Faculty of Engineering & Technology
P.K.University
Shivpuri (MP)

Department of Chemical Engineering

Evaluation Scheme & Syllabus for

B.Tech. Fourth Year

(VII & VIII SEM)

(Effective from session 2025-26)

EVALUATION SCHEME
B.TECH. CHEMICAL ENGINEERING
4th Year (7th Semester)

STUDY AND EVALUATION SCHEME FOR B.TECH CHEMICAL ENGG

YEAR 4th/SEMESTER-7th

SUBJECT CODE	SUBJECTS NAME	STUDY SCHEME Periods/Week			Credits	MARKSINEVALUATIONSCHEME						Total Marks of Internal & External
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT			
		L	T	P		Th	Pr	Tot	Th	Pr	Tot	
UENTRCH701	Entrepreneurship Development	3	1	0	4	30	-	30	70	-	70	100
UPETRCH702	Petrochemical Technology	3	1	0	4	30	-	30	70	-	70	100
UPROCCH703	Process Equipment Design	3	1	0	4	30	-	30	70	-	70	100
UENERCH704	Energy Technology	3	0	0	3	30	-	30	70	-	70	100
UFERTCH705	Fertilizer Technology	3	0	0	3	30	-	30	70	-	70	100
UINDUCH706	Energy Technology - Lab	0	0	2	1	-	25	25	-	25	25	50
UMINOCH707	Minor Project	0	0	2	1	-	25	25	-	25	25	50
UINDUCH708	Industrial Training	0	0	2	1	-	25	25	-	25	25	50
Total		15	3	6	21	150	75	225	350	75	425	650

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IV Year Semester-VII

L	T	P
3	1	0

UENTRCH701:ENTREPRENEURSHIP DEVELOPMENT

UNIT- I

Entrepreneurship- definition. growth of small scale industries in developing countries and their positions vis-a-vis large industries; role of small scale industries in the national economy; characteristics and types of small scale industries; demand based and resources based ancillaries and sub-control types. Government policy for small scale industry; stages in starting a small scale industry.

UNIT -II

Project identification- assessment of viability, formulation, evaluation, financing, field-study and collection of information, preparation of project report, demand analysis, material balance and output methods, benefit cost analysis, discounted cash flow, internal rate of return and net present value methods.

UNIT -III

Accountancy- Preparation of balance sheets and assessment of economic viability, decision making, expected costs, planning and production control, quality control, marketing, industrial relations, sales and purchases, advertisement, wages and incentive, inventory control, preparation of
financial reports, accounts and stores studies.

UNIT -IV

Project Planning and control:

The financial functions, cost of capital approach in project planning and control. Economic evaluation, risk analysis, capital expenditures, policies and practices in public enterprises. profit planning and programming, planning cash flow, capital expenditure and operations. control of financial flows, control and communication.

UNIT -V

Laws concerning entrepreneur viz, partnership laws, business ownership, sales and income taxes and workman compensation act. Role of various national and state agencies which render assistance to small scale industries.

Text / Reference Books:

1. Forbat, John, ―Entrepreneurship‖ New Age International.
2. Havinal, Veerbhadrappa, ―Management and Entrepreneurship‖ New Age International
3. Joseph, L. Massod, ―Essential of Management", Prentice Hall of India.

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L	T	P
3	1	0

UPETROCH702:PETROCHEMICAL TECHNOLOGY

Unit 1

Production and consumption pattern of petrochemicals in India, Feedstocks for petrochemicals-Natural gas, LPG, Refinery off-gases, Hydroforming of petroleum stocks, Naphtha and fuel oils, Petroleum coke

Unit 2

Steam reforming and partial oxidation processes for syngas, Manufacture of Methanol, Formaldehyde, Chloromethanes, Trichloroethylene, Perchloroethylene, Acetic acid, adipic acid

Unit 3

Ethylene and acetylene via steam cracking of hydrocarbons, Manufacture of Ethylene dichloride, Vinyl chloride, Ethylene oxide, Ethanolamines, Acetaldehyde, Vinyl acetate, Ethyl acetate, Ethylene glycol

Unit 4

Manufacture of Isopropanol, Acetone, Methyl ethyl ketone, Methyl isobutyl ketone, Cumene, Acrylonitrile, Propylene oxide, Butadiene, Oxo process

Unit 5

Manufacture of Benzene, Toluene, Xylenes, Phenol, Styrene, Phthalic anhydride, Maleic anhydride, Nitrobenzene, Aniline, Bisphenol-A, Caprolactum

Books Recommended:

1. Mall, I D, Petrochemical Process Technology, McMillan India
2. Rao Bhaskar, Modern Petroleum Refining Processes, Oxford & IBH Publishing
3. Speight J., Chemistry & Technology
4. Robert Mayer, Handbook of Petroleum Refining Processing, McGraw Hill

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L	T	P
3	1	0

UPETROCH703: PROCESS EQUIPMENT DESIGN

UNIT-I

Introduction , Basic design procedure and theory , Heat exchanger analysis: the effectiveness NTU method , Overallheat-transfer coefficient , Fouling factors (dirt factors) ,Shell and tube exchangers: construction details , Heat exchangerstandards and codes ,Tubes , Shells , Tube-sheet layout (tube count) ,Shell types (passes) , Shell and tubedesignation ,Baffles , Support plates and tie rods , Tube sheets (plates) ,Shell and header nozzles (branches) ,Flow inducedtube vibrations ,Mean temperature difference (temperature driving force) , Shell and tube exchangers:general design considerations , Fluid allocation: shell or tubes ,Shell and tube fluid velocities ,Stream temperatures , Pressure drop ,Fluid physical properties ,Tube-side heat-transfer coefficient and pressure drop (single phase) ,Heat transfer , Tube-side pressure drop ,Shell-side heat-transfer and pressure drop (single phase) ,Flow
pattern , Design methods ,Kern's method ,Bell's method , Shell and bundle geometry ,Effect of fouling on pressure drop , Pressure droplimitations.

UNIT –II

Condensers ,Heat-transfer fundamentals , Condensation outside horizontal tubes ,Condensation inside and outside vertical tubes , Condensation inside horizontal tubes , Condensation of steam , Mean temperature difference , Desuperheating and sub-cooling Condensation of mixtures Pressure drop in condensers , Design of forced circulation reboilers , Design of thermosyphon reboilers ,Design of kettle reboilers , Heat transfer to vessels Jacketed vessels , Internal coils , Agitated vessels .

UNIT –III

Design methods for binary distillation systems , Basic equations , McCabe-Thiele method ,Low product concentrations , The Smoker equations ,Batch distillation , Steam distillation, Plate efficiency, Prediction of plate efficiency :O'Connell's correlation , Van Winkle's correlation , AIChE method , Entrainment , Approximate column sizing , Plate contactors , Selection of plate type , Plate construction , Plate hydraulic design,Plate-design procedure, Plate areas ,Diameter , Liquid-flow arrangement ,Entrainment ,Weep point , Weir liquid crest , Weir dimensions , Perforated area , Hole Size , Hole pitch ,Hydraulic gradient ,Liquid throw , Plate pressure drop , Downcomer design.

UNIT–IV

Design of packed columns for absorption/stripping, Types of packing, Packed-bed height- Prediction of the height of a transfer unit (HTU), Prediction of the number of transfer units (NTU), Column diameter (capacity) , Column internals , Wetting rates , Column auxiliaries

UNIT –V

Analysis of Cost Estimates: Factors affecting investment and production costs, Capital investment, Types of capital cost estimates, Methods for estimating capital investment, Estimation of Revenue, Estimation of total product cost, Gross Profit, Net Profit and Cash flow Simple and Compound interest, Loan Payments, Cash flow pattern –Discrete cash flow & Continuous cash flow, Profitability, Alternative investments by different profitability methods, Effect of inflation on profitability analysis, Methods of profitability evaluation for replacements. Depreciation: Straight line, Declining balance, Double declining balance, sum-of-the-digit, Sinking-fund, Accelerated cost recovery system, Modified accelerated cost recovery system.

BOOKS:

1. Towler G. and Sinnott R. K., ―Chemical Engineering Design: Principles, Practice and Economics of Plant and Process Design‖, Butterworth-Heinemann.2008
2. Seader J. D. and Henley E. J., ―Separation Process Principles‖, 2nd Ed., Wiley-India.2006
3. I.S.: 4503-1967, ―Indian Standard Specification for Shell and Tube Type Heat Exchangers‖, Bureau of Indian Standards.2007
4. Hewitt G. F., Shires G. L. and Bott T. R., ―Process Heat Transfer‖, CRC Press.1994
5. Serth R.W., ―Process Heat Transfer: Principles and Applications‖, Academic Press.2007
6. Coker A. K., ―Ludwig's Applied Process Design for Chemical and Petrochemical Plants‖, Vol. 1, 4th Ed., Gulf Publishers.2007
7. Ludwig E. E., ―Applied Process Design for Chemical and Petrochemical Plants‖, Vol. 2, 3rd Ed., Gulf Publishers.1997
8. Ludwig E. E., ―Applied Process Design for Chemical and Petrochemical Plants‖, Vol. 3, 3rd Ed., Gulf Publishers.
9. Peters M. S. and Timmerhaus K. D., ―Plant Design And Economics For Chemical Engineers‖, 5th Ed., McGraw Hill, International Ed.2004.

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IV Year Semester-VII

L	T	P
3	0	0

UENERCH704: ENERGY TECHNOLOGY

UNIT-I: Introduction: Conventional (fossil energy) and non-conventional (alternative energy) resources &reserves. Global Energy production & consumption pattern. Production &consumption pattern in India. Solid Fuels: Biomass, Wood and Charcoal. Classification & Rank of Coal, Peat ,Lignite, Sub-Bituminous coal, Bituminous coal, Anthracite coal, Cannel &Bog head coal. Physical Properties of coal, Proximate & Ultimate Analysis of Coal, Cleaning, washing & Storage of coal. Theory of coal Pyrolysis and Carbonization: Low Temperature Carbonization(LTC),HighTemperatureCarbonization(HTC),Horizontal & VerticalGas Retorts, Coke Ovens-Beehive& Byproduct Slot type. Recovery of byproducts. Details of Structural configuration and Operating principles.

UNIT –II:10L Liquid Fuels: Constitution of petroleum, theory of formation of crude petroleum oil.Characterization of crude oil & petroleum fuels. Operation and flow-sheet of crude distillation plant. Thermal & catalytic cracking and reforming processes, coking, visbreaking, Process of a typical Indian refinery. Parameters and testing logistics of petroleum products— Octane no.; Cetane no.; Aviation fuel,Power no.; Pour point; Smoke point; Char point; Cloud point; Flash point; Fire point; Aniline point and Diesel index. Liquid fuel from coal: Bergius and Fischer Tropsch process. Other Synthetic Liquid fuels.(Benzol,shaleoil,Gashol, power alcohol Colloidal fuel).

Module III: 10L Gaseous Fuels: Classification of gaseous fuel;Physico-chemical principles, Calorific Value, Wobbes index, and flame speed. Flow sheet &operation of Producer gas, Water gas, Carburetted water gas, oil gas, coke-oven gas, blast furnace gas, Natural Gas and LPG. Coal Bed Methane.

UNIT –III: 10 L Solar Energy: Devices for measurement of solar flux. Different types of Solar collectors (Flat plate,parabolic,concentric&heliostat), Utilization of Solar Energy- For room heating, water heating other industrial uses -solar Pond, Photovoltaic cells, Chemical storage etc. Geothermal Energy & Wind Energy: Utilization of Geo thermal Energy;Operating principles of different types of Wind Energy Mills. Energy from Ocean Nuclear energy:Sources of Nuclear fuels,Indian scenario; Nuclear reactions and power generation by Nuclear reactorsBreeder reactor- reaction &operation.

UNIT –IV: 10 L Solar Energy: Devices for measurement of solar flux. Different types of Solar collectors (Flat plate,parabolic,concentric&heliostat), Utilization of Solar Energy- For room heating, water heating other industrial uses -solar Pond, Photovoltaic cells, Chemical storage etc. Geothermal Energy & Wind Energy: Utilization of Geo thermal Energy;Operating principles of different types of Wind Energy Mills. Energy from Ocean Nuclear energy:Sources of Nuclear fuels,Indian scenario; Nuclear reactions and power generation by Nuclear reactorsBreeder reactor- reaction &operation.

Text Books:

1. Fuels & Combustion: Dr. Samir Sarkar,Orient Longmans
2. Elements of Fuels. Furnace and Refractories

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L	T	P
3	0	0

UFERTCH705: FERTILIZER TECHNOLOGY

Unit I Introduction of Indian fertilizer industries, types of fertilizers process details. [8]

Unit II Manufacture of Nitrogeneous, Phosphatic, potassic, complex, NPK, mixed, Dio and other fertilizers.

Unit III Discussion of existing Indian plants pollution and its control, abetment and disposal of waste of fertilizer units.

Unit IV Retrofits and modernization, computer control and Instrumentation, Energy conservation and diversification.

Unit V Design of Ammonia converters and other reactors, cooling water, expansion, capacity utilization and other problem of fertilizers industry.

Books: 1.Mortvedt J.J.,Murphy L.S.& Follett R.H., Fertilizer Technology & Application, Meister Publishing Company 2. Shreves Chemical Process Industries, McGraw Hill 3. Drydens Outlines of Chemical Technology, East West Press

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L	T	P
0	**0**	**2**

UENERCH706: ENERGY TECHNOLOGY-LAB

1. Determination of composting of the supplied sample of Coal by Proximate Analysis.
2. To find the effect to temperature on viscosity of the supplied samples of liquid fuel using Red wood viscometer/ lubricating oil using Engler's Viscometer.
3. To find the Flash and Fire point of the supplied samples of liquid fuel using (i) Penslery Martein closed cup apparatus (ii) Abel open cup apparatus.
4. To find the Aniline point of the supplied samples of liquid fuels using Aniline point apparatus and hence find out the Diesel Index Number of the Diesel oil.
5. To find the moisture content of the supplied samples of liquid fuel/ Crude oil using Dean and Stark apparatus.
6. To find the Pour point and Solidification point of the supplied samples of liquid fuels.
7. To determine the Gross calorific value of the supplied sample of coal using Bomb Calorimeter (on ash free basis).
8. To determine the Smoke Point of Kerosene oil using Smoke Point appar.

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L	T	P
0	0	2

UMINOCH707: MINOR PROJECT

The students would be allotted an industrial project or any Research Project in the beginning of the VII semester itself. He/ She may continue this project in details, later in the (8^{th}) semester. The assessment of ESE will be done the faculty member of the other department within the same institute.

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L	T	P
0	0	2

UINDUCH708: INDUSTRIAL TRAINING	
Credit:1	**Max Marks:50**
6 WEEKS / 45 DAYS - IDUSTRY WORK EXPERIENCE WITH TRAINING REPORT & CERTIFICATE	

EVALUATION SCHEME
B.TECH. CHEMICAL ENGINEERING
4th Year (8th Semester)

STUDY AND EVALUATION SCHEME FOR B.TECH CHEMICAL ENGINEERING

SEMESTER-VIII

SUBJECT CODE	SUBJECTS NAME	STUDY SCHEME Periods/Week			Credits	Marks In Evaluation Scheme						Total Marks of Internal & External
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT			
		L	T	P		Th	Pr	Tot	Th	Pr	Tot	
UNONCCH801	Non-Conventional Energy Resources	3	0	0	3	30	-	30	70	-	70	100
UPLANCH802	Plant Design & Project Engineering	3	1	0	4	30	-	30	70	-	70	100
UPROCCH803	Process Utility & Safety In Chemical Plant	3	1	0	4	30	-	30	70	-	70	100
UPETRCH804	Petroleum Engineering	3	0	-	3	30	-	30	70	-	70	100
USEMICH805	Seminar	-	0	2	1		25	25		25	25	50
UPROJCH806	Major Project	-	0	12	7		100	100		200	200	300
Total		12	2	14	22	120	125	245	280	225	505	750

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L	T	P
3	0	0

UNONCCH801: NON-CONVENTIONAL ENERGY RESOURCES

UNIT-I Introduction Various non-conventional energy resources- Introduction, availability, classification, relative merits & demerits.
Solar Cells: Theory of solar cells. solar cell materials, solar cell array, solar cell power plant, limitations.
UNIT-II Solar Thermal Energy:
Solar radiation, flat plate collectors and their materials, applications and performance, focusing of collectors and their materials, applications and performance; solar thermal power plants, thermal energy storage for solar heating and cooling, limitations.

UNIT-III Geothermal Energy:
Resources of geothermal energy, thermodynamics of geo-thermal energy conversion-electrical conversion, non-electrical conversion, environmental considerations.
Magneto-hydrodynamics (MHD):

Principle of working of MHD Power plant, performance and limitations.
Fuel Cells:
Principle of working of various types of fuel cells and their working, performance and limitations.
UNIT-IV
Thermo-electrical and thermionic Conversions:
Principle of working, performance and limitations.
Wind Energy:
Wind power and its sources, site selection, criterion, momentum theory, classification of rotors, concentrations and augments, wind characteristics. performance and limitations of energy conversion systems.

UNIT-V Bio-mass: Availability of bio-mass and its conversion theory.

Ocean Thermal Energy Conversion (OTEC):
Availability, theory and working principle, performance and limitations.
Wave and Tidal Wave: Principle of working, performance and limitations. Waste Recycling Plants.

Text/References Books:

1. Raja etal, ―Introduction to Non-Conventional Energy Resources‖ Scitech Publications.
2. John Twideu and Tony Weir, ―Renewal Energy Resources‖ BSP Publications, 2006.
3. M.V.R. Koteswara Rao, ― Energy Resources: Conventional & Non-Conventional ― BSP Publications,2006.
4. D.S. Chauhan,‖Non-conventional Energy Resources‖ New Age International.
5. C.S. Solanki, ―Renewal Energy Technologies: A Practical Guide for Beginners‖ PHI Learning.

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L	T	P
3	1	0

UPLANCH802: PLANT DESIGN & PROJECT ENGINEERING

Unit 1

Project identification, preliminary techno-economic feasibility, laboratory development and research, pilot plant level studies, scale-up methods. Process selection, alternative processes. Flow sheet preparation, different components of PFD, equipment numbering, stream designation, battery limit and off sites

Unit 2

Selection of process equipments, standard versus special equipments, selection Criteria, specification sheet of equipment, Process auxiliaries - piping design, layout, process control and instrumentation, Process utilities- process water, boiler-feed water, waste treatment & disposal, oil heating system, chilling plant., compressed air, instrumentation air.

Unit 3

Interest-types & calculations, Cost estimation-factors involved in project cost estimation, total capital investment, fixed capital and working capital, process equipment cost estimation. Cost index and scaling for equipment cost. Estimation of total product cost-factors involved

Unit 4

Depreciation-types & methods of determination, Profitability – criteria of profitability, payout period, return on investment, present value, cash flow analysis, alternative investment and replacement methods, factors in alternative & replacement investment, project profitability analysis

Unit 5

Project management, scheduling a project using CPM/PERT, Inventory control methods, Optimum conditions- production schedule, optimum production rates in plant operations, optimum conditions in batch and cyclic operations, Design reports, Plant location and layout principles- factors involved, case studies for specific plants

Text Books:

(1) Peters, M. S. and Timmerhaus, K. D., "Plant Design & Economics for Chemical Engineers", McGraw Hill
(2) Vilbrandt and Dryden, "Chemical Engineering Plant Design", McGraw Hill
(3) Ulrich, G. D., "A Guide to Chemical Engineering Process Design & Economics", John Wiley and Sons

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L	T	P
3	1	0

UPROCCH803: PROCESS UTILITY & SAFETY IN CHEMICAL PLANT

Unit -1 Various process utilities, their role and importance in chemical plants. Water Sources of water and their characteristics: Treatment storage and distribution of water; water for use in boilers, cooling purposes, drinking and process; Reuse and conservation of water: Water resource management.

Unit-2 Steam Generation and Utilization
Steam Generation and its application in chemical process plants, distribution and utilization: Design of efficient steam heating systems: steam economy, steam condensers and condensate utilization Expansion joints, flash tank design, steam traps their characteristics, selection and application, waste heat utilisation; Lagging, selection and thickness. Selection and sizing of boilers; waste heat boilers.
Unit-3 Compressors, blowers and Vacuum Pumps
Compressors, blowers and vacuum pumps and their performance characterisstics; Methods of developing vacuum and their limitations, material handling under vacuum, Piping systems; Lubrication and oil removal in compressors and pumps. Air filters. Air gas leakage. Inert gas systems. Compressed air for process, Instrument air.
Insulation Importance of insulation for meeting the process requirements, installation materials and their effect on various material of equipment piping, fitting and valves etc, insulation for high intermediate, low and sub zero temperatures, including cryogenic insulation.
Unit-4
Elements of safety Elements of safety, safety and site selection; Plant and unit plot planning; Definition of risk and hazard Identification and assessment of the hazard and risk, Industrial between hazards and risk, Industrial hygiene, toxicological studies, Hazard operability (HAZOP) hazard analysis (HAZAN);
Assessment of the risk, fault tree, event tree, scope of risk assessment; control of hazards, controlling toxic chemicals and controlling flammable materials. Prevention of losses Prevention of losses, Pressure relief, fire & explosions, Provision of fire fighting equipment, Technology selection and transfer, choosing the right process.
Unit -5 Control of Process
Control of process, Prevention of hazardous deviation in process variable, e.g. pressure, temperature
flow by Provision of automatic control systems-interlocks, alarms, trips together with good operating practices and management. Accidental analysis, Regulations and legislation, Role of gevemment role,risk management routines and tackling disaster,case studies.

Text Books:
1. Nordell Eskel, ―Water Treatment for Industrial and Other Uses‖, Reinhold Publishing Corporation, New York. (1961)
2. Crowl, D.A. & Louvar, J.F.. ―Chemical Process Safety: Fundamentals with applications‖, New Jersey: Prentice-Hall. (1989)
3. Goodall, P.M., ―The Efficient use of Steam‖ IPC Science and Technology (1980).

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L	T	P
3	0	0

UPETRCH804: PETROLEUM ENGINEERING

Unit I -Petroleum Exploration Production and Refining of Crude oils Crude oils: Chemistry and composition (Characteristics and constituents of crude oils, Classification of crude oils). **Unit II** Quality Control of Petroleum Products Classification of laboratory tests, distillation, vapour pressure, flash and fire points, octane number, performance number, cetane number, aniline point, viscosity index, calorific value, smoke point, char value, viscosity, viscosity index, penetration tests, cloud and pour points, drop point of grease, melting and settling points of wax, softening point of Bitumen, induction period of gasoline, thermal stability of jet fuels, gum content, Total Sulphur, Acidity and Alkalinity,, Copper Strip Corrosion Test, Silver – Strip Corrosion Test for ATF, Ash, Carbon Residue (Conradson method, Ramsbottom method) Colour, Density and Specific gravity, Refractive index of hydrocarbon liquids, water separation index (modified) (WSIM), ductility.

Unit III Petroleum Products Composition, Properties & Specification of LPG, Naphthas, motor spirit, Kerosine, Aviation Turbine Fuels, Diesel Fuels, Fuel Oils, Petroleum Hydrocarbon Solvents, Lubricating oils (automotive engine oils, industrial lubricating oils electrical insulating oils, Jute Batching oils, white oils, steam turbine oils, metal working oils, etc.) Petroleum Waxes Bitumens, Petroleum coke. Crude Oil Distillation Desalting of crude oils, Atmospheric distillation of crude oil, Vacuum distillation of atmospheric residue. Thermal Conversion Process Thermal Cracking Reactions, Thermal Cracking, Visbreaking, (Conventional Visbreaking and Soaker Visbreaking) Coking (Delayed Coking, Fluid Coking, Flexicoking), Calcination of Green Coke.

Unit IV Catalytic Converson Process Fluid catalytic cracking; Catalytic reforming; Hydrocracking Catalytic Alkylation, Catalytic Isomerization; Catalytic Polymerization. Finishing Process Hydrogen sulphide removal processes; Sulphur conversion processes; Sweetening processes (Caustic treatment, Solutizer process; Doctor treating process; Copper chloride sweetening,; Hypochlorite sweetening ;Air and inhibitor treating process; Merox processes;Sulphuric acid treatment; Clay treatment); Solvent extraction processes (Edeleanu process, Udex process, Sulfolane process), Hydrotreating processes.

Unit V Lube Oil Manufacturing Process Evaluation of crude oils for lube oil base stocks, Vacuum distillation, Solvent deasphalting Solvent extraction of lube oil fractions (Furfural, NMP and Phenol), Solvent dewaxing, Hydrofinshing, Manufacture of petroleum waxes (Wax sweating, Solvent deoiling) Manufacture of Bitumens Selection of crude oil, Methods of manufacture of bitumens, (Distillation, Solvent 45 precipitation, Air blowing).

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USEMICH805: SEMINAR

Students have to present a detailed power point presentation on their own project topics. Tjis seminar will help them to enhance their personality.

L	T	P
0	**0**	**2**

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IV Year Semester-VIII

L	T	P
0	**0**	**2**

UMAJOCH806:MAJOR PROJECT

This project course may be in continuation of Project allotted in the beginning of the VII semester. Here, the students are supposed to do the detailed work as scheduled in the last semester. Finally, he/she will be required to submit the detailed project report on which viva-voice examination will be conducted by a committee having at least one external examiner.