B TECH (3rd SEMESTER) ELECTRICAL AND ELECTRONICS ENGINEERING

EEE-207 POWER GENERATION, OPERATION AND CONTROL

L	T	P	Cr
3	1	-	4

Internal Evaluation: 50 Marks
External Examination: 50 Marks
Duration of Examination: 03 Hours

Course Objective:

To make the students understand the basic concepts of electrical power generation using hydro, Nuclear, Thermal, Non-conventional energy sources and their economic operation. After undergoing this course the students will have the knowledge of various power plants, Their economic operation, Tariff structure, And power factor improvement etc.

UNIT-I	Load Curves, Maximum Demand, Load Factor, Diversity Factor, Capacity Factor, Utilization Factor, Types of Load, Load Forecasting techniques, Power Plant Economics: Choice of type of generation, Size of generator and number of units, Cost of Electrical Energy, Depreciation of plant, Effect of load factor on cost of Electrical Energy. Economics of Power Generation: Cost of electrical energy, Methods of determining depreciation, Straight line, Diminishing value and sinking found method. Types of Tariffs, Influence of load and power factor on tariff, Economics of power factor improvement.
UNIT-II	Hydro Electric Generation: Classification of hydro plant, Selection of site, Estimation of power available, Selection of turbine and modeling of turbine. Plant layout, Governors and Hydro plant auxiliaries. Specifications of hydro generators, Characteristics of hydro generators, General arrangement of water wheel generators: large horizontal shaft generators, Vertical and reversible generators, Low speed generators, Umbrella type, Brakes and jacks, losses, Insulation and temperature limits, Testing of generators, Generator cooling and ventilation, Economics of the hydro power plant.
UNIT-III	Nuclear Power Generation: Principle of energy production by nuclear fission, Schematic of nuclear power plant, Nuclear fuels and fertile materials, Nuclear reaction construction. Chain reaction, Moderator, Coolants, Control of fission, Reactor operation, Different types of reactors, Problem of nuclear power plants. Diesel Power Plants: Diesel plant Equipment, Diesel plant Layout and its working, Application of diesel plants, Combined working of Plants, Advantages of combined operation, Plant requirements for Base load and Peak load Operation. Combined working of Run-off River Plant and steam plant.
UNIT-IV	Power Station Equipment and Control: Excitation Systems- Purpose and requirements of excitation systems, Static excitation systems, Brushless excitation system. Voltage Regulators- Functions and characteristics of automatic voltage regulators, Solid state regulator. Speed Governing Systems- Purpose of speed governing system, Hydraulic type speed governing system for steam turbines and hydro-turbines. Automatic Generation Control- Types of interconnection, Advantages of interconnection, Real and Reactive power control, Single area automatic generation control, Automatic Generation control for two area system, Types of automatic generation control for interconnected power systems.

Recommended Books:

- Skrotzki B G A & Vopat W A, Power Station Engineering & Economy, McGraw Hill
- Gupta B R, Generation of Electrical Energy, S Chand & Co
- Deshpande M V, Elements of Electrical Power Station Design, Ah Wheeler & Co Ltd
- El-Wakil M M, Power Plant Technology, Mcgraw Hill
- Murty P S R, Power System Operation and Control, Tata McGraw Hill, New Delhi
- Gupta B R, Generation of Electrical Energy, Eurasia Publishing House (Pvt)Ltd, New Delhi
- Gupta P V et al, A Course in Electrical Power, Dhanpat Rai and Sons, Delhi

B.Com (H) Syllabus – 1st Year
B.CH -06 Banking & Finance

Course Objective: To provide a basic foundation of the fundamentals principles and practices of banking & insurances and other financial service and application in practice.

Unit 1	**Introduction to Banking:** Nature and Scope of Banking– An overview of Indian financial system and its constitution, a broad understanding of terms of banking and their use in daily business, justification or inclusion of banking in the package of financial service.
Unit 2	**Development of Banking System:** Banking – Origin and development of Indian banking, present structure: central banking (RBI), commercial banking (nationalized and Private), cooperative banking: development banking(financial institutions like NABARD, IDBI, SIDBI, EXIM IFCI, ICICI, SHCL, DFHI, NHB, SFC. Investment banking and international banking, roles and functions of different types of banking ,
Unit 3	**Regulatory System in Banking Industry:** Regulatory framework governing the functioning of different types of banks, laws and enactments affecting day to day banking operations – collection & payments, indemnities, letter of credit, bill discounting, bill financing and securities, Indian contract act, sales of goods act, negotiable instrument act, evidence act, Indian Partnership act, Indian company law.
Unit 4	Asset Related Credits such as leasing, Hire-Purchase, Stock Financing and Venture Financing: Risk-Based such as Letters of Credit, Guarantees and Bills Receivables, Mortgages & Housing Finance, Financial Engineering and Advisory Services-Concepts-Procedures/Formalities and Regulatory and legal framework governing the functioning of money markets, Reform of the financial system, Financial services-Challenges Ahead
Unit 5	**Operational Aspects of Financial Services in Banking:** Types of Financial Services- Classified on the Basis of Market instrument used, Capital Market Services, Issue Management, Portfolio Management, Mutual Funds, Investing & Broking, Dematerialization of Securities, Money market Securities Such as Commercial paper, Certificate of deposit, T- Bills, Transactions in response & Reverse Response, Commercial Bills etc, Management of Short term Funds such as Money market Mutual Funds, managing Receivables i.e. (factoring or Bill Discounting)

Recommended Text

- M.N Mishra, Insurance principles and practices(S. Chand)
- M.Y Khan, Indian Financial System (Tata Mcgraw Hill)
- M.Y Khan, Financial Services in India (Tata Mc graw Hill)

B TECH (7th/8th SEMESTER) ELECTRICAL AND ELECTRONICS ENGINEERING

OE-431/432 QUALITY CONTROL AND RELIABILITY

L	T	P	Cr
3	-	-	3

Internal Evaluation: 25 Marks
External Examination: 50 Marks
Duration of Examination: 03 Hours

Course Objective:

UNIT-I	Concept of quality, Need, Factor influencing quality, Types of quality, Quality control, Cost of quality control, Types of costs, Quality assurance, Inspection and quality control, Quality characteristics, Quality circles, Quality and productivity, Quality and reliability, ISO definition of quality, Various phases till TQM and its meaning to industries, Customers and employees, Contribution of various quality gurus, Quality management, Tools for continuous quality improvement.
UNIT-II	Review of fundamental statistical concept, Frequency distribution, Central tendency, Measures of dispersion, Probability distributions, Statistical quality control, causes of variation, Theory of control charts, Type I and Type II errors, Preliminary decisions, Control charts for mean and range, Control charts for mean and standard deviation, Control chart for attributes, Chart for proportion nonconforming (p-chart) chart for number of nonconforming items, chart for number of nonconformities, Their advantages and disadvantages, Applications.
UNIT-III	Acceptance Sampling, Purpose, Acceptance by Attributes, Single sampling plans. O.C. curve selection of sampling plans, Acceptance number, Type A and Type B errors, O.C. curves, Double sampling plan and its analysis, Multiple and sequential sampling, A.O.Q.L., Acceptance sampling plans under risk, Design of various sampling plans, Dodge-Roming type system for acceptance sampling by attributes (use of various tables), Determination of process average, Acceptance sampling by variables.
UNIT-IV	Reliability, Factor effecting Reliability, Failure and its types, Failure curve, Majors of reliability, MTBF, MTTF, Relationship b/w reliability failure rate and MTBF and its characteristics, System reliability (components in series and parallel) System reliability with stand by components, Redundancy, Operating characteristics curve, Reliability and life testing plans, Types of test, Maintainability, Availability.

Recommended Books:

- Gupta C, Statistical Quality control
- Mitra Amitava, Fundamental of Quality Control and Improvement
- Wadsworth Harrism M, Modern Methods for Quality Control and Improvement
- Grant E L, Statistical Quality Control
- Ams Tadter B L, Reliability Mathematics

BACHELOR OF PHYSIOTHERAPY (BPT)
FIRST YEAR
ELECTROTHERAPY-I
Course Code: BPT –103

Course Objectives:

1. To list indications and contraindications of various Modalities.
2. To understand different techniques of applications, their justification and effects.
3. Demonstration of individual techniques of applications of various modalities.
4. The student will be able to understand the fundamentals of electrotherapy
5. The student will be able to do electro-diagnosis
6. The student will be able to select various electro-therapeutic tools and techniques with appropriate skills management of patients for promotion, prevention and cure of various conditions.
7. The student will be able to identify indications & contraindications of various modalities and learn specificity.

Course Contents: All sections carry equal weightage

Section – A

UNIT 1. LOW FREQUENCY CURRENTS:

Nerve Muscle Physiology: brief outline
Faradic current:
Indications, contraindications, Techniques, parameters, Group musclestimulation.
Faradic footbath, Faradism under pressure and muscle re-education.
Dosimetry

Galvanic current:
Indications, contraindications, precautions and therapeutic effects of stimulation.
Techniques, parameters, Dosimetry

Electro-Diagnosis:
S. D. Curve, Reaction of degeneration, Chronaxie & Rheobase
Outline of EMG & Nerve conduction velocity

Iontophoresis:
Definition and principles & factors

Indications, effects, techniques, contraindications, precautions and Potentialharmful effects.

TENS therapy:
Principle of therapy, Parameters and therapeutic uses.
Theories of pain and pain control.
Indications and contra-indications, Dosimetry

Section – B

UNIT 2. THERMAL THERAPY MODALITIES:

Heating Modalities:
Therapeutic effects and uses, Techniques and applications
Indications, contraindications, precautions and Potential harmful effects of various heat modalities: Paraffin bath therapy, Hydro collator packs, Whirlpool and moist heat Heating pads, Hot air chambers.

Cold-therapy:
Indications, contraindications and therapeutic effects.
Technique, precautions and Potential harmful effects of treatment, Dosimetry

UNIT 3. Traction instruments:
Rationale, technique, indications, contraindications, precautions of electric tractionequipments

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

B TECH (5th SEMESTER) MECHANICAL ENGINEERING

PEC MEL 304 Mechatronic Systems

Course Objective:

- To understand the structure of microprocessors and their applications in mechanical devices
- To understand the principle of automatic control and real time motion control systems, with the help of electrical drives and actuators
- To understand the use of micro-sensors and their applications in various fields

UNIT-I

Introduction: Definition of Mechanical Systems, Philosophy and approach; Systems and Design: Mechatronic approach, Integrated Product Design, Modeling, Analysis and Simulation, Man-Machine Interface

UNIT-II

Sensors and transducers: classification, Development in Transducer technology, Optoelectronics-Shaft encoders, CD Sensors, Vision System, etc.;

UNIT-III

Drives and Actuators: Hydraulic and Pneumatic drives, Electrical Actuators such as servo motor and Stepper motor, Drive circuits, open and closed loop control; Embedded Systems: Hardware Structure, Software Design and Communication, Programmable Logic Devices, Automatic Control and Real Time Control Systems;

UNIT-IV

Smart materials: Shape Memory Alloy, Piezoelectric and Magnetostrictive Actuators: Materials, Static and dynamic characteristics, illustrative examples for positioning, vibration isolation, etc.;

UNIT-V

Micromechatronic systems: Microsensors, Microactuators; Micro-fabrication techniques LIGA Process: Lithography, etching, Micro-joining etc. Application examples; Case studies Examples of Mechatronic Systems from Robotics Manufacturing, Machine Diagnostics, Road vehicles and Medical Technology

Recommended Books:

1). Mechatronics System Design, Devdas Shetty & Richard A. Kolk, PWS Publishing Company (Thomson Learning Inc.)
2) . Mechatronics: A Multidisciplinary Approach, William Bolton, Pearson Education
3) . A Textbook of Mechatronics ,R.K.Rajput, S. Chand & Company Private Limited
4) Mechatronics: Electronic Control Systems in Mechanical and Electrical Engineering, William Bolton, Prentice Hall

M TECH: ENVIRONMENTAL SCIENCE AND ENGINEERING

ESE – 613 WATER TREATMENT PROCESSES

InternalAssessment/Evaluation: 40 Marks
External Examination: 60 Marks
Duration of Examination: 03 Hours

Water Quality: wholesomeness of water, definitions, water-quality parameters and their examination and significance, water-quality requirements and standards.

Water Purification Processes in Natural Systems: physical, chemical and bio-chemical processes. Response of streams to bio-degradable organic waste, application of natural processes in engineered systems.

Water Treatment Processes: Theory, Design and Application – aeration, solids separation, settling operations, coagulation and flocculation, adsorption, filtration, chlorination and other disinfection processes, softening, taste and odour removal, corrosion phenomenon, and other water treatment processes like removal of fluoride, arsenic, iron and manganese.

Note: *The examiner is required to set EIGHT questions in all carrying equal marks covering the entire syllabus. The candidate is required to attempt FIVE questions.*

Recommended Books:

- "Water Quality and Treatment" A Handbook of Public Water Supply by The American Water Works Association (AWWA), McGraw Hill Inc. New York.
- "Environmental Engineering" by H.S. Peavy, D.R. Rowe and G Tchobanoglous, McGraw-Hill Book Co. NY.
- "Physicochemical Processes for Water Quality Control" by W.J. Weber, Wiley Interscience, NY.
- "Environmental Engineering" by A.P. Sincero and G.A. Sincero, PHI, N. Delhi.
- "Water Quality" by American Water Works Association (AWWA).
- "Water Treatment" by American Water Works Association (AWWA).
- "Environmental Engineering (Vol. I)" by S.K. Garg, Khanna Publishers, N. Delhi.
- "Manual on Water Supply and Treatment" by CPHEEO, GOI, N. Delhi.

CORE PAPER XI: CC11 (B5MB-CT11): INDUSTRIAL MICROBIOLOGY

Unit 1 Introduction to industrial microbiology
Brief history and developments in industrial microbiology

Unit 2 Isolation of industrially important microbial strains and fermentation media
Sources of industrially important microbes and methods for their isolation, preservation and maintenance of industrial strains, strain improvement, Crude and synthetic media; molasses, corn- steep liquor, sulphite waste liquor, whey, yeast extract and protein hydrolysates

Unit 3 Types of fermentation processes, bio-reactors and measurement of fermentation parameters
Types of fermentation processes - Solid-state and liquid-state (stationary and submerged) fermentations; batch, fed-batch (eg. baker's yeast) and continuous fermentations, Components of a typical bio-reactor, Types of bioreactors-Laboratory, pilot- scale and production fermenters, constantly stirred tank and air-lift fermenters, Measurement and control of fermentation parameters - pH, temperature, dissolved oxygen, foaming and aeration

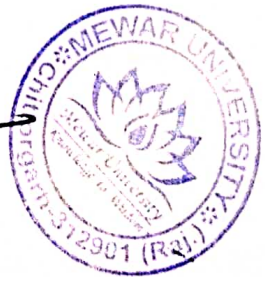
Unit 4 Down-stream processing
Cell disruption, filtration, centrifugation, solvent extraction, precipitation, lyophilization and spray drying

Unit 5 Microbial production of industrial products
micro-organisms involved, media, fermentation conditions, downstream processing and uses, Citric acid, ethanol, penicillin, glutamic acid, Vitamin B12 Enzymes (amylase, protease, lipase) Wine, beer

Enzyme immobilization
Methods of immobilization, advantages and applications of immobilization, large scale *applications of immobilized enzymes* (glucose isomerase and penicillin acylase)

PRACTICAL

1. Study different parts of fermenter
2. Microbial fermentations for the production and estimation (qualitative & quantitative) of :
   (a) Enzymes: Amylase and Protease
   (b) Aminoacid: Glutamic acid
   (c) Organic acid: Citric acid
   (d) Alcohol: Ethanol
3. Avisit to any educational institute/industry to see an industrial fermenter, and other downstream processing operations.



SUGGESTEDREADINGS

1. PatelA.H.(1996).IndustrialMicrobiology.1stedition,MacmillanIndiaLimited
2. OkaforN.(2007).ModernIndustrialMicrobiologyandBiotechnology.1stedition.BiosScientificPublishersLimited.USA
3. WaitesM.J.,MorganN.L.,RockeyJ.S.andHigtonG.(2001).IndustrialMicrobiology:AnIntroduction.1st edition.Wiley–Blackwell
4. GlazeA.N.andNikaidoH.(1995).MicrobialBiotechnology:FundamentalsofAppliedMicrobiology.1stedition.W.H.FreemanandCompany
5. CasidaLE.(1991).IndustrialMicrobiology.1stedition.WileyEasternLimited.
6. CruegerWandCruegerA.(2000).Biotechnology:AtextbookofIndustrialMicrobiology.2ndedition.PanimaPublishingCo.NewDelhi.
7. StanburyPF,WhitakerAandHallSJ.(2006).PrinciplesofFermentationTechnology.2ndedition,ElsevierScienceLtd.

Artificial Intelligence [BCA-304 B]

SEMESTER – III

Total Credit: 4 **Total Marks: 100**

Teaching Scheme (per week in hours)			Evaluation Scheme						
					Practical Examination		Teacher Assessment		
Lecture	Tutorial	Lab	Pre-final Examination	Final Examination	Internal	External	P	A	C/M
3	1	0	35	50	0	0	6	5	4

Syllabus

Unit No.	Unit Name	Course Contents	Lectures per unit
1	Introduction to AI	Definition of artificial intelligence ,Understand the different faculties involved with intelligent behavior Examine the different ways of approaching AI, expert systems, brief history of AI,types of problems that can be currently solved by computers and those that are as yet beyond its ability. Difference between an Agent, An intelligent agent and a rational agent. Different agent architectures- Stimulus response agents, State based agents ,Deliberative / goal-directed agents, Utility based agents	7
2	Agents	Introduction to Agent ,Agent Environment, Agent architectures, Problem Solving using Search-(Single agent search),Introduction to State Space Search: State space search, Explicit vs Implicit state space, Uninformed Search, Informed Search Strategies, Expert systems architecture introduction to few expert systems: mycin, dendral.	7
3	Knowledge Representation and Logic	Propositional Logic Knowledge Representation and Reasoning,Propositional Logic, Propositional Logic Inference, Propositional Logic inference rules Rules of Inference,Using Inference Rules to Prove a Query/Goal/Theorem, Soundness and Completeness	8
4	Machine Learning	Introduction to Learning, Taxonomy of Learning Systems, types of machine learning, inductive learning problem,Learning From observations,ConceptLearning,Rule Induction and Decision Tree,DecisionTrees,SplittingFunctions,Decision Tree Pruning.	8
5	Artificial Neural Network	Introduction to Artificial Neural Network, Biological Neural Networks and Artificial Neural Networks, Perceptron, Perceptron Learning,The Perceptron Rule,The DeltaRule,Multi-Layer Perceptions, BackPropagation,ForwardPropagation,Backward Propagation, Multilayer perceptron. Introduction to Adaptive resonance theory.	10
		Total	**40**

Text/Reference Books:

- Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", Pearson Education
- Elaine Rich and Kevin Knight, "Artificial Intelligence", McGraw-Hill
- E Charniak and D McDermott, "Introduction to Artificial Intelligence", Pearson Education
- Dan W. Patterson, "Artificial Intelligence and Expert Systems", Prentice Hall of India,

Semester – IV
Theory Courses

EC-401 THEORY OF SPORTS AND GAMES (ELECTIVE)

UNIT-IINTRODUCTION

General Introduction of speciliazed games and sports–

- Athletics,
- Badminton,
- Basketball,
- Cricket,
- Football,
- Gymnastic,
- Hockey,
- Handball,
- Kabaddi,
- Kho-Kho,
- Tennis,
- Volleyball and
- Yoga.

Each game or sports to be dealt under the following heads

- History and development of the Game and Sports
- Ground preparation, dimensions and marking
- Standard equipment and their specifications
- Ethics of sports and sportsmanship

UNIT-II Scientific Principles of coaching: (particular sports and game specific)

- Motion – Types of motion and Displacement, Speed, Velocity, Acceleration, Distance and Newton's Law of motions.
- Force – Friction, Centripetal and Centrifugal force, Principles of force.
- Equilibrium and its types
- Lever and its types
- Sports Training – Aims, Principles and characteristics.
- Training load – Components, Principles of load, Over Load (causes and symptoms).

UNIT-III Physical fitness components: (particular sports and game specific)

- Speed and its types
- Strength and its types
- Endurance and its types
- Flexibility and its types
- Coordinative ability and its types

- Training methods: - Development of components of physical fitness and motor fitness through following training methods (continuous method, interval method, circuit method, fartlek /speed play and weight training)

UNIT-IV Conditioning exercises and warming up.

- Concept of Conditioning and warming up.
- Role of weight training in games and sports.
- Teaching of fundamental skill & their mastery (technique, tactic and different phases of skill acquisition).
- Recreational and Lead up games
- Strategy – Offence and defense, Principles of offence and defense.

References:

Bunn, J. W. (1968). *The art of officiating sports.* Englewood cliffs N.J. Prentice Hall.

Bunn, J. W. (1972). *Scientific principles of coaching.* Englewood cliffs N. J. Prentice Hall.

Dyson, G. H. (1963). *The mechanics of athletics*. London: University of London Press Ltd.

Lawther, J.D. (1965). *Psychology of coaching.* New York: Pre. Hall.

Singer, R. N. (1972). *Coaching, athletic & psychology*.New York: M.C. Graw Hill.

INDIAN ECONOMY

L	T	P	C
3	1	0	3

(40 Hours)

Objectives

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in India in the post-Independence period, with particular emphasis on paradigm shifts and turning points.

Expected Outcome

Student will be able to understand the basics of the Indian economy – trends in national income, agriculture, industry, & external sector.

Unit-I **(08 Hours)**

Basic feature of Indian economy and review of five year plans

National income- trends and composition, Sources of capital formation and savings. Sectoral growth. Demographic trends in India and its effect on economic development. Occupational structure of the labour force. Review of FYPs in India.

Unit-II **(10 Hours)**

Agriculture: Problems of agricultural development- trends in products and productivity of food and non-food crops. Land reforms, agricultural finance and marketing. Green revolution, its feature and economic implications. Public distribution of food-grains. Co-operation- its role in Indian economy, its achievements and weaknesses.

Unit-III **(12 Hours)**

Industry: Industrial development during the planning period. Industrial policy of 1948, 1956,1977 and 1991. Industrial licensing policy – MRTP Act, FERA and FEMA. Growth and problems of small-scale industries. Role of Public sector enterprises in India's industrialization. Impact of economic reforms on Indian industrial sector after 1991.

Unit-IV **(10 Hours)**

External Sector: Role of foreign trade. Trends in exports and imports. Composition and direction of India's foreign trade. Balance of payments crises and new economic reforms – export promotion measures and the new trade policies. Foreign Capital – FDI, Multinational corporations (MNCs).

1. Agarwal, A. N. Indian Economy – Problems of Development Planning, Wiley Eastern Ltd., Calcutta (latest edition).
2. Ahluwalia, I.J. and I.M.D. Little (eds.) (1999). India's Economic Reforms and Development: Essays in honour of Manmohan Singh, Oxford University Press, New Delhi.

TEXT BOOKS:

1. Agrawal, A.N. Indian Economy- Problems of Developmental Planning, Wiley Eastern Ltd, Calcutta(latest edition).
2. Ahluwalia, I.J and I.M.D. Little(eds)(1999). India's Economic Reforms and Development: Essays in honour of Manmohan Singh, Oxford University Press, New Delhi.

REFERENCE BOOKS:

1. Alam, K. (ed.) (1993). Agricultural Development in North East India: Constraints and Prospects, Deep & Deep Publications, New Delhi.
2. Choudhuri, Pramit. (1975). Aspects of Indian Economic Development, Lord George Allen &
Unwin Ltd., London.
3. Dutt, R.C. (1950). The Economic History of India Under Early British Rule, Low Price Publications, Delhi.
4. Dutt, Ruddar and K.P.M. Sundaram (2001). Indian Economy, S. Chand & Co. Ltd., New Delhi
5. Economic and Political Weekly, Bombay (Relevant Issues).
6. Gadgil, D.R. (1971). The Industrial Evolution in India in Recent Times, 1860-1939, Oxford
University Press, Bombay.
7. Government of India, Economic Survey (Annual). Economic Division, Ministry of Finance,
New Delhi.
8. Jalan, B. (1992). The Indian Economy, Problems and Prospects, Viking, New Delhi.
9.Misra, S.K. and V.K. Puri (2001). Indian Economy – Its Development Experience, Himalaya Publishing House, Mumbai.
10. North-Eastern Council (2000). Basic Statistics of North-Eastern Region.
11. Wadhwa, C.D. (ed.), Some Problems of Indian Economic Policy, Tata McGraw Hill, New
Delhi (latest edition)

B TECH (3rd SEMESTER) CHEMICAL ENGINEERING

CHE-205 CHEMICAL TECHNOLOGY-I

L	T	P	Cr
4	-	-	4

Internal Evaluation: 50 Marks
External Examination: 50 Marks
Duration of Examination: 03 Hours

Course Objective:

Chemical process industries has been playing important role in the development of a country in order to meet the basic needs of mankind. There has been continuous upgradation in technologies for improving the overall economy of the process.

The aim of the course is to study process technologies, Availability of raw materials, Production trends, Material and energy balances, Flow sheets, Engineering problems pertaining to materials of construction, Waste regeneration/recycling, Environmental and energy conservation measures, For various inorganic chemical industries.

UNIT-I	Introduction to Chemical Engineering, Unit operations and unit processes, Functions of a chemical engineer in chemical and bio-chemical process industries. Industrial and Fuel Gases, Oxygen, Nitrogen, Hydrogen, Carbon dioxide, Natural gas, LPG, Producer gas, Water gas, Carbureted water gas, Coke oven gas, Synthesis gas.
UNIT-II	Nitrogen Industries, Ammonia, Nitric acid, Ammonium sulphate, Ammonium nitrate, Urea, Calcium ammonium nitrate. Phosphorus Industries, Phosphorus, Phosphoric acid, Phosphatic fertilizers. Mixed Fertilizer, N P K fertilizers, Diammonium hydrogen phosphate.
UNIT-III	Chlor-Alkali Industries, Brine electrolysis, Manufacture of caustic soda and chlorine in mercury cells, Diaphragm cells, Membrane cells, Hydrochloric acid. Soda ash. Sulphur Industries, Sulphur dioxide, Sulphuric acid, And oleum.
UNIT-IV	Ceramic Industries, Portland Cement, Other Cement, Lime, Gypsum, Glass Industries, Methods of manufacture of glass and special glasses. Explosives, Propellants, And Toxic Chemical Agents, Types and characteristics of explosives, Industrial explosives, Propellants, Rockets and Missiles, Propellants for rockets. Metallurgical Industries, Iron and steel, Cryogenics, Applications in chemical industry.

Recommended Books:

- Rao M G and Sittig M, Dryden's outlines of Chemical Technology-For the 21st century, Affiliated East West Press
- Austin G T, Shreve's Chemical Process Industries, McGraw-Hill
- Faith W L, Keyes D B and Clark R L, Industrial Chemicals, John Wiley

MEWAR UNIVERSITY Chittorgarh-312901 (Raj.)

ELEMENTS OF MINING

UNIT I	Mineral resources of Rajasthan, India and World; Mining of important economic minerals in India; Various terms used in mining; Introduction and comparison of underground and surface mining. Introduction to unit operations.
UNIT II	Prospecting and Exploration : Reconnaissance; principles and methods of prospecting - pit, shaft, trench and boreholes; Methods of Exploration, Selection of sites for boreholes; Surface layout of boring; Details of equipment, Borehole logging; Maintenance of records; Deflection of boreholes; Difficulties in boring; Fishing tools and their uses; Methods of exploratory drilling for oil; Interpretation of borehole data.
UNIT III	Supports and Reinforcement : Examination of roof; support in mines: Timber, masonry, concrete and steel supports; Storage, preservation and fire proofing of timber; Strata bolting; Roof stitching; Recovery of falls; roof bolting, cable bolting, capsule bolting.
UNIT-IV	Explosives: Classification and comparative properties of explosive; Blasting devices; General application anduses; Blasting theory; Safety considerations. Blasting system: Electric and non -electric methods; Delay blasting techniques; Priming; Charge distribution; Mechanisms of rock blasting; Blasting with cut and solid blasting, Introduction to SMS, PMS, Emulsion andHeavy ANFO.

Practical

1. Mapping of different mineral resources of (i) Rajasthan (ii) India and (iii) world.
2. Illustration of Mining Terminology.
3. Bore-hole logging and interpretation of bore hole data and numerical problems related to it.
4. Working of the Sylvester prop withdrawal system.
5. Design and use of the friction props.
6. Design and use of the hydraulic props
7. Various types of roof bolts, roof stitching and different wooden supports & their application in mines.
8. Selection of various types of blasting accessories used in mines and designing of explosive magazines
9. PMS Plants with various capacities for surface mines.
9. SMS Plants with various capacities for surface mines
10. Charging problem
11. Study of portable magazine
12. Study of exploder

एम. ए. (ज्योतिष शास्त्र) पाठ्यक्रम (M.A. Astrology Syllabus Scheme) प्रथम वर्ष, प्रथम सत्र (1st Year, 1st Semester)			
Paper – I			Paper Code
Subject	Mathematical Astrology (गणित ज्योतिष)		AST-MA-101
ईकाई	Topics	Credits = 6	Marks = 60 + 40 = 100
ईकाई – १	ज्योतिषीय गणित के माप (घटी-पल-विपल, घण्टा-मिनट-सैकेण्ड, राशि-अंश-कला-विकला) परिचय, पंचांग परिचय, तिथि साधन, वार साधन, नक्षत्र साधन, योग साधन एवं करण साधन, भारतीय पंचांगों में तिथि-वार-नक्षत्र-योग-करण को जानने की विधि। अभिजित् मुहूर्त्त एवं अभिजित् नक्षत्र का परिचय एवं गणना विधि।		
ईकाई – २	काल परिचय, स्थूल एवं सूक्ष्म काल ज्ञान, काल मानों का परिचय (ब्रह्म-दिव्य-पैत्र्य-प्राजापत्य-गौरव-सौर-सावन-नाक्षत्र-चान्द्र), व्यावहारिक काल मानों का परिचय। अक्षांश, रेखांश, देशान्तर, अयनांश परिचय, प्रचलित अयनांशों की गणना विधि, निरयण एवं सायन में अन्तर। सूर्योदय साधन, स्थानीय समय और मानक समय की गणना		
ईकाई – ३	इष्टकाल साधन, ग्रहस्पष्टीकरण, भयात- भभोग साधन लग्न साधन, दशम लग्न साधन, ससन्धि द्वादश भाव साधन एवं चलित कुण्डली निर्माण कुण्डली बनाने की प्रक्रिया		
ईकाई – ४	दशवर्ग साधन (राशि (गृह)-होरा-द्रेष्काण-चतुर्थांश-सप्तमांश-नवमांश-दशमांश-द्वादशांश-त्रिशांश-षष्ठ्यंश		
ईकाई – ५	उपरोक्त विषयों का प्रायोगिक विश्लेषण		
सन्दर्भ ग्रन्थ	1. भारतीय ज्योतिष – नेमिचन्द्र शास्त्री – भारतीय ज्ञानपीठ, दिल्ली 2. भारतीय कुण्डली विज्ञान – मीठालाल हिम्मतराम ओझा – दर्शन ओझा देवर्षि प्रकाशन, वाराणसी 3. ज्योतिषीय खगोल एवं गणित सिद्धांत, डॉ. सुशील अग्रवाल एवं डॉ. मनोज कुमार, सागर पब्लिकेशन्स, दिल्ली		

Suggested Readings

1. C.P. Chugh, High Technology in Drilling and Exploration.
Pub: Oxford & IBH Publishing Co. Pvt.Ltd. New Delhi.
2. C.P. Chugh, Diamond Drilling. Pub: Oxford & IBH Publisher.
3. Howard, L.Hartman, Introductory Mining Engineering, Pub: John Willey & Sons
4. Dr.Sushil Bhandari, Engineering Rock Blasting Operations. Pub: A.A.Balkema Publisher Old post Road, Brook field, TO5036, USA.
5. R.D. Singh, Principles & Practices of Modern Coal Mining Pub:-New Age International Pvt.Ltd. New Delhi
6. Dr. Calvin Konya; "Rock Blasting and Overbreak Control" Precision Blasting Services, Montville, Ohio

एम. ए. वास्तु शास्त्र पाठ्यक्रम M.A. Vastu Shastra Syllabus Scheme प्रथम वर्ष, प्रथम सत्र (1st Year, 1st Semester)			
Paper – IV			Paper Code
Subject	Commercial Vastu - 1 (व्यावसायिक वास्तु – 1)		VST-MA-104
ईकाई	Topics	Credits = 5	Marks = 60 + 40 = 100
ईकाई - 1	वास्तु के भेद आवासीय वास्तु व्यावसायिक वास्तु धार्मिक वास्तु		
ईकाई –2	व्यावसारिक वास्तु परिचय व्यावसायिक वास्तु में महत्त्वपूर्ण तथ्य प्राचीन काल एवं वर्तमान सन्दर्भ में भवन निर्माण व्यावसायिक भूमि एवं भूखण्ड के गुण-दोष		
ईकाई –3	दुकान और दुकान का द्वार, दुकान में मालिक की स्थिति, सेल्समेन एवं ग्राहक के बैठने की स्थिति, शोकेश एवं कैशबाक्स का स्थान, शोरुम, शोरुम का इण्टिरियर		
ईकाई –4	कार्यालय, कार्यालय का द्वार, प्रतीक्षा स्थान, स्वागत कक्ष, बैठने की व्यवस्था, कार्यालय में मालिक या सर्वोच्च अधिकारी का स्थान एवं उसके बैठने की व्यवस्था, कार्यालय में अन्य कर्मचारियों के बैठने की व्यवस्था आदि		
ईकाई - 5	होटल, रिसार्ट, होटल के कमरे, रेस्टोरेंट, बार, रिक्रियेशन रुम, अन्दर की दुकान, शोरुम आदि गेस्ट हाउस एवं होस्टल, रहने के कमरे, भोजन कक्ष, चिकित्सा कक्ष, मनोरंजन कक्ष, तरणताल, आदि		
सन्दर्भ ग्रन्थ	• व्यावसायिक वास्तु शास्त्र – प्रो. शुकदेव चतुर्वेदी • व्यावसायिक वास्तु संहिता – डॉ. मनोज कुमार – अल्फा पब्लिकेसन्स, दिल्ली		

एम. ए. (ज्योतिष शास्त्र) पाठ्यक्रम (M.A. Astrology Syllabus Scheme) प्रथम वर्ष, द्वितीय सत्र (1st Year, 2nd Semester)			
Paper – III			Paper Code
Subject	Financial Astrology (अर्घ ज्योतिष)		AST-MA-203
ईकाई	Topics	Credits = 6	Marks = 60 + 40 = 100
ईकाई – 1	ज्योतिष की दृष्टि से फायनांस विचार एवं कारकिरदी विचार धातु आदि के स्वामी, ग्रहों का बलाबल तथा फल, सर्वतोभद्रचक्र निर्माण एवं फलादेश विधि, वेध देखने की रीति, नक्षत्र वेध, नक्षत्रों पर ग्रहों के वेध से तेजी-मंदी का विचार,		
ईकाई –2	राशियों में ग्रहों का फल, नक्षत्रों में ग्रहों का फल, वक्री-मार्गी ग्रहों का फल, ग्रह उदयास्त फल आकस्मिक धन प्राप्ति के योग, प्रचुर धन संपत्ति के योग, दारिद्र योग, आर्थिक नुकसान के योग आजीविका के मुख्य प्रकार और पसंदगी – ट्रेडर, मेन्यूफ्रेक्चरर, सर्विस प्रोवाइडर, जॉब		
ईकाई –3	शेयर बाजार परिचय शेयर बाजार से फायदे का कुण्डली में निर्देश तेजी परिचय तेजी कारक ग्रह तेजी कारक राशियां		
ईकाई –4	मंदी परिचय मंदी कारक ग्रह मंदी कारक राशि शेयर बाजार के संदर्भ में ग्रह युति विचार		
ईकाई – 5	उपरोक्त विषयों का प्रायोगिक विश्लेषण		
सन्दर्भ ग्रन्थ	अर्घ-मार्तण्ड – प. मुकुन्दवल्लभमिश्र ज्योतिषाचार्य, मोतीलाल बनारसीदास, वाराणसी भद्रबाहु संहिता, बृहत्संहिता, पूर्व कालामृत, उत्तर कालामृत, बृहद पराशर होरा शास्त्र		

ELECTIVE III
MILITARY LAWS

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Objectives: **(48 Hours)**

- The primary purpose of the Military's system is to get acquainted with the defence rules of the country
- The aim of this course to help students understand the need for the difference in civilian and military law
- Help them in a career in army

Expected outcome:

- Understand the Military laws, rules & regulations
- Modes of providing sanction

Unit I **(12 Hours)**

- Introduction, Distinguish feature of the Army Act, Self Contained Code,
- Subjection & Definition, Army Act, Rules & Regulation,
- Induction & Appointment, Commission, Appointments, Enrolment, Attestation
- Conditions of Service, Service Privileges

Unit II **(12 Hours)**

- Military Offences (Sec. 34 to 36, 46 to 52, 54 to 57, 63 to 64)
- Civil Offences (Sec. 69 & 70, Cr.P.C. Sec.475)
- Arrest (Sec. 101 to 105), Types of Arrest, Regulation of the Army Paras 378, 391-397),
- Identification Parade.

Unit III **(12 Hours)**

- Investigation & Pre-trial procedure, Rights of an accused to prepare, Defence,
- Court Martial
- Summary Trial & Summary Court Martial (Army Act, Sec.80, 83-88 Army Rule 26, Regulation for the Army Paras 441 to 444)
- Confirmation & Revision, Execution of Sentences, Pardon, Remission & Suspension

Unit IV **(12 Hours)**

- Administrative Action
- Law of War, Writ Jurisdiction

TEXT BOOKS:

T1 Army Act, handbook of Army Act, 1950 with Army rules, 1954, Law Publishers (India) Pvt. Ltd

T2 Army& Air Force (Disposal of Private Property) Act, 1950, Law Publishers (India) Pvt. Ltd

T3 Army and Air Force Rules1953, Law Publishers (India) Pvt. Ltd

T4 Herbert L Packer, the Limits of Criminal sanctions, Stanford University Press

REFERENCE BOOKS:

R1 Wing Commander (Retd.) Dr. U.C.Jha, Handbook of Military law, Reference manual, Vij Books Pvt. Ltd, 2010.

R2 Kataria and Saxena , Law relating to Arms and explosive Orient Publishing Co.

R3 Wing Commander (Retd.) Dr. U.C.Jha, Armed Forces Tribunal, Manas Publica