhanpat Rai publishing Co., (Ltd.)

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BPE13001   **ENVIRONMENTAL AND HEALTH SCIENCE – I**   **2 0 0 2**

OBJECTIVES:
- To provide knowledge on 'Body Systems' and 'Health Factors'
- To study the nutritional requirements at various stages of life.
- To give an overview on the environmental awareness and the study of natural resources
- To familiarize the concepts of 'Ecosystem' and 'Biodiversity'.

UNITI : HEALTH FACTORS   **(6 Hrs)**

Chapter - I

Concepts and Dimensions of Health

Changing concepts – Biomedical – Ecological – Psychological – Holistic Concepts - Definitions of Health – Philosophy of Health – **Dimensions -** Physical – Mental – Social – Spiritual – Emotional – Vocational

Chapter - II

Determinants of Health

Biological Factors – Heredity - Environmental Factors– Medical care facilities – Living Space and Housing - Safe water – Food and Nutrition – Sanitation - Socio cultural factors – Social Environment – Economic Status - Ways of living – Personal health Practices - Importance of health to Individuals and Community .

Chapter - III

Human Growth and Development

General Principles – Continuous and orderly process – Individual differences – Directions of development – Development from general to specific and simple to complex – Variations in growth rate – Critical Periods- Influencing Factors – Heredity – Nutrition – Endocrine Glands – Rest Relaxation and Sleep – Exercises – Diseases.

Chapter - IV

Characteristics of Boys and Girls during Adolescence

Growth Pattern – Physical - Height – Weight- Changes in skeletal structures and body proportions – Physiological – Growth of heart- Muscular strength and coordination – Effects of Physical status upon adolescents adjustment - Mental – Ability to Concentrate – Ability to memorize – Ability to think Logically – Specific Adolescent Interests - Personal interests - Personal Social Interests – Vocational Interests –Emotional problems of adolescents and how to adjust with them.

Chapter - V

Health Behaviours

Definition – Health Habit – Primary prevention – Barriers to modifying poor health behaviours – Instability of health behaviours - Self control of behavior – Self reinforcement – Family and Educational Institution as venues for Health-Habit modification.

UNIT II: BODY SYSTEN RESOIBSES TO EXERCISES   **(6 Hrs)**

Chapter – VI

Cardiovascular System

Vital Signs – Responses of Heart rate, Blood Pressure, Cardiac output and Stroke Volume to exercise - ECG Causes of coronary artery disease – Role of Cholesterol in heart disease – Heart attack – Hypertension – cause of heart failure.

Chapter - VII

Respiratory System

Respiratory muscle and training – Ventilation during exercise – control of ventilation – The common cold and its causes – Bronchitis – Asthma

Chapter - VIII

Nervous System

The nervous system - Central and peripheral nervous system - Neuromuscular coordination – reaction time – EEG – Headaches – Pain – Stroke

Chapter - IX

Digestive System

Appetite improvement – Stress reduction – improvement in general function – Irritable Bowel Syndrome - Dysentery — Hepatitis.

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Chapter - X
Sensory Organs and Oral Hygiene
Astigmatism - Computer Eye Fatigue - Removal of speck of dirt from eye – Avoiding Eye Fatigue – Long and Short sightedness- Glaucoma- Swimmer's ear – Earwax – Sneeze – Running nose – Sinus Attacks - Strep throats – Snoring – Role of Saliva – Mouth Ulcers.

UNIT III: DIETING AND FASTING   **(6 Hrs)**
Chapter - XI
Nutritional Status
Nutritional Intake – Heredity – Environment – Family Size – Rest, Relaxation and Sleep – Cultural influences, Traditional customs and habits, Religion, Food fads, Cooking practices – Medicinal values of food – psychological factors – Miscellaneous – Malnutrition – under nutrition.

Chapter - XII
Nutritional Needs
Essential Nutrients – Energy – Functions of Nutrients – Proteins – Minerals – Vitamins – Carbohydrates – Fats – Food Types

Chapter – XIII
Balanced Diet
Definition - Components of energy requirements – During Adolescence – During Pregnancy – During Lactation – Obesity – Hazards – Prevention and Control – Exercises and Eating - Cessation of Exercises and eating.

Chapter – XIV
Yogic Diet
Functions of Food – Growth – Repair – Energy – Protection from Disease – Restraint in eating – Our Food Habits – Fried Vs Natural Food – Drinking Water with Food – Appetite loss and non-stop eating – Sugar Vs Jaggery – Tea and Coffee – Tobacco and Liquor – Yogic Diet – Ideal Yogic Foodstuffs.

Chapter - XV
Fasting
Principle – Physiological Effects – Cleansing – Detoxification – Types – Dry – Water – Juice – Classification - The Techniques and Principles – The process and Benefits.

UNIT IV: INTRODUCTION TO ENVIRONMENTAL STUDIES   **(6 Hrs)**
Definition, scope and importance - Need for public awareness– 2**. water resources**: use and over-utilization of surface and ground water: 3. **environmental effects of extracting**, using and exploitation of mineral resources– energy resources: 4. **growing energy needs**, renewable and non renewable energy sources, use of alternate energy sources – role of an individual in conservation of natural resources – 5. **equitable use of resources** for sustainable lifestyles.

UNIT V : ECOSYSTEMS AND BIODIVERSITY   **(6 Hrs)**
1. **Concept of an ecosystem** – **2. structure and function of an ecosystem** – producers, consumers and decomposers – 3. **energy flow in the ecosystem** – ecological succession – food chains, food webs and ecological pyramids – 4. **Types of Ecosystems.** introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – **5. Introduction to biodiversity** – definition: genetic, species and ecosystem diversity.

Total No. of Hrs: 30

TEXT BOOKS:
1. Vairamani, S and K. Sankaran(2003), *Health Science for Engineers***.** KPSV. Computers and Offset Printers

2. Vairamani, S. and Dr. K. Sankaran(2011). *Fitness and Health,*KPSV Publications, 5th Edition

REFERENCE BOOKS
1. Environmental studies by IFTHIKARUDEEN.A, Durga prasad.K , K.Pandian and Prabakaran.

2. Satya paul, Dr.Yogasanas & Sadhana, New Delhi, Pushpak Mahal,2003.

3. Ashwin Bharadwaj, Stress, New Delhi: Goodwill Publishing Hug.2006
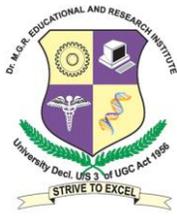
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BEE 13001   **BASIC ELECTRICAL ENGINEERING**   **3 0 0 3**
OBJECTIVES:
- ➢ To understand the concepts of circuit elements, circuit laws and coupled circuits.
- ➢ To understand the concepts of active, reactive and apparent power and power factor
- ➢ To acquire knowledge on conventional & non conventional energy production.
- ➢ To gain information on measurement of electrical parameters.

UNIT I: DC CIRCUIT   **(9 Hrs)**
Introduction to electrical circuits(Electrical quantities, ohms law ,Kirchoff's law, Method of solving a Circuits by Kirchhoff's Laws, series & parallel connections-problems, voltage division & current division techniques-problems)-**Loop Analysis** of resistive circuit in the context of dc voltages and currents(problems) -**Node analysis** of resistive circuit in the context of dc voltages and currents(problems)- **Wye (Y) – Delta (Δ) or Delta (Δ) – Wye (Y) transformations**(simple problems).

UNIT II:AC CIRCUIT   **(9 Hrs)**
Generation of single phase ac and fundamentals (average and root mean square (rms)values, of alternating waveforms such as voltage/current)   -**Representation of sinusoidal quantities in phasor with j operator**(transformation from rectangular to polar form) -Steady state analysis of series circuits(R, L, C, R-L, R-C and R-L-C-also phasor diagrams)-**Concept of apparent, active and reactive power**-**Generation of three-phase voltage**,**Solution of three-phase balanced circuits**(balanced star connected load, balanced delta connected load) - **Measurement of three-phase power**(two watt-meter method)

UNIT III: MACHINES   **(9 Hrs)**
Magnetic circuits (Quantities, Electromagnetic Induction, Magnetic Effects of Electric Current, Faraday's law of electromagnetic induction, Lenz's law, statically and dynamically induced EMF)
D.C machines(D.C motor,D.C generator- Construction and Principle of operation)- **Transformer**(ideal transformer- Construction and Principle of operation, Eddy current & hysteresis losses)

UNIT IV: MEASURING INSTRUMENTS   **(9 Hrs)**
DC and AC measuring instruments (Classification of Instruments, Permanent magnet moving coil (PMMC), Moving-iron (MI)- Construction and Principle of operation**)- electrodynamics type instruments**(electro-dynamometer instruments- ammeter, voltmeter and wattmeter)-**single-phase induction type energy meter**
Transducers(photo-electric, piezo-electric, photo voltaic, Hall effect, LVDT,Strain-gauge)

UNIT V: BASICS OF POWER SYSTEM   **(9 Hrs)**
Generation, of electric power(Thermal, hydro ,Wind and Solar – Schematic Representation and Working Principle), **transmission   and distribution of electric power** (Introduction ,Types of Transmission and Distribution, Schematic Representation of substation), **Single line representation of power system**
                                                                          Total No. of Hrs: 45

TEXT BOOKS
  1. D P Kothari, I J Nagrath*, Basic Electrical Engineering*, Second Edition, , Tata McGraw-Hill Publisher.
  2. I Mckenzie Smith, *Hughes Electrical Technology,* Seventh Edition, Addison-Wesley Longman Publisher.
REFERENCES
  1. R.Muthusubramanian, S.Salivahanan, K A Muraleedharan, *Basic Electrical, Electronics And Computer Engineering*, Second Edition, ,Tata McGraw-Hill publisher.
  2. Abhijit Chakrabarti, Sudipta Nath, Chandan Kumar Chanda , *Basic Electrical Engineering*,Tata McGraw-Hill Publisher.
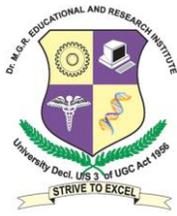
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BME 13001   **BASIC MECHANICAL & CIVIL ENGINEERING**   **3 0 0 3**

OBJECTIVES:

➢ To familiarize the learners in manufacturing processes and machining operations.

➢ To explain the different type of boilers used.

➢ To introduce building materials and types of constructions.

➢ Basic ideas of civil constructions

UNIT I: THERMAL ENGINEERING   (8 Hrs)

Classification of internal combustion engine – two stroke, four stroke petrol and diesel engines. Classification of Boilers – Cochran boiler – Locomotive boilers – Power plant classification – Working of Thermal and Nuclear power plant.

UNIT II: MANUFACTURING PROCESS   (8Hrs)

Metal forming processes – Rolling, forging, drawing, extrusion and sheet metal operations- fundamentals only. Metal Joining processes – Welding - arc and gas welding, Soldering and Brazing. Casting process – Patterns - Moulding tools - Types of moulding - Preparation of green sand mould -Operation of Cuppola furnace.

Unit III:MACHINING OPERATIONS   (7 Hrs)

Basics of metal cutting operations – Working of lathe parts of lathe-Operations performed on lathe. Milling machine – Horizontal and vertical milling machine - Milling operations. Drilling machine – Classification – Radial drilling machine - Twist drill nomenclature.

UNIT IV : MECHANICS   (9 Hrs)

Stresses and Strains – Definition – Relationship – Elastic modulus – Centre of gravity – Moment of Inertia – Problems. (Simple Problems Only).

UNIT V : BUILDING MATERIALS AND CONSTRUCTION   (6 Hrs)

Materials:

Brick - Types of Bricks - Test on bricks - Cement – Types, Properties and uses of cement – Steel - Properties and its uses – Ply wood and Plastics.

Construction:

Mortar – Ingredients – Uses – Plastering - Types of mortar - Preparation – Uses – Concrete – Types – Grades – Uses – Curing – Introduction to Building Components (foundation to roof) – Masonry – Types of masonry (Bricks & Stones)

UNIT VI : ROADS, RAILWAYS, BRIDGES & DAMS   (7 Hrs)

Roads – Classification of roads – Components in roads – Railways -Components of permanent way and their function – Bridges – Components of bridges – Dams – Purpose of dams – Types of dams.

Total No. of Hrs: 45

TEXT BOOK

1. S. Bhaskar, S. Sellappan, H.N.Sreekanth,, (2001), "*Basic Engineering*" –Hi-Tech Publications

2. K. Venugopal, V. Prabhu Raja, (2002), "*Basic Mechanical Engineering*", Anuradha Publications.

3. K.V. Natarajan (2000), *Basic Civil Engineering,*Dhanalakshmi Publishers

4. S.C. Sharma(2002),*Basic Civil Engineering,* Dhanpat Raj Publications

REFERENCES

1. PR.SL. Somasundaram, (2002), "*Basic Mechanical Engineering*" –, Vikas Publications.

2. S.C. Rangawala(2001), *Building Material and Construction,* S. Chand Publisher

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BEN 13002   **TECHNICAL ENGLISH –II**   **2 0 0 2**

OBJECTIVES:
- to improve conversational skills among students
- to develop among them interpersonal and social skills
- to equip them to work successfully in global, professional and business situation

UNIT I :   **(6 Hrs)**
Verbal analogy- cloze - completion of sentences suitably- picking out the odd one from a series – homophones - words often confused – collocation - register, (formal and informal)-using ellipses in dialogue.

UNIT II: **(6 Hrs)**
Sequencing jumbled sentences using linguistic clues (e.g. reference words and linkers) and following semantic clues for prepositional development –one sentence definition and extended definition-description, defining, describing an object/device/instrument/machine using appropriate discourse markers- editing a passage (correcting the mistakes in punctuation, spelling and grammar).

UNIT III :   **(6 Hrs)**
Paragraph writing (with due emphasis on features such as topic sentence and its role , unity, coherence and cohesive devices) - essay writing – newspaper reports on accidents, thefts and festivals – dialogue writing.

UNIT IV :   **(6 Hrs)**
Inferential comprehension-predicting the content from the title-skimming the text, understanding the gist, identifying the topic sentence and its role in each paragraph, scanning, inferring/identifying lexical and contextual meaning, reading to identify the main content and answer comprehension questions - note making, understanding the discourse coherence and organization of texts, learning the use of words - comparing and contrasting – classifying the data, analyzing/interpreting the data in bar and pie charts using technical vocabulary.

UNIT V : (PRACTICAL COMPONENTS) LISTENING & SPEAKING   **(6 Hrs)**
Group discussions- presentation , different types ,sales presentation , project presentation– preparation for meeting , writing agenda and writing minutes – preparing for interviews , etiquette, body language , dress code – mock interviews – writing business reports on conferences and meetings.

                                                                Total No. of Hrs : 30

TEXT BOOK
1. Dr.R.Pushkala, Dr.P.A.Sarada,. (2013) *A Textbook of Communication Skills-Orient Blackswan*, El Dorado
References
1. McCarthy, Michael et. al - English Vocabulary in Use – advanced – Felicity O'Dell, Cambridge University Press,2011
2. Hancock, Mark, English Pronunciation in Use –,Cambridge Univ.Press,2011
3. Dutt P.Kiranmai et. al,(2008) *Basic Communication Skills,*Cambridge University Press, & Martin,(2006) *Grammar and Composition* , Chand & Co,
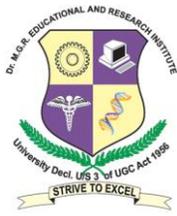
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BMA 13003	MATHEMATICS II	3 1 0 4

(Common to all Branches of I year / II Semester B.Tech except IBT)

OBJECTIVES:

➢ To solve differential equations which form the mathematical models of engineering problems

➢ To provide an insight into integral & vector calculus and their applications.

➢ To understand 3d images.

UNIT I : INTEGRATION (11 Hrs)

Basic concepts of integration – Methods of integration– Integration by Substitution – Integration by parts – Definite integrals– Properties of definite integrals – Problems on finding Area and Volume using single integrals (simple problems).

UNIT II: MULTIPLE INTEGRALS (12 Hrs)

Double integral in Cartesian and Polar Co-ordinates – Change of order of integration – Triple integral in Cartesian Co-ordinates – Spherical Polar Co-ordinates – Change of variables (simple problems).

UNIT III : ORDINARY DIFFERENTIAL EQUATIONS (11 Hrs)

First order differential equations – Second and higher order linear differential equations with constant coefficients and with RHS of the form: e^{ax}, x^n, Sin ax, Cos ax, e^{ax} f(x), x f(x) where f(x) is Sin bx or Cos bx – Differential equations with variable coefficients (Euler's form)(simple problems).

UNIT IV : THREE DIMENSIONAL ANALYTICAL GEOMETRY (13 Hrs)

Direction Cosines and Ratios – Equation of a straight line – Angle between two lines – Equation of a plane – Co-planar lines – Shortest distance between skew lines – Sphere – Tangent plane.

UNIT V : VECTOR CALCULUS (13 Hrs)

Scalar and Vector functions – Differentiation – Gradient, Divergence and Curl – Directional derivatives – Irrotational and Solenoidal fields– Line, Surface and Volume integrals – Green's, Stoke's and Gauss divergence theorems (statement only) – Verification.

Total no. of Hrs.   : 60

TEXT BOOKS:

1. T .Veerarajan(2002) , *Engineering Mathematics for I Yr. (First Revised ed.)*, Tata McGraw Hill Publishing Co., New Delhi,

2. Dr.S.P. Rajagopalan, Dr.A.Iyemperumal & Dr.S.Dhevarajan-An introduction to Engineering Mathematics for the I year – Kalki Publications.

REFERENCES

1. E .Kreyszig (2001), *Advanced Engineering Mathematics* (8th ed.), John Wiley and Sons (Asia) Pvt. Ltd

2. B.S. Grewal (2000), *Higher Engineering Mathematics* (35th ed.), Khanna Publishers.

3. P.Kandasamy, K.Thilagavathy and K. Gunavathy(2000), Engineering   *Mathematics Vol. I (4th Revised ed.)*, S.Chand & Co.,

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BMA 13004	BIO STATISTICS	3 1 0 4

(For IBT Students)

OBJECTIVES:

➢ To introduce the techniques of data analysis.

➢ To impart the basic statistical concepts of Testing of Hypothesis

➢ To introduce the concepts of design of experiments which has numerous applications in Biotechnology Research

UNIT I (11 Hrs)

Variables - Univariate Data - Frequency Distribution - Measures of Central Tendency – Mean - Median & Mode – Quartiles - Measures of Dispersion - The Range-Quartile Deviation-Standard Deviation - Relative Measures of Dispersion - Coefficient of Variation - Quartile Coefficient of Variation.

UNIT II (11 Hrs)

Moments - Measures of Skewness & Kurtosis - Bivariate Data - Correlation & Regression.

UNIT III (11 Hrs)

Inferential Statistics **-** Probability Concepts - Random Variable - Mathematical Expectation – Sampling - Simple Random Sampling - Stratified Random Sampling - Systematic Random Sampling - Concepts only.

UNIT IV (14 Hrs)

Tests of Significance - Large Sample Tests – Mean – Proportions - Small Sample Tests - t, F & Chi - Square Tests - Independence of Attributes -Goodness of Fit.

UNIT V (13 Hrs)

Analysis of Variance - One–Way & Two–Way Classifications - Design of Experiments - Completely Randomized Block Design - Randomized Block Design – Latin Square Design.

Total no. of Hrs. : 60

TEXT BOOK

1. Gupta S.P. (2003) *Statistical Methods*, Sultan Chand & Co., New Delhi
2. P.R.Vittal & V.Malini, Statistical and numerical methods, Margham Publications.

REFERENCE BOOKS

1. D.C. Sancheti. & V.K. Kapoor(2003) *Statistics - Theory, Methods & Applications,* Sultan Chand& Co.,
2. S.C. Gupta & V.K. Kapoor(2003), *Fundamentals of Mathematical Statistics*,Sultan Chand & Co.,

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BPH 13002	MATERIAL SCIENCE	3 0 0 3

OBJECTIVES:

➢ To familiarize the learners to project theoretical concepts in to application oriented study.
➢ To show the relevance of material science in the new age technologies.

UNIT I : CRYSTALLOGRAPHY   (9Hrs)

Space lattice – Unit cells – Bravais space lattices – Lattice Planes – Miller indices – Calculation of number of atoms per unit cell – Atomic radius – Coordination number and packing factor for simple cubic, BCC, FCC, HCP and diamond structures – X – Ray diffraction – Bragg's law – Symmetry elements of a crystalline solid.

UNIY II : CONDUCTING MATERIALS   (9 Hrs)

Introduction – Classical free electron theory – Electrical & Thermal conductivity - Wiedmann Franz law – Quantum free electron theory - Electron energies in metals and Fermi energy – Density of states –Zone theory - Periodic potential – 1D Scattering of electrons in periodic potential - Qualitative approach of energy bands in solids – Brillouin zones.

UNIT III : SEMICONDUCTORS AND SUPERCONDUCTORS   (9 Hrs)

Bonds in semiconductors – Types – Carrier concentration in intrinsic and extrinsic semiconductors – Variation of Fermi level with temperatures and concentration of donor/acceptor atoms – Variation of carrier concentration with temperature in P & N types – Hall effect - Super conductivity – Occurrence – Properties – Meissner effect.

UNIT IV : MAGNETIC & DIELECTRIC MATERIALS   (9 Hrs)

Magnetism : Introduction – Definitions – Types of Magnetism – Heisenberg's interpretation – Domain theory – Hysteresis - Magnetic tapes, floppy and bubble memory

Dielectrics : Terms and definitions – Different types of polarization(qualitative only) – Internal field – Clausius Mossotti equation – Dielectric loss – Dielectric breakdown – Uses of dielectric materials (Capacitors & Transformers)

UNIT V : NEW MATERIALS & NDTNew Materials & NDT   (9 Hrs)

New Materials : LED – LCD – Metallic glasses – Nano materials & their applications – shape memory alloys - Biomaterials.

NDT : Liquid Penetrant Method – Ultrasonic flaw detection (Block Diagram) – X ray Radiography (Displacement Method) – X ray Fluroscopy – Merits and demerits of each methods.

TEXT BOOKS   **Total No. of Hrs. : 45**

1. P.K.Palanisamy, Materials *science* , SciTech Publication.
2. V. Rajendran & Marikani(2004), *Materials Science*, Tata McGraw Hill

 REFERENCE BOOKS

1. V. Arumugam(2003), *Materials Science*, Anuradha Agencies,
2. V.S.R. Murthy, A.K. Jena K.P. Gupta & G.S. Murthy (2003),*Structure and Properties of Engg. Materials*, Tata Mc Graw Hill
3. William F. Smith (1998), *Foundations of Materials Science & Engineering*, Tata Mc Graw Hill.

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BBT13001   **LIFE SCIENCES FOR ENGINEERS (FOR IBT)**   **3 0 0 3**

OBJECTIVES:

➢ To understand the basic structures of animal and plant cells and the functions of organelles. Give an overview of structure and bio chemistry of carbohydrates, proteins, fats, vitamins etc.
➢ To understand the operon concept, give transcription and translation and cloning.
➢ To acquire knowledge of biological techniques
➢ Introducing the study of various biochemical cycles.

Unit I : UNDERSTANDING CELLS AND CYTO–ORGANELLES   **(9 hrs)**

Introducing to cell biology, cells and their organelles, plant cells and animal cells, function of cell organelles, Introduction to plant and animal cell cultures. Industrial applications of plant and animal cell cultures. Introduction to catabolism, anabolism and a overview of metabolism. Basic study of biochemistry of carbohydrates, proteins, fats and vitamins and their metabolic importance, electron transport chain and its function Role of nucleotides and nucleosides in building DNA and RNA.

Unit II : GENETICS AND THEIR ROLE IN INDUSTRIAL BIOTECHNOLOGY   **(9 hrs)**

A basic understanding of operon concepts, Fundamentals of DNA synthesis, gene transcription and translation, restriction enzymes, restriction digestion and mapping, a basic understanding of cloning, its advantages and disadvantages, role of plasmids in cloning.

Unit III : BIOLOGICAL TECHNIQUES   **(9 hrs)**

Basic understanding of the cell and protein analytical techniques including, 2 – d SDS – gel electrophoresis, agarose gel electrophoresis, preparation of mini – preps. Protein estimation by Bradford / Lowry, theoretical application of ELISA techniques. Chromatographic purification and separation of cellular proteins.

Unit IV : BIOTECHNOLOGICAL PROCESSES   **(9 hrs)**

Basic understanding and study of process involved in production of antibiotics, amino acids, hormones, antibodies, sugars carboxylic acids and enzymes, understanding of the fermentation involved in these processes and study of one example under each product with reference to medium used, types of fermentation, upstreaming and down streaming operations.

Unit V : TUTORIALS   **(9 hrs)**
Microscopy – Tutorial Lectures

Total No. of Hrs. : 45

TEXT BOOKS:

1.   Eldon D. Enger., Frederick C. Ross., "Concepts in Biology". Tenth Edition, Tata Mc Graw – Hill Edition, (2004). Lehiniger A.L., Nelson D.L., Cox M.M., "Principle of Biochemistry", CBS Publications, (1993).

REFERENCE BOOKS:

1.   Ansubel FM Brent R, Kingston RE, Moore DD, "Current protocols in Molecular Biology", Greene Publishing Associates, NY (1988).
2.   HD Kumar, "Text Book on Biotechnology", EWP, (2002).
3.   Talaro K., Talaro A Cassida Pelzar and Reid, "Foundations in Microbilogy", W.C. Brown Publishers, (1993).
4.   Pelczar M.J., Chan. ECs and Krieg Nr, "Microbiology" TataMcGraw Hill Edition, New Delhi, India**.** (2000)

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BCH 13002   **ENGINEERING CHEMISTRY – II**   **3 0 0 3**

OBJECTIVES:

- To introduce the chemistry of engineering materials such as lime, cement, ceramics, adhesives, lubricants and nano materials.
- To help students understand the chemistry behind formation of alloys, extractions of metals and powder metallurgy.
- To familiarize students about the use of a variety of fuels and their manufacture. Also to provide basic knowledge on explosives. To enrich the knowledge of students on Analytical Techniques

UNIT I : PHASE EQUILIBRIA   **(8Hrs)**
Introduction – Definition of terms involved in phase rule – Derivation of Gibbs phase rule – Applications to one component system – water system. Binary system – Eutectic system – Pb – Ag system, Bi – Cd system – Thermal analysis – Cooling curves.

UNIT II : SPECIALITY MATERIALS   **(9Hrs)**
Cement & Lime – Manufacture – Chemistry of setting and hardening special cements.
Lubricants – Requirements of good lubricants – Mechanism – Properties of lubricants – Classification – Examples.
Ceramics – characteristics – properties – types – special ceramics-Refrigerants – preparation – properties – examples. Adhesives – classification – types of adhesive action – examples. Nano materials – properties. carbon nano tubes – properties, fabrication – carbon arc method, laser vapourisation method.

UNIT III : EXTRACTIVE METALLURGY AND ALLOYS   **(8Hrs)**
Extraction of Uranium, thorium & Tungsten. Alloys – need for alloying, Non – ferrous alloys – Brass, Bronze, Bell metal, Alnico, Duralumin, Dutch metal, Invar, Nichrome, Solder – composition and uses. Bearing alloys – properties – examples. Powder metallurgy – principles – compacting and sintering methods application – advantages.

UNITIONT IV : FUELS & COMBUSTION   **(10Hrs)**
Introduction – classification – Calorific value – GCV, LCV. Solid fuels – Varieties of coal, Analysis – proximate & ultimate analysis. Carbonization of coal – manufacture of metallurgical coke. Liquid fuels – Refining of petroleum, Cracking – Thermal and catalytic. Synthesis of petrol – Fischer Tropsch and Bergius. Knocking – Leaded petrol – Octane number, cetane number. Reforming. Gaseous fuel – natural gas, producer gas, water gas, coal gas, bio gas, LPG –Composition, production and uses Combustion: Theoretical air calculation of fuels . Flue gas analysis – Orsat's apparatus. Explosives: Introduction – Classification - Preparation , Properties & Uses of some common explosives– TNT, cyclonite, GTN, PETN.

UNIT V : ANALYTICAL TECHNIQUES   **(10Hrs)**
Absorption and Emission Spectrum - Beer - Lambert's law. Visible and UV Spectroscopy – instrumentation – Block diagram - working. IR Spectroscopy – instrumentation - Block diagram – molecular vibrations – stretching and bending – H_2O, CO_2. Chromatographic techniques – column, thin layer and paper.

Nuclear Chemistry Basic concepts – Radio activity – Group displacement – Nuclear decay – Half life period – Nuclear fission and fusion – Nuclear reactors – Application of radio activity.

TEXT BOOKS: **Total no. of Hrs. : 45**

1. C. Sreekuttan Unnithan, Dr. T. Jayachandran & P. Udayakala(2004), *Engineering Chemistry*, Sreelakshmi Publications
2. P.C. Jain & Monika Jain(2000)., "*Engineering Chemistry*", Dhanpat Rai publishing Co., (Ltd)

REFERANCE BOOKS

1. B. R. Puri & L.K. Sharma(2000), *Principles of Physical Chemistry*, Shobanlal Nagin & Co.,
2. B.K. Sharma(2001), *Industrial Chemistry*, Goel Publishing House
3. R.D. Madan (2002), *Inorganic Chemistry*, S. Chand & Co.,.

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BPE 13002	ENVIRONMENTAL AND HEALTH SCIENCE – II	2 0 0 2

OBJECTIVES:

➢ Achieving physical wellbeing through planned exercises

➢ Achieving mental well being through meditation, Yoga and Breath control

➢ To acquire knowledge on pollution, its causes and prevention.

➢ Learn to reduce, Reuse and Recycle.

UNIT I : EXERCISES AND SOFT SKILLS   Chapter – XVI   (6 Hrs)

Ever Increasing world of Stress:

Coping with stress through non-drug methods – relaxation – Exercise – Walking – Yoga – Meditation – Biofeedback – Recreation – Leisure, Health and Stress – Breathing Control – Muscle relaxation

Chapter – XVII

Physical Exercises

Mobility Exercises - Single – Standing, Sitting, jumping, Turning – Partners – Pushing, Pulling, Chasing, Racing, Carrying and lifting – Dhands – Baithaks – Burpee – Squat Jumps – Sit ups – Pull-ups – Push-ups, Stretching - Aerobics and Anaerobic - In the presence of Oxygen – Types of Activities – In the absence of Oxygen – Types of activities - Fitness Components – Speed – Strength – Power – Endurance – Agility – General Motor Ability – Balance – Kinesthetic Perception – Flexibility – Posture – Reaction time.

Chapter – XVIII

Exercise for Cardio Vascular Fitness

Fitness Progression level – Cycling – Running – Swimming – Walking – Rope Skipping & Stationary Running – Stair Climbing and Bench Stepping

Chapter – XIX

Useful Tips for a Healthy Exercise Programme

Keep your Motivation on a permanent high – Starting a Afresh after an Unavoidable Break – Selecting the right clothes – Eliminate Smoking – Exercise to match your age – Your Endurance Potential

Chapter – XX

Exercises for Various Age Groups

6 to 10 years – 10 to 14 years – 14 to 20 years – 20 to 25 years – 25 to 35 years – 35 to 50 years – 50 years and above.

UNIT II : MENTAL HEALTH   (6 Hrs)

Chapter – XXI

Yoga

Yoga as a Science - Steps – Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana and Samadhi - Important considerations – Physical condition – Right Advice – Age and Sex – Place and Surroundings – Time – Diet – Interval – Clothing – The Seat – The Order – General Hints.
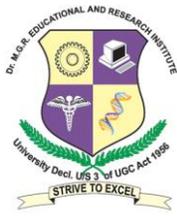
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Chapter – XXII

Yogic Exercises

Vajrasana, Sasankasana, Ustrasana, Bhjangasana, salabasana, Paschimatanasana, Dhanurasana, Matsyendrasana, Sarvangasana, Chakrasana, Suryanamaskar.

Chapter – XXIII

Breathing Exercises

Points to ponder -Prana – Importance – Steps – Precautions – Benefits of Pranayama – Types of Pranayama.

Chapter – XXIV

Exercises for the mind

How & When of Meditation – Yoga and Mental Health – Sattvic Mind – Rajasic Mind – Tamasic Mind. **Chapter –**

Chapter – XXV

Yoga on Different body functions

Yoga and other Exercises – Yoga versus pilates – Some Questions.

UNIT III : ENVIRONMENTAL POLLUTION (6 Hrs)

1.Definition – causes, effects and control measures of: (a) air pollution (b) water pollution (c) soil pollution (d) marine pollution (e) noise pollution (f) thermal pollution (g) nuclear hazards. **2. Solid waste management:** causes, effects and control measures of urban and industrial wastes. **3. Role of an individual in prevention of pollution**

4. Pollution case studies. **5. Disaster management:** floods, earthquake, cyclone and landslides.

UNIT IV : SOCIAL ISSUES AND THE ENVIRONMENT (6 Hrs)

1.From unsustainable to sustainable development. 2. urban problems related to energy. 3. **water conservation**, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns. **4. Environmental ethics**: issues and possible solutions. **5. climate change -** global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

UNIT V : HUMAN POPULATION AND THE ENVIRONMENT (6 Hrs)

1.**Population growth** - variation among nations – population explosion. 2. Family welfare programme. 3.

Environment and human health – human rights . **4. value education** – HIV / AIDS – women and child welfare

5. Role of information technology in environment and human health.

Total No of Hrs :30

TEXT BOOKS:
1. Vairamani, S and K. Sankaran(2003), *Health Science for Engineers***.** KPSV. Computers and Offset Printers
2. Vairamani, S. and Dr. K. Sankaran(2011). *Fitness and Health,*KPSV Publications, 5th Edition

REFERENCE BOOKS
3**.** Environmental studies by IFTHIKARUDEEN.A, Durga prasad.K , K.Pandian and Prabakaran.
4. Satya paul, Dr.Yogasanas & Sadhana, New Delhi, Pushpak Mahal,2003.
5. Ashwin Bharadwaj, Stress, New Delhi: Goodwill Publishing Hug.2006

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BEC 13001 **BASIC ELECTRONICS ENGINEERING** **3 0 0 3**

OBJECTIVES:

➢ To introduce the basic theoretical principles behind the working of modern electronic gadgets.

➢ To expose learners to the concepts of digital electronics

➢ To gain knowledge on electronics circuits to enable learners to assemble simple devices.

UNIT I : ELECTRON DYNAMICS **(9 Hrs)**

Motion of electron in electric, magnetic and combined electric and magnetic fields- Detection and focusing system of Oscilloscope tube - Television picture tube - LCD and Flat panel displays.

UNIT II : TRANSPORT PHENOMENON IN SEMICONDUCTOR **(9 Hrs)**

Mobility and Conductivity - Drift and Diffusion Currents - Continuity equation - Minority carrier injection and recombination in Homogeneous semiconductors – Thermistors - Peizo Resistors - Hall effect - Thermoelectric effect.

UNIT II : PASSIVE COMPONENTS & PN JUNCTION **(9 Hrs)**

Resistors- Inductors and Capacitors and their types - Construction and characteristics of PN junction diode – Zener diode - Tunnel diode - Bipolar junction transistors – Common base and common emitter circuits.

UNIT IV : ELECTRONIC DEVICES AND LINEAR ICS **(9 Hrs)**

Rectifiers : **Half wave and full wave rectifier - capacitive filter - wave forms - ripple factor - regulation characteristics.**

Special semiconductor devices: FET – SCR – LED – V I characteristics – applications.

UNIT V : DIGITAL SYSTEM **(9 Hrs)**

Number system: Binary system, Decimal to binary, Octal system, Hexadecimal system, binary –addition, subtraction, multiplication and division.

Logic gates: OR, AND, NOT, Exclusive-OR, NOR, NAND gates, Logic networks, Gate standardization, simple combinational logic circuits.

Total No of Hrs : 45

TEXT BOOKS

1. Millman and Halkias1991, *Electronic Devices and Circuits* , Tata McGraw Hill,

2. Mehta V.K1980, *Principles of Electronics*, S. Chand & Co.,

REFERENCE BOOKS

1. Electronics circuits and systems – Owen Bishop

2. Electronics and communications for scientists and Engineers- Martin Plonus

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BME 13002   **BASIC ENGINEERING GRAPHICS**   **2 0 2 3**

OBJECTIVE:

➢ To develop graphic skills for communications of concepts, ideas and design of engineering products and expose to existing national standards related to engineering drawing.

CONCEPTS AND CONVENTIONS (Not for examination)   **(3 Hrs)**

Introduction to drawing, importance and areas of applications – BIS standards – IS: 10711 – 2001 : Technical products Documentation – Size and layout of drawing sheets – IS 9606 – 2001: Technical products Documentation – Lettering – IS 10714 & SP 46 – 2003: Dimensioning of Technical Drawings – IS : 15021 – 2001 : Technical drawings – Projections Methods – drawing Instruments, Lettering Practice – Line types and dimensioning – Border lines, lines title blocks Construction of polygons – conic sections – Ellipse, Parabola, Hyperbola and cyloids.

UNIT I PROJECTION OF POINTS, LINES AND PLANE SURFACES   **(9 Hrs)**

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 in simple position only.

UNIT II PROJECTION OF SOLIDS   **(9 Hrs)**

Projection of simple solids like prism, pyramind, cylinder and cone in simple position

Sectioning of above solids in simple vertical position by cutting plane inclined to one reference plane and perpendicular to the other.

UNIT III DEVELOPMMENT OF SURFACES AND ISOMETRIC PROJECTION   **(9 Hrs)**

Development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinders, and cones.

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

UNIT IV ORTHOGRAPHICS PROJECTIONS   **(9 Hrs)**

Orthographic projection of simple machine parts – missing views

BUILDING DRAWING

Building components – front, Top and sectional view of a security shed.

UNIT V COMPUTER AIDED DRAFTING   **(6 Hrs)**

Introduction to CAD – Advantages of CAD – Practice of basic commands – Creation of simple components drawing sing CAD software.

Total No. of Hrs. : 45

Text Books
1. Bhatt, N.D. and Panchal, V.M. (2003) Engineering Drawing Charotar Publishing House
2. Gopalakrishnan, K.R. (1998) Engineering Drawing (Vol.I & II Combined) Subhas Stores, Bangalore

References
1. Natarajan, K.V (2006) A Text Book of Engineering Graphics, Dhanalakshmi Publisheres, Chennai
2. Venugopal, K and Prabhu Raja, V. (2008) Engineering Graphics, New Age International (P) Limited

Special Points applicable to University examinations on Engineering Graphics
1. The examination will be conducted as any other theory examination
2. There will be five questions, each of either or type covering all units of the syllabus
3. All questions will carry equal marks of 20 each making a total of 100
4. The answer paper shall consists of drawing sheets of A2 size only. The students will be permitted to use appropriate scale to fit solution within A2 size.

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BPH 13L01   **PHYSICS LAB**   **0 0 3 1**

OBJECTIVES:

> ➢ To attain clarity in theoretical concepts through experimentation.
>
> ➢ To help learners to make precise measurements using different instrument

LIST OF EXPRIMENTS

1. Torsional Pendulum – Determination of Moment of Inertia of the disc and Rigidity Modulus of the wire

2. Determination of Coefficient of Viscosity - Poiseuille's Method.

3. Laser Grating – Determination of Wavelength of the given source.

4. Spectrometer – Prism – Determination of refractive index of the material of the given prism.

5. Spectrometer – Grating – Determination of wavelength of various colours of the Mercury Spectrum.

6. Lee's Disc – Determination of Thermal Conductivity of a bad conductor.

7. Transistor Characteristics

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BCH 13L01   **CHEMISTRY LAB**   **0 0 3 1**

OBJECTIVES:

➢ To familiarize to students in the determination of water quality parameters

➢ To help learners measure conductivity and EMF using electrical equipments.

LIST OF EXPRIMENTS

1.   Estimation of total hardness of water.

2.   Determination of type and extent of alkalinity in water.

3.   Estimation of dissolved oxygen in water sample.

4.   Estimation of strong acid by conductometry

5.   Determination of Equivalent conductance of strong electrolyte at infinite dilution.

6.   Estimation of Fe^{3+} ion by potentiometry

7.   Determination of M.W of Polymer – viscometry

8.   Determination of D.P of Polymer – viscometry

9.   Estimation of Iron by Spectrophotometric method (Demonstration)

10.   Estimation of sodium ion by flame photometric method. (Demonstration)
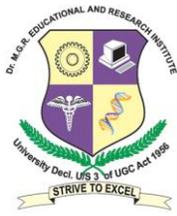
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BCS 13L01   **PROGRAMMING & MULTIMEDIA LAB**   1 0 2 2

OBJECTIVES:

- ➢ To impart basic knowledge in C programming
- ➢ To give an overview of Multimedia

C PROGRAMS:

1. Addition or Subtraction of two numbers
2. Odd or Even numbers
3. Prime number
4. Fibonacci series
5. Factorial using Recursion
6. Armstrong number
7. Ascending & Descending order
8. String is palindrome or not
9. Student mark sheet using structures
10. Swapping using pointer
11. String concatenation using Arrays
12. Implementation of Files

MULTIMEDIA LAB

1. Simple flash button
2. Flash button directing to URL
3. Shape tweening
4. Motion tweening
5. Masking in flash
6. Picture animation in flash
7. Text Morphing
8. animation along a curved path
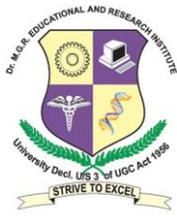
Dr.M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
UNIVERSITY
(Decl. U/S 3 of the UGC Act 1956)

B.Tech First Year curriculum and syllabus

BSEP 13L01   **WORKSHOP & PROJECT LAB**   **0 0 3 1**

PART A - WORKSHOP (Mechanical & Civil)

MECHANICAL ENGINEERING

OBJECTIVES:

➢ To familiarize the learners with plumbing tools, fittings, carpentry tools etc.

➢ To introduce simple fabrication techniques

➢ To execute a project independently and make a working model.

➢ Preparation of plumbline sketches and learn the use of pipe connection fitting.

FITTING SHOP PRACTICE:

Study of fitting tools and Equipments – Practicing, filing, chipping and cutting – making V-joints, half round joint, square cutting and dovetail joints.

SHEET METAL PRACTICE :

Study of tools and equipments – Fabrication of tray, cones and funnels.

CARPENTRY:

Introduction – Types of wood – Tools – Carpentry processes – Joints

Joints – Planning practice – Tee Halving Joint – Cross Lap Joint – Maritse and Tenon Joint – Dovetail Joint

CIVIL ENGINEERING

1. Study of Surveying and its equipments

2. Preparation of plumbing line sketches for water supply and sewage lines

3. Basic pipe connection using valves, laps, couplings, unions, reduces and elbows in house hold fittings

PART B – PROJECT LAB

Each student should submit a Working Model, on any one of the fields, at the end of the II Semester.

1. Physics/Electrical/Electronics

2. Chemistry

3. English

4. Environmental and Health Science.

5. Mechanical / Civil