Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)
SCHEME OF STUDIES & EXAMINATIONS B.Tech. Final YEAR (SEMESTER – VII)
MECHANICAL ENGINEERING Credit Based Scheme w.e.f. 2015-16

S. No.	Course No.	Course Title	Teaching Schedule L	T	P	Marks of Class work	Examination Marks Theory	Practical	Total	Credit	Duration of Exam
1	ME 401B	AUTOMOBILE ENGG.	4	-	-	25	75	-	100	4	3
2	ME 403 B	REFERIGERATION & AIR CONDITIONING (ME, AER)	3	1	-	25	75	-	100	4	3
3	ME 405 B	OPERATIONS RESEARCH (ME, AER)	4	0	-	25	75	-	100	4	3
4		*OPEN ELECTIVE	4	0	-	25	75	-	100	4	3
5	ME 407 B	POWER PLANTS ENGINEERING	3	1	-	25	75	-	100	4	3
6	ME 409 B	AUTOMOBILE ENGG. LAB	-	-	2	20		30	50	1	3
7	ME 411 B	R.A.C.LAB (ME, AER)	-	-	2	20		30	50	1	3
8	ME 413 B	PROJECT	-	-	4	100	-	-	100	4	-
9	ME 415 B	PROFESSIONAL TRAINING-II	-	-	2	50	-	-	50	2	-
Total			**18**	**2**	**10**	**315**	**375**	**60**	**750**	**28**	

*** List of Open Electives**

1	MEI 623B	ENTREPRENEURSHIP	6	BT401B	BIOINFORMATICS
2	BME451B	MEDICAL INSTRUMENTATION	7	AE417B	MODERN VEHICLE TECHNOLOGY
3	ECE305B	CONSUMER ELECTRONICS	8	CE451B	POLLUTION & CONTROL
4	EE451B	ENERGY AUDIT	9	CSE411B	MANAGEMENT INFORMATION SYSTEM
5	EEE457B	ENERGY RESOURCES & TECHNOLOGY	10	IT413B	CYBER SECURITY

Note:

23 Every stu d ent has to p articip ate in the sp orts activities. Minim u m one hou r is fixed for sp orts activities either in the morning or evening. Weightage of Sports is given in General Proficiency Syllabus.

24 Stu d ents w ill be p erm itted to op t for any one elective ru n by the other d ep artm ent. H ow ever, the d ep artm ent shall offer those elective for w hich they have exp ertise. The choice of the stu d ents for any elective shall not be bind ing for the d ep artm ent to offer, if the d ep artm ent d oes not have exp ertise. **The minimum strength of the students should be 20 to run an elective course.**

25 Assessm ent of Professional Training-II, u nd ergone at the end of VI sem ester, w ill be based on sem inar, viva-voce, rep ort and certificate of Professional Training obtained by the stu d ent from the ind u stry, institute, research lab, training center etc

26 The stu d ents w ill be allow ed to u se non -p rogram m able scientific calcu lator. H ow ever, sharing/exchange of calculator is prohibited in the examination.

27 Electronics gadgets including Cellular phones are not allowed in the examination.

28 Project coord inator w ill be assigned the p roject load of m aximu m of 2 hrs. p er w eek inclu d ing his ow n gu id ing load of one hr. H ow ever, the gu id ing teacher w ill be assigned m axim u m of one p eriod of teaching load irrespective of number of students/groups under him/her.

ME 401B AUTOMOBILE ENGG.

B. Tech. Semester – VII (Mechanical Engineering)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
3	**1**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT I

IN TROD UCTION TO AUTOMOBILES : Classification, Com p onents, Requ irem ents of Au tom obile Bod y; Vehicle Frame, Separate Bod y & Fram e, Unitised Bod y, Car Bod y Styles, Bu s Bod y & Comm ercial Vehicle Bod y Typ es; Front Engine Rear Drive & Front Engine Front Drive Vehicles, Fou r Wheel Drive Vehicles, Safety considerations; Safety features of latest vehicle; Future trends in automobiles.

CLUTCHES : Requirement of Clutches – Principle of Friction Clutch – Wet Type & Dry Types; Single Plate Clutch, Diaphragm Spring Clutch, Multi plate Clutch, Centrifugal Clutches, Electromagnetic Clutch, Over Running Clutch; Clutch Linkages.

UNIT II

POWER TRAN SMISSION : Requ irem ents of transm ission system ; General Arrangem ent of Pow er Transm ission system ; Object of the Gear Box; Different typ es of Gear Boxes; Slid ing Mesh, Constant Mesh, Synchro- m esh Gear Boxes; Ep i-cyclic Gear Box, Freew heel Unit. Overd rive u nit-Principle of Overd rive, Advantage of overdrive, Transaxle, Transfer cases.

D RIVE LIN ES, UN IVERSAL JOIN T, D IFFEREN TIAL AN D D RIVE AXLES: Effect of d riving thru st and torqu e reactions; H otchkiss Drive, Torqu e Tu be Drive and rad iu s Rod s; Prop eller Shaft, Universal Joints, Slip Joint; Constant Velocity Universal Joints; Front Wheel Drive; Principle, Function, Construction & Operation of Differential; Rear Axles, Typ es of load on Rear Axles, Fu ll Floating, three qu arter Floating and Sem i Floating Rear Axles.

UNIT III

SUSPEN SION SYSTEMS : N eed of Su sp ension System, Typ es of Su sp ension; factors influ encing rid e comfort, Suspension Spring; Constructional details and characteristics of leaf springs.

STEERIN G SYSTEM : Front Wheel geom etry & Wheel alignm ent viz. Caster, Cam ber, King p in Inclination, Toe-in/Toe-ou t; Cond itions for tru e rolling m otions of Wheels d u ring steering; Different typ es of Steering Gear Boxes; Steering linkages and layou t; Pow er steering – Rack & Pinion Pow er Steering Gear, Electronics steering.

UNIT IV

AUTOMOTIVE BRAKES, TYRES & WHEELS : Classification of Brakes; Principle and constru ctional d etails of Dru m Brakes, Disc Brakes; Brake actu ating system s; Mechanical, H yd rau lic, Pneu m atic Brakes; Factors affecting Brake p erformance, Pow er & Pow er Assisted Brakes; Tyres of Wheels; Types of Tyre & their constructional details, Wheel Balancing, Tyre Rotation; Types of Tyre wear & their causes.

EMISSION CONTROL SYSTEM & AUTOMOTIVE ELECTRICAL : Sources of Atmospheric Pollution from the automobile, Emission Control Systems – Construction and Operation of Positive Crank Case Ventilation (PVC) Systems, Evaporative Emission Control, Heated Air Intake System, Exhaust Gas Recirculation (ECR) Systems, Air Injection System and Catalytic Converters; Purpose construction &

operation of lead acid Battery, Capacity Rating & Maintenance of Batteries; Purpose and Operation of Charging Systems, Purpose and Operations of the Starting System; Vehicle Lighting System.

TEXT BOOKS:

Automobile Engineering by Anil Chhikara, Satya Prakashan, New Delhi.
Automobile Engineering by Dr. Kirpal Singh, Standard Publishers Distributors.

REFERENCE BOOKS:

Automotive Mechanics – Crouse / Anglin, TMH.
Automotive Technology – H.M. Sethi, TMH, New Delhi.
Automotive Mechanics – S.Srinivasan, TMH, New Delhi.
Automotive Mechanics – Joseph Heitner, EWP.
Motor Automotive Technology by Anthony E. Schwaller – Delmer Publishers, Inc.
The Motor Vehicle – Newton steeds Garrett, Butter Worths.

Note:

In the sem ester exam ination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram m able calcu lator and cellu lar phone will not be allowed.

ME 403B REFERIGERATION & AIR CONDITIONING

B. Tech. Semester – VII (Mechanical & Aeronautical Engineering)

L	T	P	Credits				
3	1	--	4		Class Work	:	25 Marks
					Examination	:	75 Marks
					Total	:	100 Marks
					Duration of Examination	:	3 Hours

UNIT-I

INTRODUCTION: Definition of refrigeration & air cond itioning; N ecessity; Method s of refrigeration; Unit of refrigeration; Coefficient of p erform ance (COP), Fu nd am entals of air-cond itioning system ; Refrigerants- Definition, Classification, N om enclatu re, Desirable p rop erties; Second ary refrigerants; Eco-friend ly refrigerants and environm ental issu es of refrigeration & air conditioning industry.

AIR REFRIGERATION SYSTEM: Carnot refrigeration cycle, tem p eratu re limitations; Brayton refrigeration or the Bell Colem an air refrigeration cycle; N ecessity of cooling the aero p lane; Air craft refrigeration system s, Sim p le cooling and Sim p le evap orative typ es, Boot strap and Boot strap evaporative types, Regenerative type and Reduced Ambient type system; problems.

UNIT II

VAPOR COMPRESSION REFRIGERATION (VCR) System s: Sim p le Vapor Com p ression (VC) Refrigeration system s, Lim itations of Reversed Carnot cycle w ith vap or as the refrigerant; analysis of VCR cycle consid ering d egrees of su b cooling and su p erheating; VCR cycle on p -v, t-s and p -h d iagram s; Effects of op erating cond itions on COP; Liqu id su ction heat exchanger; actu al VCR cycle; comparison of VC cycle with Air Refrigeration cycle, Problems.

MULTISTAGE REF. SYSTEMS- Necessity of compound compression, Compound VC cycle , Inter-cooling w ith liqu id su b –cooling and / or w ater inter cooler: Mu ltistage comp ression w ith flash inter-cooling and / or w ater inter-cooling; system s w ith ind ivid u al or m u ltiple exp ansion valves; Ind ivid u al com p ression system w ith ind ivid u al or m u ltip le exp ansion valves; Ind ivid u al com p ression systems w ith ind ivid u al or m u ltip le exp ansion valves bu t w ith and w ithou t intercoolers. Cascade refrigerating systems and its necessity; selection of pairs of refrigerants for the system; concept of cascade temperature, analysis, multistaging, applications, problems.

UNIT III

PSYCHROMETRY of Air & Air Cond itioning Processes: p rop erties of m oist Air, Gibbs Dalton law , Sp . hu m id ity, Dew p oint tem p eratu re, Degree of satu ration, Relative hu m id ity, Enthalp y, H u m id sp ecific heat, Wet bu lb tem p eratu re. Psychrom etric chart; Psychrom etry of air-conditioning

processes- Mixing Process and other basic processes in conditioning of air; Psychrometric processes in air-conditioning equipment like in air washer etc, Problems.

AIR- CON D ITION IN G LOAD CALCULATION S: Ou tsid e and insid e d esign cond itions; Sou rces of heating load ; Sou rces of cooling load ; H eat transfer throu gh stru ctu re, Solar rad iation, Electrical ap p lications, Infiltration and ventilation, H eat generation insid e cond itioned sp ace; Com fort chart, Design of su m m er air-cond itioning and Winter air cond itioning system s, Problems. Air Cond itioning System s w ith Controls & Accessories: Classifications, Layou t of p lants; Equ ip m ent selection; Air d istribu tion system ; Du ct system s Design; Filters; Refrigerant p ip ing. Tem p eratu re, Pressure, Humidity sensors; Actuators and Safety controls, Accessories.

UNIT IV

OTHER REFRIGERATION SYSTEMS: Vap or Absorp tion Refrigeration System s – Basic System s; COP of the System , Perform ance, Relative m erits and d emerits; Prop erties of aqu a amm onia; Electrolu x Refrigeration; Stu d y of Lithiu m brom id e w ater system . Steam Jet Refrigerating System - Introduction, Analysis, Relative merits and demerits, Performance Applications; problems

REFRIGERATION AN D AIR CON D ITION IN G EQUIPMEN TS: Typ e of com p ressors and their performance curves; types of Condensers; types of expansion devices; types of evaporators. Cooling and dehumidifying coils and cooling towers.

TEXT BOOKS:

Refrigeration & Air conditioning –R.C. Jordan and G.B. Priester, Prentice Hall of India.
Refrigeration & Air conditioning –C.P. Arora, TMH, New Delhi.

REFERENCE BOOKS:

A course in Refrigeration & Air Conditioning – Arora & Domkundwar, Dhanpat Rai & Sons.

Refrigeration & Air conditioning –W.F. Stocker and J.W. Jones, TMH, New Delhi.

Refrigeration & Air conditioning- Manohar Prasad, Wiley Eastern limited, New Delhi.

Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.

ME 405B OPERATIONS RESEARCH							
B. Tech. Semester – VII (Mechanical & Aeronautical Engineering)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
3	**1**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT-I

OPERATION S RESEARCH –AN OVERVIEW- Introd u ction, history, ap p roach, techniqu es and tools, applications of OR, phases and processes of OR study, limitations of OR.

LIN EAR PROGRAMMIN G- Introduction, Form u lation, red u nd ant constraints, Solu tion-Grap hical and Simplex, Gauss-Jordan reduction process in simplex methods, BIG M methods computational problems.

UNIT II

TRANSPORTATION PROBLEM- Introduction, , Basic feasible solu tion of a transportation p roblem - North-West corner, matrix m inimu m and Vogel's Ap p roxim ation m ethod , Method s for checking op tim ality of the solu tion - Step p ing stone and MODI m ethod , Unbalanced Transp ortation p roblem Degenerate transportation problem. Maximisation in Transportation Problem, computational problems.

ASSIGN MEN T PROBLEM- Introd u ction, solu tion of an assignm ent p roblem - H u ngarian Method , Unbalanced Assignment problem, computational problems

ADVANCED TOPICS IN OR- Duality, Primal- Dual relationship, Economic interpretation, Shadow price, Post optimality and sensitivity analysis, problems

UNIT III

WAITIN G LIN E MOD ELS- Introd u ction, Elem ents of a qu eu ing system , operating characteristics of a queuing system, queue parameters, M/M/1 queue, problems

NETWORK AN ALYSIS IN PROJECT PLAN N IN G (PERT AN D CPM)- Introd u ction, netw ork d iagram , event activity, critical path method, PERT, Cost analysis and Crashing the Network, Problems.

UNIT IV

SIMULATION- Introduction, advantages of simulation, limitations of simulation, Monte Carlo Simulation and its application in industries, Problems.

D ECISION THEORY- Decision Process, SIMON mod el, typ es of d ecision m aking environm ent-certainity, risk, uncertainity, decision making with utilities, problems.

Text Books:

Quantitative Techniques by N D Vohra, TMH New Delhi
Operations Research Theory and applications by J.K.sharma, Macmillan

Reference Books:

Operations Research by Hamdy A. Taha- PHI New Delhi
Note:

0 In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

ME 407B POWER PLANTS ENGINEERING

B. Tech. Semester – VII (Mechanical Engineering)

L	T	P	Credits		Class Work	:	25 Marks
3	1	--	4		Examination	:	75 Marks
					Total	:	100 Marks
					Duration of Examination	:	3 Hours

UNIT-I

INTRODUCTION: Energy resources and their availability, types of power plants, selection of the plants, review of basic thermodynamic cycles like Rankine, Brayton, Binary vapor power cycle, Combined cycle etc used in power plants. Environmental aspect's of power generation.

POWER PLANT ECONOMICS: Load curve, different terms and definitions, cost of electrical energy, tariffs methods of electrical energy, performance & operating characteristics of power plants- incremental rate theory, input-output curves, efficiency, heat rate, economic load sharing, Problems.

UNIT II

STEAM POWER PLANTS: Flow sheet and working of modern-thermal power plants, super critical pressure steam stations, site selection; Coal storage, Preparation, Coal handling systems, Feeding and burning of pulverized fuel, Ash handling systems, Dust collection system; electrostatic precipitator.

COMBINED STEAM AND GAS CYCLES: Constant pressure gas turbine power plants, Arrangements of combined plants, re-powering systems with gas production from coal, using PFBC systems, with organic fluids, parameters affecting thermodynamic efficiency of combined cycles; IGCC. Problems.

UNIT III

HYDRO ELECTRIC POWER PLANTS : Rainfall and run-off measurements and plotting of various curves for estimating stream flow and size of reservoir, power plants design, construction and operation of different components of hydro-electric power plants, site selection, comparison with other types of power plants.

NUCLEAR POWER PLANTS: Principles of nuclear energy, basic nuclear reactions, nuclear reactors-PWR, BWR, CANDU, Sodium graphite, Fast breeder, Homogeneous; Gas cooled . Advantages and limitations, Nuclear power station, waste disposal.

UNIT IV

NON-CONVENTIONAL POWER GENERATION : Solar energy -Solar radiation estimation, solar energy collectors, low , medium & high temperature power plants; OTEC; Wind power plants; Tidal power plants and Geothermal power plants.

DIRECT ENERGY CONVERSION SYSTEMS: Fuel cell, MHD power generation-principle, open & closed cycle's systems; thermoelectric power generation; thermionic power generation.

TEXT BOOKS:

Pow er station Engineering and Econom y by Bernhard t G.A. Skrotzki and William A. Vop at – Tata Mc Graw Hill Publishing Campany Ltd., New Delhi .

Power Plant Engineering : Manoj kumar Gupta, PHI learning ,First Edition 2012

REFERENCE BOOKS:

Power Plant Engg. : M.M. El-Wakil, McGraw Hill 1985.

Power Plant Engineering : P.K. Nag Tata McGraw Hill second Edition 2001

Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.

MEI 623B ENTREPRENEURSHIP

B. Tech. Semester – VII - Open Elective

L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
4	**-**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT-I

ENTREPRENEURIAL DEVELOPMENT PERSPECTIVE: Concepts of Entrepreneurship Development, Evolution of the concept of Entrepreneur, Entrepreneur Vs. Intrapreneur, Entrepreneur Vs. Entrepreneurship, Entrepreneur Vs. Manager, Attributes and Characteristics of a successful Entrepreneur, Role of Entrepreneur in Indian economy and developing economies with reference to Self-Employment Development, Entrepreneurial Culture

UNIT II

CREATIN G EN TREPREN EURIAL VEN TURE: Bu siness Planning Process, Environm ental Analysis - Search and Scanning, Id entifying p roblem s and op p ortu nities, Defining Bu siness Id ea, Basic Governm ent Proced u res to be complied with.

UNIT III

ENTREPRENEURSHIP DEVELOPMENT AND GOVERNMENT: Role of Central Government and State Government in promoting Entrepreneurship - Introduction to various incentives, subsidies and grants - Export Oriented Units - Fiscal and Tax concessions available; Role of Central/State agencies in the Entrepreneurship Development - District Industries Centers (DIC), Small Industries Service Institute (SISI), Entrepreneurship Development Institute of India (EDII), National Institute of Entrepreneurship & Small Business Development (NIESBUD), National Entrepreneurship Development Board (NEDB).

UNIT IV

PROJECT MANAGEMENT AND CASE STUDIES

Technical, Financial, Marketing, Personnel and Managem ent Feasibility, Estim ating and Financing fu nd s requ irem ent - Schem es offered by variou s com m ercial banks and financial
institu tions like IDBI, ICICI, SIDBI, SFCs, Ventu re Cap ital Fu nd ing, Why d o Entrep reneu rs fail - The Four Entrep reneu rial Pitfalls (Peter Dru cker), Case studies of Su ccessfu l Entrep reneu rial Ventu res, Failed Entrep reneu rial Ventures and Turnaround Ventures.

Texts and References:

Entrepreneurship: New Venture Creation - David H. Holt.
Entrepreneurship - Hisrich Peters.
The Culture of Entrepreneurship - Brigitte Berger.
Project Management - K. Nagarajan.
Dynamics of Entrepreneurship Development - Vasant Desai.
Entrepreneurship Development - Dr. P.C.Shejwalkar.
Thought Leaders - Shrinivas Pandit.
Entrepreneurship, 3rd Ed. - Steven Brandt.
Business Gurus Speak - S.N.Char.
The Entrepreneurial Connection - Gurmit Narula.

Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.

BME 451B MEDICAL INSTRUMENTATION							
B. Tech. Semester – VII – Open Elective							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
4	**-**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**

					Duration of Examination	**:**	**3 Hours**

UNIT-I

PHYSIOLOGY AND TRANSDUCERS: Cell and its structure – Action and resting – Potential propagation of action potential – Sodium pump – N ervou s system – CNS – PNS – N erve cell – Synapse – Card io p u lm onary system – Physiology of heart and lu ngs – Circu lation and resp iration – Transducers – Different typ es – Piezo-electric, ultrasonic, resistive, capacitive, inductive transducers – Selection criteria.

UNIT-II

ELECTRO – PHYSIOLOGICAL AN D N ON -ELECTRICAL PARAMETER MEASUREMEN TS: Basic components of a biom ed ical system – Electrodes – Micro, need le and su rface electrod es – Amplifiers – Pream p lifiers, d ifferential am p lifiers, chop p er amplifiers – Isolation am plifier. ECG – EEG – EMG – ERG – Lead system s and record ing methods – Typ ical w aveform s. Measu rem ent of blood p ressu re – Card iac ou tp u t – Card iac rate – H eart sou nd – Respiratory rate – Gas volu m e – Flow rate of CO_2, O_2 in exhau st air - PH of blood , ESR, GSR m easu rem ents – Plethysmography.

UNIT-III

MED ICAL IMAGIN G AN D PATIEN T MON ITORIN G SYSTEMS: X-ray m achine - Rad io grap hic and flu oroscop ic techniqu es – Com p u ter tom ograp hy – MRI – Ultrasonography – Endoscopy – Thermography – Different typ es of biotelem etry system s and p atient m onitoring – Electrical safety. Biological effects of X-rays and precautions.

UNIT-IV

ASSISTIN G AN D THERAPEUTIC EQUIPMEN TS: Pacemakers – Defibrillators – Ventilators – N erve and m u scle stimulators – Diathermy – Heart – Lu ng m achine – Au d io m eters – Dialyzers. Respiratory Instru m entation - Mechanism of respiration, Spirometry, Pnemuotachograph Ventilators.

TEXT BOOKS

Biom ed ical Instru m entation and Measu rem ents – Leslie Crom w ell and F.J. Weibell, E.A. Pfeiffer, PH I, 2nd Ed, 1980.

Medical Instrumentation, Application and Design – John G. Webster, John Wiley, 3rd Ed., 1998.

REFERENCE BOOKS

Principles of Applied Biomedical Instrumentation – L.A.Geoddes and L.E. Baker, John Wiley, 1975.

Hand-book of Biomedical Instrumentation – R.S. Khandpur, TMH, 2nd Ed., 2003.

Biomedical Telemetry – Mackay, Stuart R., John Wiley, 1

Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.

ECE 305B CONSUMER ELECTRONICS

B. Tech. Semester – VII – Open Elective

L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
4	**-**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT I

MON OCHROME TV (INTRODUCTION): Elem ents of a TV System ,Pictu re transmission,Sou nd transm ission,Pictu re recep tion,Sou nd recep tion,Synchronization,Receiver control,Im age continu ity, Scanning Process, Aspect Ratio, Flicker, Com p osite Vid eo Signal, Pictu re Elem ents,Kell factor, Vertical Resolu tion,H orizontal Resolu tion,Vid eo band w id th,Interlacing, 625 Line System ,Band w id ths for TV Transmission,Vertical and horizontal synch detail,Vestigial Side Band transmission(Advantages and Disadvantages)

MON OCHROME TV (PICTURE AN D CAMERA TUBES): Monochrom e p ictu re tu be,beam reflection,Beam focu ssing,Screen Phosp hor,Face p late,Pictu re tu be characteristics,pictu re tu be circu it controls,Monochrome Cam era Tubes:Basic principle,Image Orthicon, Vidicon,Plumbicon

UNIT II

COLOUR TV ESSEN TIALS: Com patibility , Colou r p ercep tion,Three Colou r theory,Lu m inance,H u e and Satu ration, Disp ersion and Recom bination of light,Prim ary and second ary colou rs,lu minance signal,Chrom inance Signal, Colou r p ictu re tu be,colou r TV Cam era,Colou t TV d isplay Tu bes,colou r Signal Transm ission,Band w id th for colour signal transmission,Colour TV controls. Cable TV,Block Diagram and principle of working of cable TV.

PLASMA AN D LCD : Introd u ction,liqu id crystals,typ es of LCD's,TN ,STN ,TFT,Pow er requ irem ents,LCD w orking,Princip le of op eration of TN d isp lay,Constru ction of TN d isp lay,Behaviou r of TN liqu id crystals,View ing angle,colour balance, colour TN display, limitatons, advantages, disadvantages, applications.

UNIT III

LED AN D D MD : Introd u ction to LED Television , com p arison w ith LCD and Plasma TV's, schem atic of DMD, introduction to Digital MicroMirror device, Diagram of DMD, principle of working, emerging applications of DMD.

MICROWAVE OVEN S AN D AIR CON D ITION ERS: Microwaves, Transit Tim e, Magnetron, Waveguides, Microw ave Oven, Microw ave Cooking. Air cond itioning,Comp onents of air cond itioning system s,all w ater Air conditioning systems,all air air conditioning Systems,Split air conditioner.

UNIT IV

MICROPHONES: Introd u ction, characteristics of m icrop hones,typ es of m icrop hone:carbon,m oving coil,wireless,crystal,introduction to tape recorder.

LOUDSPEAKER: Introd u ction to id eal and basic lou d sp eaker,lou d sp eaker constru ction typ es of lou d sp eaker: Dynamic and permanent magnet,woofers,tweeters,brief introduction to baffles,equalisers.

TEXT BOOKS :

1.Consumer Electronics by S. P. Bali(Pearson Education)

2.Complete Satellite and Cable T.V by R.R Gulati(New Age International Publishers)

REFERENCE BOOKS:

1. Monochrome and Colour Television by R. R. Gulati

Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.

EE 451B ENERGY AUDIT

B. Tech. Semester – VII – Open Elective

L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
4	**-**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT I

IN TROD UCTION TO THE POWER D ISTRIBUTION SYSTEM: Descrip tion of the pow er d istribu tion system- voltage levels, Com p onents of the d istribu tion system - Substation, Transform er, feed ers, distribution system p lanning, op eration & m aintenance objectives, activities involved in O&M, grid m anagem ent, load

sched u ling & d ispatch, load balancing, 66-33/ 11 KV su bstation equ ip m ent, 11/ 0.4 KV su bstation equ ip m ent, Distribution transformers- reasons for DT failures.

UNIT II

ENERGY ACCOUNTING & ENERGY AUDIT: Need for energy accounting, objectives & functions of energy accou nting, Energy flow d iagram in p ow er d istribu tion system , energy accou nting procedure- Energy measurement, and p roblem sin energy accou nting & overcom ing these p roblem s in energy accou nting, Definition, need and typ es of energy au d it, energy au d it instru m ents,p roced u re for cond u cting an energy audit.

UNIT III

AT&C LOSS RED UCTION & EFFICIEN CY IMPROVEMENT: Concep ts and p rinciples of d istribu tion losses- transm ission & d istribu tion losses, AT&C losses in p ow er d istribu tion netw ork, factors contribu ting to high technical & com m ercial losses. Technical loss red u ction- Short term m easu res for technical loss red u ction, long term p lans for technical loss red u ction, Com m ercial loss red u ction - reasons for com m ercial losses, measures for commercial loss reduction.

UNIT IV

D EMAN D SID E MAN AGEMEN T: An introd u ction, Why DSM?, Benefits of DSM, DSM in p ow er system s: load m anagem ent, DSM techniqu es and em erging trend s, EC Act 2001, DSM on consu m er sid e – the industrial sector, the agricultural sector, the domestic & commercial sectors, ESCO-a route for DSM.

TEXT BOOKS:

Handbook of Energy Engineering, The Fairmont Press, INC.-Albert Thumann& Paul Mehta.
Energy Management Supply & Conservation, Butterworth Heinemann, 2002-dr. Clive Beggs.

REFERENCE BOOKS:

Hand book on energy audit & environment management by ISBN 81-1993.0920 TERI

Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.

EEE457B ENERGY RESOURCES & TECHNOLOGY

B. Tech. Semester – VII – Open Elective

L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
4	**-**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT-I

ENERGY SOURCES & AVAILABILITY: World energy situation. Indian energy scenario. Comparative study of thermal, hydro, nu clear and gas power plants. Impact of thermal, gas, hyd ro and nuclear power stations on environment, air and water pollution, green house effect (global w arning), Plasma confinement - magnetic confinement and inertial confinement, geothermal, hyd rogen energy, fu el cells, Alkaline fu el cells (AFC), Solid oxide fuel cell (SOFC), Molten carbonate fu el cells (MCFC), thermo-electric power, MHD power generation OTEC & tid al waves.

UNIT-II

SOLAR EN ERGY: Solar constant, solar radiation geometry, local solar time, d ay length, solar rad iation measu rement, rad iation on inclined surface, solar radiation data & solar ch arts. Flat plate collectors , liqu id and air type. Theory of flat p late collectors, advanced collectors, op tical d esign of concentrators, selective coatings, solar w ater heating, solar dryers, solar stills, solar cooling and refrigeration. Thermal storage. Conversion of heat into mechanical energy. Active and p assive heating of bu ildings. Solar cells.

UNIT-III

WIND ENERGY: Wind as a Sou rce of Energy, Characteristics of w ind , w ind data. Horizontal & Vertical axis wind Mills, Wind Energy: Wind energy potential m easurement, general theories of wind machines, basic laws and concepts of aerodynamics, w ind mill and w ind electric generator. Basic electric generation schemes- constant speed constant frequency, variable speed constant frequency and variable speed variable frequency schemes. Applications of wind energy.

UNIT-IV

BIOMASS EN ERGY: Introdu ction to biomass, biofu els & their heat content, biomass conversion technologies. Aerobic & anaerobic digester, Factors affection biogestion, biogas plants - types & descrip tion. Utilisation of biogas - Gasifiers, d irect thermal application of Gasifiers. Ad vantages & p roblems in d evelopment of Gasifiers, u se in I.C. engines , Energy plantation. Pyrolysis scheme. Alternative liquid fuels –ethanol and methanol. Ethanol

production.

TEXT BOOKS:

Electric Power Generation, B.R.Gupta
Power Generation, Operation and Control, Wood and Wollenberg, John Wiley & Sons,1984.
Power Plant Engg: G.D. Rai

REFERENCE BOOKS:

Renewable Energy Resources: John Twidell and Tony Weir
Renewable Energy Resources Conventional & Non- Conventional: M.V.R Koteswara Rao
Science & Technology of Photovoltaics: Jayarama Reddy P.

Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.

BT401B BIOINFORMATICS

B. Tech. Semester – VII – Open Elective

L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
4	**-**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT-I

INTRODUCTION: Internet, intranet and extranet, netw orking, p rotocols, genom ic d ata, organization, representation, data base management systems.

SEQUEN CIN G D ATA BAN K: Introd u ction, collecting and storing sequ ence in laboratory, nu cleic acid d ata bank – Gen Bank, EMBL, AIDS and RN A, p rotein d ata bank (PDB), cam brid ge stru ctu ral d atabase CSD, genom e d ata bank, hybridoma data bank structure and others.

UNIT-II

SEQUEN CE AN ALYSIS: Analysis tools for sequ ence d ata banks, pair w ise alignment: N EEDLEMAN and WUNSCH algorithms, Smith Waterman, multiple alignment – CLUSTAL-W, BLAST, FASTA, sequence patterns and motifs and profiles.

PREDICTIONS: Second ary and tertiary stru ctu re: algorithm s Chao-Fasman algorithm , hid d en Markov m od el, neural networking, protein classification, fold libraries, fold recognition (threading), homology detection, SRS-access to biological data banks.

UNIT-III

PHYLOGEN ETIC AN ALYSIS– Basic concep ts in system atics, taxonom y and p hylogeny, p hylogenetic trees-variou s typ es and their constru ction, tree bu ild ing m ethods, d istance m ethod s, m u ltiple alignm ent character based method, phylogenetic software.

MAN AGIN G SCIEN TIFIC D ATA: Introd u ction, challenges faced in integration of biological information, SRS, Kleisli Qu ery System TAMBIS, P/ FDM m ed iator for a bioinform atics d atabase, fed eration, d iscovery link and d ata management.

UNIT-IV

GENOMICS & PROTEOMICS: Genome mapping, assembly and comparison, functional genomics: sequence based ap p roaches & m icroarray based ap p roaches, p roteom ics: technology of p rotein exp ression analylsis & posttranslational modifications, protein sorting, protein-protein interaction.

TEXT / REFERENCE BOOKS:

- Developing Bioinformatics Computer Skill, ed. Gibes & Jombeck, Shroff Publication
- Bioinformatics, ed. David W. Mount

TEXT / REFERENCE BOOKS

- Developing Bioinformatics Computer Skill, ed. Gibes & Jombeck, Shroff Publication
- Bioinformatics, ed. David W. Mount

Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.

AE 417B MODERN VEHICLE TECHNOLOGY

B. Tech. Semester – VII – Open Elective

L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
4	**-**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT I

TRENDS IN POWER PLANTS: Hybrid vehicles – stratified charged / lean burn engines – Hydrogen engines – battery vehicles – Electric propulsion with cables – magnetic track vehicles.

UNIT II

SUSPEN SION BRAKES AN D SAFETY: Air su sp ension – Closed loop su sp ension – antiskid braking system , Retarders, Regenerative braking safety cage – air bags – crash resistance – passenger comfort

UNIT III

N OISE & POLLUTION : Red u ction of noise – Internal & external p ollu tion control throu gh alternate fu els / power plants – Catalytic converters and filters for particulate emission.

UNIT IV

VEHICLE OPERATION AN D CON TROL: Com pu ter control for p ollu tion and noise control and for fu el p economy – Transd u cers and actu ators – Inform ation technology for receiving operation rop er inform ation and of the vehicle like optimum speed and direction.

VEHICLE AUTOMATED TRACKS: Prep aration and m aintenance of p rop er road netw ork – National highw ay netw ork w ith au tom ated road s and vehicles – Satellite control of vehicle op eration for safe and fast travel.

TEXT BOOKS

1. Heinz Heisler, "Advanced Vehicle Technology" - Arnold Publication.

REFERENCES

Beranek.L.L., Noise reduction, McGraw Hill Book Co., Inc., Newyork, 1993.

Bosch Hand Book, 3rd Edition, SAE, 1993.

Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.

CE 451B POLLUTION & CONTROL							
B. Tech. Semester – VII – Open Elective							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
4	**-**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT – I

WATER POLLUTION – Classification of w ater p ollu tants, w ater characteristics, efflu ent stand ard s, p rim ary treatm ent, second ary treatm ent – aerobic (activated slu d ge, aerated lagoons, trickling filter, roughing filter, rotating biological contactor) anaerobic (contact process, UASB).

UNIT – II

AIR POLLUTION : Classification of air p ollu tants, Particu lates: Physical characteristics, m od e of form ation, setting properties, Control measures.

HYDROCARBONS: N atu re; sou rces, control, Carbon Monoxid e: Sou rce, harmfu l effects on hu m an health, control m easu res. Oxid es of Su lp hu r and N itrogen Sou rces, effects on hu m an health and p lants. Control measure.

UNIT – III

SOLID WASTE: Typ es, sou rces and p rop erties of solid w aste, m ethod s of solid w aste treatm ent and disposal

SOLID WASTE MAN AGEMEN T – Generation, Collection and techniqu es for u ltim ate d isp osal, Elementary discussion on resource and energy recovery.

UNIT – IV

Elementary treatment of nuclear pollution, metal pollution, noise pollution their effects & control.

Trace elem ent: Mechanism of d istribu tion, essential and non essential elem ents, trace of elem ent in m arin environment, its ecological effects and biological effects.

Suggested Books:

Environmental Engg.: by Howard s. Peavy & Others, MGH International.

Metacaf – EDDY – Waste-water engineering revised by George Teholonobus (TMH)

Environmental Chemistry by B.K. Sharma, Goel Publishing, Meerut.

Environmental Chemistry, A.K.DE, Wiley Eastern.

Air Pollution: H.C. Perking – Mc Graw Hill.

Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.

CSE 411B MANAGEMENT INFORMATION SYSTEM

B. Tech. Semester – VII – Open Elective

L	T	P	Credits		Class Work	:	25 Marks
4	-	--	4		Examination	:	75 Marks
					Total	:	100 Marks
					Duration of Examination	:	3 Hours

UNIT I

FOUNDATIONS:-

IN FORMATION SYSTEM: Introd u ction to Inform ation System and MIS, Decision su p port and d ecision m aking system s, system s ap p roach, the system s view of bu siness, Managing the d igital firm , Electronic Commerce and Electronic business, DBMS, RDBMS , introduction to Telecommunication and Networks

I.T.INFRASTRUCTURE:- Managing H ard w are Assets, Managing Softw are Assets, Managing Data Resources. Internet And New It Infrastructure .

UNIT II

CONCEPTUAL SYSTEM DESIGN: Define the problems, set systems objective, establish system constraints, determine information needs determine information sources, develop alternative conceptual design and select one d ocu m ent the system concep t, and p rep are the concep tu al d esign rep ort. Inform ation System s Secu rity and Control, Ethical and Social Impact of Information Systems.

UNIT III

D ETAILED SYSTEM D ESIGN : Inform and involve the organization, aim of d etailed d esign, p roject m anagem ent of MIS d etailed d esign , id entify d om inant and trad e of criteria, d efine the su b system s, sketch the d etailed op erating su b system s and information flow , d eterm ine the d egree of au tom ation of each op eration, inform and involve the organization again, inpu ts ou tp u ts and p rocessing, early system testing, softw are, hard w are and tools p rop ose an organization to op erate the system , d ocu m entation of d etailed design

UNIT IV

IMPLEMEN TATION , EVALUATION AN D MAIN TEN AN CE OF THE MIS: Plan the im p lem entation, acqu ire floor sp ace and p lan space layou ts, organize for im p lem entation, d evelop p roced u res for im p lem entation, train the op erating personnel, com p u ter related acqu isitions, d evelop form s for d ata collection and inform ation d issem ination, d evelop the files test the system , cu t-over, d ocu m ent the system , evalu ate the MIS control and m aintain the system . Pitfalls in MIS d evelopment, Red esigning the organization with Information systems, Managing Knowledge Work.

TEXT BOOKS:

1. Management Information System by W. S. Jawadekar, 2002, Tata McGraw Hill.

2. Managem ent Inform ation System by K.C. Lau d on & J.P. Lau d on 7th Ed ition 2003 Pearson Ed u cation Publishers Indian Reprint.

3. Inform ation System for Mod ern Managem ent (3rd edition)- Robert G. Mu rd ick, Loel E. Ross & Jam es R. Claggett. PHI

REFERENCE BOOKS:

1. Management Information System; O Brian; TMH

2. Management Information System by Davis Olson Mac Graw Hill
3. Management Information System by Stallings,(Maxwell Mc Millman Publishers)

Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.

IT413**BCYBER SECURITY**							
B. Tech. Semester – VII – Open Elective							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
4	**-**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT I

IN TROD UCTION TO CYBERCRIME: Cybercrim e and Information Secu rity, Classifications of Cybercrim es, The need for Cyberlaw s, The Ind ian IT Act Challenges to Ind ian Law and Cybercrim e Scenario in Ind ia, Weakness in Inform ation Technology Act and it consequ ences, Digital Signatu res and the Ind ian IT Act, Cybercrim e and Pu nishm ent; Technology, Stu d ents and Cyberlaw ; Su rvival tactics for the N etizens, Cyber-offenses: Cyberstalking, Cybercafe and Cybercrimes, Botnets, Attack Vector, Cloud Computing;

UNIT II

TOOLS AN D METHOD S USED IN CYBERCRIME: Proxy Servers and Anonym izers, Phishing and id entity theft, Passw ord Cracking, Keyloggers and Sp yw ares, Viru s and Worm s, Trojan H orses and Backd oors, Steganography, DoS and DDoS Attacks, SQL Injection, Bu ffer Overflow ; Cybercrim e: Mobile and Wireless Devices: Trends in Mobility, Attacks on Wireless N etw orks, Cred it Card Frau d s in Mobile and Wireless Com p u ting Era, Secu rity Challenges, Registry Settings for Mobile Devices, Au thentication Service Secu rity, Attacks on Mobile/Cell Phones.

UNIT III

UN D ERSTAN D IN G COMPUTER FOREN SICS: The N eed for Com p u ter Forensics, Cyberforensics and Digital Evid ence, Forensics Analysis of E-Mail, Digital Forensics Life Cycle, Chain of Cu stod y Concep t, N etw ork Forensics, Com p u ter Forensics and Steganograp hy, Relevance of the OSI 7 Layer Mod el to

Com p u ter Forensics, Forensics and Social N etw orking Sites: The Secu rity/ Privacy Threats, Challenges in Computer Forensics, Forensics Auditing, Antiforensics.

UNIT IV

CYBERSECURITY: ORGAN IZATION AL IMPLICATION S: Cost of Cybercrim es and IPR Issu es, Web Threats for Organizations, Secu rity and Privacy Im p lications from Clou d Com p u ting, Social Med ia Marketing, Social Computing and the Associated Challenges for Organizations, Protecting People's Privacy in the Organization, Organizational Gu id elines for Internet Usage, Safe Com p u ting Gu id elines and Com pu ter Usage Policy, Incid ent H and ling, Forensics Best Practices, Med ia and Asset Protection, Im p ortance of Endpoint Security in Organizations.

TEXT BOOKS:

- "Cyber Secu rity Und erstand ing Cyber Crim es, Com pu ter Forensics and Legal Persp ectives", N ina God bole, Sunit Belapur, Wiley India Publications, April, 2011

Note:

In the sem ester examination, the exam iner w ill set tw o qu estions from each u nit (total 08 qu estions in all), covering the entire syllabu s. The stu d ents w ill be requ ired to attem p t only 5 qu estions selecting at least one question from each unit.

The u se of scientific calcu lator w ill be allow ed in the exam ination . H ow ever, p rogram mable calcu lator and cellular phone will not be allowed.

ME 409B AUTOMOBILE ENGG. LAB							
B. Tech. Semester – VII (Mechanical Engineering)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**20 Marks**
--	**--**	**2**	**1**		**Examination**	**:**	**30 Marks**
					Total	**:**	**50 Marks**
					Duration of Examination	**:**	**3 Hours**

LIST OF EXPERIMENTS:

To stu d y and p rep are rep ort on the constru ctional d etails, w orking p rincip les and op eration of the follow ing Automotive Engine Systems & Sub Systems.

(a) Multi-cylinder: Diesel and Petrol Engines. (b) Engine cooling & lubricating Systems.

© Engine starting Systems. (d) Contact Point & Electronic Ignition Systems.

To stu d y and p rep are rep ort on the constru ctional d etails, w orking p rincip les and op eration of the follow ing Fuel supply systems:

(a) Carburetors (b) Diesel Fuel Injection Systems (c) Gasoline Fuel Injection Systems.

To stu d y and p rep are rep ort on the constru ctional d etails, w orking p rincip les and op eration of the follow ing Automotive Clutches.

(a) Coil-Spring Clutch (b) Diaphragm – Spring Clutch. (c) Double Disk Clutch.

To stu d y and p rep are rep ort on the constru ctional d etails, w orking p rincip les and operation of the following Automotive Transmission systems.

(a) Synchromesh – Four speed Range. (b) Transaxle with Dual Speed Range.

© Four Wheel Drive and Transfer Case. (d) Steering Column and Floor – Shift levers.

To stu d y and p rep are rep ort on the constru ctional d etails, w orking p rincip les and op eration of the follow ing Automotive Drive Lines & Differentials.

(a) Rear Wheel Drive Line. (b) Front Wheel Drive Line. (c) Differentials, Drive Axles and 4 Wheel Drive Line.

To stu d y and p rep are rep ort on the constru ctional d etails, w orking p rincip les and op eration of the follow ing Automotive Suspension Systems.

(a) Front Suspension System. (b) Rear Suspension System.

To stu d y and p rep are rep ort on the constru ctional d etails, w orking p rincip les and op eration of the follow ing Automotive Steering Systems.

(a) Manu al Steering System s, e.g. Pitm an –arm steering, Rack & Pinion steering. (b) Pow er steering Systems, e.g. Rack and Pinion Power Steering System. (c) Steering Wheels and Colu m ns e.g. Tilt & Telescop ic steering Wheels, Collapsible Steering Columns.

To stu d y and p rep are rep ort on the constru ctional d etails, w orking p rincip les and op eration of the follow ing Automotive Tyres & wheels.

(a) Various Types of Bias & Radial Tyres (b) Various Types of wheels.

To stu d y & p rep are report on constru ctional d etails, w orking p rinciples and op eration of Automotive Brake systems.

(a) Hydraulic & Pneumatic Brake systems. (c) Drum Brake System. (e) Disk Brake System.

(b) Antilock Brake System. (d) System Packing & Other Brakes.

To stu d y and p rep are report on the constru ctional d etails, w orking p rinciples and op eration of Automotive Emission / Pollution control systems.

Mod eling of any tw o au tom otive system s on 3D CAD u sing ed u cational softw ares (eg. 3D modeling package/Pro Engineer/I-Deas/ Solid Edge etc.)

Crash worthiness of the designed frame using Hypermesh and LS-Dyna solver or other software.

Note: 1. Ten experiments are to be performed in the Semester.

At least eight exp erim ents shou ld be p erform ed from the above list. Remaining tw o exp erim ents m ay either be p erform ed from the above list or d esigned & set by the concerned institute as per the scope of the syllabus.

ME 411B REFERIGERATION & AIR CONDITIONING.LAB

B. Tech. Semester – VII (Mechanical & Aeronautical Engineering)

L	T	P	Credits				
--	--	2	1		Class Work	:	20 Marks
					Examination	:	30 Marks
					Total	:	50 Marks
					Duration of Examination	:	3 Hours

LIST OF EXPERIMENTS:

To stu d y the Vap or Com p ression Refrigeration (VCR) System and d eterm ine its C.O.P. Draw the cycle on P-H and T-S diagrams.

To Study the Mechanical heat pump and find its C.O.P.

To stu d y the cu t- sectional m od els of Recip rocating, Rotary and Screw typ e refrigerant compressors.

To study the various controls used in Refrigerating & Air Conditioning systems.

To study the Ice- plant, its working cycle and determine its C.O.P and capacity.

To stu d y the m ixing p rocess for d ifferent inlet cond itions and p lot them on Psychrom etric charts and u nd erstand the concep t of recircu lation of air on re-circu lated air-cond itioning set up.

To stu d y the basic air cond itioning p rocesses like heating, cooling, hu m id ification, cooling and dehumidification and plot them on Psychrometric chart.

To d eterm ine the By-p ass factor of cooling coil and p lot them on Psychrom etric charts for different inlet conditions.

To study the chilling plant and its working cycle.

To study the aqua- ammonia absorption system and find its COP.

Note: 1. Ten experiments are to be performed in the Semester.

At least eight exp erim ents shou ld be p erform ed from the above list. Remaining tw o exp erim ents m ay either be p erform ed from the above list or d esigned & set by the concerned institute as per the scope of the syllabus.

ME 413B PROJECT							
B. Tech. Semester – VII (Mechanical Engineering)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**100 Marks**
--	--	4	4				

The primary objective of this course is to develop in students the professional quality of synthesis employing technical knowledge obtained in the field of Engineering & Technology through a project work involving design, analysis augmented with creativity, innovation and ingenuity.

Project involving design/ fabrication/ testing/ computer simulation/ case studies etc. which commences in the VII Semester will be completed in VIII Semester and will be evaluated through a panel of examiners consisting of the following:

Chairman of Department : Chairperson

Project coordinator : Member Secretary

Respective project supervisor : Member

The student will be required to submit two copies of his/her project report to the department for record (one copy each for the department and participating teacher).

Project coordinator will be assigned the project load of maximum of 2 hrs. per week including his own guiding load of one hr. However, the guiding teacher will be assigned maximum of one period of teaching load irrespective of number of students/groups under him/her.

The format of the cover page and the organization of the body of the report for all the B.Tech. will be finalized and circulated by the Dean, Faculty of Engineering and Technology.

ME 415B PROFESSIONAL TRAINING II							
B. Tech. Semester – VII (Mechanical Engineering)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**50 Marks**
--	--	2	2		**Total**	**:**	**50 Marks**

- At the end of 6th semester each student would undergo four weeks Professional Training in an Industry/ Institute/ Professional / Organization/ Research Laboratory etc. with the prior approval of the Training and Placement Officer of the University and submit in the department a typed report along with a certificate from the organization.
- The typed report should be in a prescribed format.
- The report will be evaluated in the VII Semester by a Committee consisting of three teachers from different specialization to be constituted by the Chairperson of the department. The basis

of evalu ation w ill p rim arily be the know led ge and exp osu re of the stu d ent tow ard s d ifferent processes and the functioning of the organization.

- The stu d ent w ill interact w ith the com m ittee throu gh p resentation to d em onstrate his/ her learning.

Teachers associated with evaluation work will be assigned 2 periods per week load.