SCHEME OF STUDIES & EXAMINATIONS B.Tech. 2nd YEAR (SEMESTER – IV) MECHANICAL ENGINEERING Credit Based Scheme w.e.f. 2013-14

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	MGT 201 B GES 201 B	ENGINEERING ECONOMICS **(Common for all branches Except BT & BME) (Gr- B)** **OR** ENVIRONMENTAL STUDIES **(Common for all branches) (Gr-A)**	4 3	- -		25 -	75 75*	-	100 75*	4 --	3
2	ME 202B	MANUFACTURING TECHNOLOGY	3	1		25	75	-	100	4	3
3	ME 204B	MATERIAL SCIENCE	3	1		25	75	-	100	4	3
4	ME 206B	STRENGTH OF MATERIALS –II	3	1		25	75	-	100	4	3
5	ME 208B	FLUID MACHINES	3	1		25	75	-	100	4	3
6	ME 210B	ENERGY CONVERSION	3	1		25	75	-	100	4	3
7	ME 212B	MATERIAL SCIENCE LAB	-	-	2	20	-	30	50	1	3
8	ME 214B	FLUID MACHINES LAB	-	-	2	20	-	30	50	1	3
9	ME 216B	ENERGY CONVERSION LAB	-	-	2	20	-	30	50	1	3
10	ME 218B	MANUFACTURING PRACTICE (ME, AER)	-	-	3	20	-	30	50	1.5	3
11	GES 203 B	ENVIRONMENTAL STUDIES FIELD WORK **(Common for all branches) (Gr-A)**	-	-	-	-	-	25*	25*	-	
12	GPME 202B	GENERAL PROFICIENCY & ETHICS	1	-	-	-	-	75	75	2	3
		Total Gr-B	**20**	**5**	**9**	**230**	**450**	**195**	**875**	**30.5**	
		Gr-A	**19**	**5**	**9**	**205**	**375**	**195**	**775**	**26.5**	

Note:

5888 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 & Ethics Syllabus.

5889 *The Environmental studies (GES-201 B & Environment Studies Field work (GES-203B) are compulsory & qualifying courses only.

5890 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.

5891 Electronics gadgets including Cellular phones are not allowed in the examination

5892 Each stu d ents has to u nd ergo Professional Training of at least 4 w eeks from the ind u stry, institu te, research lab, training center etc d u ring su m m er vacation and its evalu ation shall be carries ou t in the V semester

5893 All the branches are to be divided into group ‘A’ and ‘B’ as per the suitability of the institute/college, so that there is an equitable distribution of teaching load in odd and even semesters.

ME202B MANUFACTURING TECHNOLOGY

B. Tech. Semester – IV (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 FOUN D RY - Step s involved in casting, ad vantages, lim itations and ap p lications of casting p rocess, m old ing m ethod s, m old ing m aterials and p rop erties, Design consid erations in casting, gating system design and Riser design, directional solidification in castings, problems.

MELTING, CLEAN IN G AN D TESTING OF CASTIN G PROCESS- Melting p ractice: Cu p ola, charge calcu lations, cleaning of casting, Fettling, d efects in castings and their rem ed ies, m ethod s of testing of castings for their soundness, problems.

SPECIAL CASTIN G PROCESSES: Shell m old ing, p recision investm ent casting, p erm anent m old casting, d ie casting, centrifugal casting, and continuous casting.

UNIT II

THEORY OF METAL FORMIN G -Classification of m etal form ing p rocesses, N atu re of p lastic d eform ation, hot w orking and cold w orking, yield criteria and their significance, Princip les of rolling roll passes roll pass sequ ences. Forging: p rocess and d efects, Extru sion and other p rocesses: Extru sion p rincip le, w ire d raw ing, sw aging, tu be making.

POWD ER METALLURGY- Introd u ction ,Prod u ction of Metallic Pow d er, Processing m ethod s, Design consideration for powder metallurgy.

UNIT III

IN TROD UCTION TO WELD IN G-Classification of w eld ing p rocess, Selection of a w eld ing p rocess, Effect of w eld ing p aram eters, Selection of electrod es and flu xes, Metal transfer & its im p ortance in arc w eld ing, Power sources for arc welding, Inspections and defects of weldments, Gas welding, Arc welding, Resistance welding

OTHER WELD IN G PROCESSES: Introd u ction of therm it w eld ing, electro slag w eld ing, electron beam w eld ing, forge welding, friction welding, diffusion welding, brazing and soldering.

UNIT IV

SHEET METAL FORMING PROCESSES- Classification of sheet metal processes, press tool operations, shearing action, Principle, process parameters, equipment and application of the following processes, piercing, blanking, deep drawing, spinning, stretch forming, embossing and coining, sheet metal die design, problems.

PLASTIC PROCESSING- Introduction, plastic materials, extrusion of plastic, injection moulding, blow moulding**.**

Text Books:

Principles of Manufacturing Materials & Processes – Campbell J. S., Publisher – Mc Graw Hill.

. Manufacturing Technology-Foundry, Forming and Welding - P.N. Rao, Tata McGraw Hill

Reference Books:

Foundry Technology - K.P. Sinha, D.B. Goel, Roorkee Publishing House.

Welding and Welding Technology, Richard L. Little Tata McGraw Hill Ltd.

3. Principle of Metal casting - Rosenthal, Tata McGraw Hill, New Delhi

Manufacturing Processes and Systems: Ostwald Phillip F., Munoz Jairo, John Wiley & Sons

Elements of Manufacturing Processes – B.S. Nagendra Parasher, RK Mittal, PHI N. 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 204 MATERIAL SCIENCE							
B. Tech. Semester – IV (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

ENGINEERING MATERIAL AND CRYSTALLOGRAPHY

Engineering Materials: Classification of engineering materials, Property spectrum of engineering materials

Crystal Geometry:space lattice,unit cell, Bravais crystal system, atomic packing fraction, Miller indices, interplaner spacing, linear density, planer density, Numerical problems

Crystal Imperfcections: Classification of Imperfections, line imperfection ,Mixed dislocations, Characteristics of dislocation ,sources of dislocation, their effects and remedies, phenomenon related to behaviour of dislocations, surface imperfection, volume imperfection, whiskers.

UNIT II

PHASES DIAGRAMS AND HEAT TREATMENT

Solid solution, types of solid solution, phases, Gibb's Phase rule, Phase diagrams, unary and binary phase diagrams, eutectic and eutectoid phase diagrams, peritectic and peritectoid phase diagrams, microstructu ral changes, lever rule, Iron carbon system

PHASE TRANSFORMATIONS: terminology, Strengthening mechanism, cold and hot working, precipitation hardening, dispersion hardening, solid solution hardening, Recovery, re-crystallization and grain growth.

Diffusion process, types of diffusion, laws of diffusion- Fick's first law and Fick's second law of diffusion.

HEAT TREATMENT: purpose of heat treatment, microstructure of steel and iron, Transformation in Steel and Critical cooling curve, Hardening, annealing, normalizing, stress relieving, tempering, carburizing, nitriding, cyaniding, flame and induction hardening.

UNIT III

MATERIAL DEFORMATION AND FAILURE

Inelastic deformation, slip systems, critical resolved shear stress (crss) yielding, strain hardening, bauschinger effect, frank read source, Anelastic behaviour, Viscoelastic behaviour

FRACTURE: Ductile fracture, brittle fracture, Griffith theory of crack propagation, cleavage fracture, method of protection against fracture ,Ductile to brittle transition

CORROSION AND OXIDATION: Corrosion, types of corrosion, laws of corrosion ,oxidation and its mechanism, passivity, special type of corrosion, protection against corrosion and oxidation.

Fatigue, mechanism of fatigue, improving fatigue life, Creep, factor affecting creep, mechanism of creep, creep resistant materials

UNIT IV

STEEL ALLOYS AND COMPOSITES

Plain carbon steel, cast iron, effects of alloying elements on steel, effects on alloying elements on non-ferrous metals, ferrous alloys, non ferrous alloys, alloys in different applications, materials for special cases.

Composite materials: introduction, laminates, reinforced composite materials and their classification ,particulate composites, flake composites, whisker reinforced composites, hybrid composites, sandwitch composites, fibre-reinforced glass and glass ceramic composites, MMC and wood composite, advantages and limitatation of composites, Application of composites materials

Text Books:

Material Science, Metallurgy & Engineering materials-K.M.GUPTA, Umesh Publications

Material Science and Engineering-An Introduction - Callister; W.D., John Wiley & Sons., Delhi

REFERENCE BOOKS:

Material Science & Engineering –V. Raghvan, Prentice Hall of India Pvt. Ltd, New Delhi

Elements of Material Science and Engineering: VanVlack, Wesley Pub. Comp

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 206B STRENGTH OF MATERIALS- II							
B. Tech. Semester – IV (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

THIN WALLED VESSELS: H oop & Longitu d inal stresses & strains in cylind rical & sp herical vessels & their derivations under internal pressure, volumetric strain, Numericals.

THICK CYLINDERS & SPHERES: Derivation of Lame's equations, radial & hoop stresses and strains in thick and compound cylinders and spherical shells subjected to internal fluid pressure only, Numericals.

UNIT II

STRAIN ENERGY : Definitions, expressions for strain energy stored in a body when load is gradually, suddenly and with impact, strain energy of beams due to: bending, pure shear, Horizontal shear and torsion, beam deflections, Castigliano's theorems, Numericals.

THEORIES OF ELASTIC FAILURE: Variou s theories of elastic failu res w ith d erivations and grap hical rep resentations, ap plications to p roblem s of 2-d imensional stress system w ith com bined d irect load ing and bending, and combined torsional and direct loading, Numericals.

UNIT III

STRESSES D UE TO ROTATION : Stresses in Rotating Ring, and Disc, hollow d isc and solid s d isc, Stresses in rotating cylinders, hollow cylinders & solids cylinder, rotating discs of uniform strength, Numericals.

UNSYMMETRICAL BENDING: Properties of beam cross section, product of inertia, ellipse of inertia, slope of the neu tral axis, stresses & d eflections, shear center and the flexu ral axis for I-section and channel section, Numericals

UNIT IV

CURVED BEAMS: Stresses in beam of initial large rad iu s of cu rvatu re, p osition of neu tral axis for rectangu lar, circu lar and trap ezoid al sections, stresses in crane hooks, stresses in circu lar rings su bjected to tension or compression, Numericals.

SPRINGS: Stresses in op en coiled helical sp ring su bjected to axial load s, axial cou p les and com bined action of axial load s and axial cou p les, leaf sp rings, and flat sp iral sp rings, energy m ethod s in d eterm ining sp ring deflection Numericals

Text Books:

Strength of Materials – G.H.Ryder, Macmillan, India.
Mechanics of Materials – (Metric Ed ition): Ferd inand P. Beer and E. Ru ssel Johnston, Jr. Second Edition, McGraw Hill.

Reference Books :

Book of Solid Mechanics – Kazmi, Tata Mc Graw Hill
Strength of Materials – Sadhu Singh - Khanna Publication

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 208B FLUID MACHINES							
B. Tech. Semester – IV (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

IMPACT OF FREE JETS: Im p u lse – m om entu m p rincip le, jet imp ingem ent - on a stationary flat p late, inclined p late and a hinged p late, at the center of a stationary vane, on a m oving flat p late, inclined p late, a m oving vane and a series of vanes, Jet striking tangentially at the tip of a stationary vane and m oving vane(s), jet p rop u lsion of ships. Problems

IMPULSE TURBIN ES: Classification – im p u lse and reaction tu rbines, w ater w heels, com p onent p arts, constru ction, op eration and governing m echanism of a Pelton w heel, w ork d one, effective head , available head and efficiency of a Pelton w heel, d esign asp ects, sp eed ratio, flow ratio, jet ratio, nu m ber of jets, nu m ber of bu ckets and working proportions, Performance Characteristics, governing of impulse turbines. Problems

UNIT II

FRAN CIS TURBIN ES: Com p onent p arts, constru ction and op eration of a Francis tu rbine, governing mechanism , w ork d one by the tu rbine ru nner, w orking p rop ortions and d esign p aram eters, slow , m ed iu m and fast ru nners, degree of reaction, inward/outward flow reaction turbines, Performance Characteristics, Problems.

PROPELLER AN D KAPLAN TURBIN ES: Com p onent p arts, constru ction and op eration of a Prop eller, Kaplan tu rbine, d ifferences betw een the Francis and Kaplan tu rbines, d raft tu be - its fu nction and d ifferent form s, Performance Characteristics, Governing of reaction tu rbine, Introd u ction to new typ es of tu rbine, Deriaz (Diagonal), Bulb, Tubular turbines, Problems.

UNIT III

D IMEN SION AL AN ALYSIS AN D MOD EL SIMILITUD E: Dim ensional hom ogeneity, Rayleigh's m ethod and Bu ckingham 's p -theorem, m od el stu d ies and similitu d e, d im ensionless nu m bers and their significance. Unit qu antities, specific sp eed and m od el relationship s for tu rbines, scale effect, cavitations – its cau ses, harm fu l effects and prevention, Thomas cavitation factor, permissible installation height, Problems.

HYD RAULIC SYSTEMS: Fu nction, constru ction and op eration of H yd rau lic accu mu lator, hyd rau lic intensifier, hydraulic crane, hydraulic lift and hydraulic press, Fluid coupling and torque converter, Hydraulic ram, Problems

UNIT IV

CEN TRIFUGAL PUMPS: Classification, velocity vector d iagram s and w ork d one, m anom etric efficiency, vane shap e, head cap acity relationship and p u m p losses, p ressu re rise in im p eller, m inim u m starting sp eed , d esign considerations, multi-stage p u m p s. Sim ilarity relations and sp ecific sp eed , net p ositive su ction head , cavitation and m axim u m su ction lift, p erform ance characteristics. Brief introd u ction to axial flow , mixed flow and su bm ersible pumps, Problems.

RECIPROCATIN G PUMPS: Constru ction and op erational d etails, d ischarge coefficient, volu m etric efficiency and slip, w ork and p ow er inpu t, effect of acceleration and friction on ind icator d iagram (p ressu re – stroke length p lot),

separation, air vessels and their utility, rate of flow into or from the air vessel, maximum speed of the rotating crank, characteristic cu rves, centrifu gal vs recip rocating pu m p s, brief introd u ction to screw , gear, vane and rad ial p iston pumps, Problems.

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TEXT BOOKS:

Hydraulics & Fluid Mechanics – Modi & Seth, Pub. - Standard Book House, N.Delhi
Hydraulic Machines – Jagdish Lal, Metropolitan

REFERENCE BOOKS:

Fluid Mechanics and Hydraulic Machines – S S Rattan, Khanna Publishers
Introduction to Fluid Mechanics and Fluid Machines – S K Som and G Biswas, Tata McGraw Hill
Fluid Mechanics and Fluid Power Engineering – D S Kumar, S K Kataria and Sons

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 – 210B ENERGY CONVERSION							
B. Tech. Semester – IV (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

FUELS AN D COMBUSTION: Classification of fu els- solid , liqu id & gaseou s fu els, Com bu stion equ ations, Stochiom etric air-fu el ratio, Excess air, Orsat ap paratu s for exhau st & flu e gas. Enthalp y and internal energy of combustion, Enthalpy of formation, Adiabatic flame temperature, Calorific values of fuel, Problems.

STEAM BOILERS AN D D RAFT: Classification, com p arison betw een fire and w ater tu be boilers, Essentials of a good boiler, Constru ctional and op erational d etails of Locom otive & Lancashire Boilers, H igh p ressu re boilers-Benson, Lamont, Loeffler and Velox boilers, Boiler m ou ntings and accessories, Boiler p erform ance, N atu ral& Artificial drafts, Chimney height, Maximum draft and chimney efficiency, Boiler heat balance sheet, Problems.

UNIT II

VAPOUR POWER CYCLES: Carnot and Rankine vap ou r cycles, effect of op erating cond itions on efficiency of Rankine cycle, Rankine cycle with superheat, reheat and regeneration, Binary vapour cycle, Problems.

FLOW THROUGH NOZZLES: Velocity and heat drop, mass discharge through a nozzle, critical pressure ratio and its significance, effect of friction and nozzle efficiency, su p ersatu rated flow , relationship betw een area, velocity & pressure in nozzle flow, Problems.

UNIT III

STEAM TURBIN ES: Classification, Im p u lse Tu rbine- Flow throu gh blad es, velocity d iagram , p ow er ou tp u t and efficiency, maximu m blad e efficiency of single stage im p u lse tu rbine, blad e friction, com p ou nd ing of im p u lse turbine. Reaction Turbine-Flow through blades, degree of reaction, velocity diagram, power output, blade efficiency and blad e height, com p arison of im pu lse and im p u lse reaction tu rbines. Energy losses in steam tu rbines, stage efficiency, overall efficiency and reheat factor, cond ition for m axim u m blad e efficiency for im p u lse and reaction turbine, governing of steam turbines, Problems.

UNIT IV

STEAM CON D EN SERS: Elements of a cond ensing p lant, typ es of cond ensers, com parison of jet and su rface cond ensers. Cond enser vacu u m , sou rces of air leakage & its d isad vantages, vacu u m efficiency and cond enser efficiency, d eterm ination of m ass of cooling w ater for jet and su rface cond ensers, cooling p ond s and cooling tow ers, Problems.

AIR COMPRESSORS: Working of a single stage recip rocating air com p ressor; calcu lation of w ork inp u t w ith and w ithou t clearance; Volu metric efficiency; Isotherm al efficiency; Ad vantages of m u lti stage com p ression; Multi - stage compressor with Inter-cooling; Perfect Inter cooling; Optimum intercooler pressure, Problems.

TEXT BOOKS:

Engineering Thermodynamics – P K Nag Tata Mc Graw Hill

2.Thermal Science & Engineering – D S Kumar, S K Kataria & Sons

REFERENCE BOOKS:

Applied Thermodynamics for Engineering Technologists – T D Eastop and A McConkey, Pearson Education
Thermal Engineering – A S Sarao, Satya Prakashan
Thermodynamics and Heat Engines vol. II – R Yadav, Central Publishing House

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 212B MATERIAL SCIENCE LAB

B. Tech. Semester – IV (Mechanical Engineering)

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

LIST OF EXPERIMENTS:

To study crystal structures with the help of ball model.

To study crystal structures and crystals imperfections using ball models.

To study microstructures of metals/ alloys through microscopic observation.

To study hardening (by quenching) of steel specimen by Jominy Test.

To observe effect of tempering temperature on the property of given steel specimen.

To study microstructure of heat-treated steel through microscopic observation.

To study thermo-setting of plastics.

To study the creep behavior of a given specimen.

To study the mechanism of chemical corrosion and its protection.

To study the properties of various types of plastics.

To study Bravais lattices with the help of models.

Note:

At least ten experiments are to be performed in the semester.

At least eight experiments should be performed from the above list. Remaining tw o experiments may either be performed from the above list or designed & set by the department as per the scope of the syllabus.

ME 214B FLUID MACHINES LAB							
B. Tech. Semester – IV (Mechanical Engineering)							
L	T	P	Credit		Class Work	:	20 Marks
--	--	2	1		Examination	:	30 Marks
					Total	:	50 Marks
					Duration of Examination	:	3 Hours

LIST OF EXPERIMENTS:

To study the constructional details of a Pelton turbine and draw its fluid flow circuit.

To d raw the follow ing p erform ance characteristics of Pelton tu rbine-constant head , constant-speed and constant efficiency curves.

To study the constructional details of a Francis turbine and draw its fluid flow circuit.

To d raw the constant head , constant sp eed and constant efficiency p erform ance characteristics of Francis turbine.

To study the construction details of a Kaplan turbine and draw its fluid flow circuit.

To draw the constant head, speed and efficiency curves for a Kaplan turbine.

To stu d y the constru ctional d etails of a Centrifu gal Pu m p and d raw its characteristic curves.

0 To stu d y the constru ctional d etails of a Recip rocating Pu m p and d raw its characteristics curves.

To study the construction details of a Gear oil pump and its performance curves.

To stu d y the constru ctional d etails of a H yd rau lic Ram and d eterm ine its variou s efficiencies..

11. To study the model of Hydro power plant and draw its layout.

Note:

0 At least ten experiments are to be performed in the semester.

At least eight experiments should be performed from the above list. Remaining tw o experiments may either be performed from the above list or designed & set by the department as per the scope of the syllabus (ME208B).

ME 216B ENERGY CONVERSION LAB							
B. Tech. Semester – IV (Mechanical Engineering)							
L	**T**	**P**	**Credit**		**Class Work**	**:**	**20 Marks**
--	**--**	**2**	**1**		**Examination**	**:**	**30 Marks**
					Total	**:**	**50 Marks**
					Duration of Examination	**:**	**3 Hours**

LIST OF EXPERIMENTS:

To study low pressure boilers and their accessories and mountings.

To study high pressure boilers and their accessories and mountings.

To prepare heat balance sheet for given boiler.

To study the working of impulse and reaction steam turbines..

To find dryness fraction of steam by separating and throttling calorimeter.

To find power out put & efficiency of a steam turbine.

To find the condenser efficiencies.

To study and find volumetric efficiency of a reciprocating air compressor.

To study cooling tower and find its efficiency.

To find calorific value of a sample of fuel using Bomb calorimeter.

Calibration of Thermometers and pressure gauges.

Note:

At least ten experiments are to be performed in the semester.

At least eight experiments should be performed from the above list. Remaining tw o experiments may either be performed from the above list or designed & set by the department as per the scope of the syllabus.

ME 218B MANUFACTURING PRACTICE							
B. Tech. Semester – IV (Mechanical & Aeronautical Engineering)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**20 Marks**
--	**--**	**3**	**1.5**		**Examination**	**:**	**30 Marks**
					Total	**:**	**50 Marks**
					Duration of Examination	**:**	**3 Hours**

LIST OF EXPERIMENTS:

To m ake a pattern for a given casting w ith all the necessary allow ances, p arting line, ru nning system d etails. Prepare the mold and make the casting. Investigate the casting defects and suggest the remedial measures.

To m ake a com p onent involving horizontal and vertical position w eld ing and stu d y the w eld ing d efects and suggests their remedies.

To p rep are a job on su rface grind er/ cylind rical grind er and m easu re the variou s param eters of the finished piece.

To cut external threads on a lathe.

5. Manu factu re and assem bly of a u nit consisting of 2 to 3 com p onents to have the concep t of tolerances and fits (shaft and bush assembly or shaft, key and bush assembly or any suitable assembly).

Leveling of machine tools and testing their accuracy.

Disassembly and assembly of small assemblies such as tail stock, bench vice, screw jack etc.

Development and manufacture of complex sheet-metal components such as funnel etc.

Multi slot cutting on milling machine by indexing.

Drilling and boring of a bush.

Modeling of 3D runner system and creation of drawing for manufacturing of the casting patterns.

Develop m ent of blank size for com p lex sheet m etal com p onents u sing drawing softw are and com p are resu lts with manual calculation method.

Note:

At least ten experiments are to be performed in the semester.

At least eight experiments should be performed from the above list. Remaining tw o experiments may either be performed from the above list or designed & set by the department as per the scope of the syllabus (ME 202B).

GPME 202B GENERAL PROFICIENCY & ETHICS							
B. Tech. Semester – IV (Mechanical Engineering)							
L	**T**	**P**	**Credits**		**Examination**	**:**	**75Marks**

1	**--**	**--**	**2**	**Total**	**:**	**75 Marks**

The p u rp ose of this cou rse is to incu lcate a sense of p rofessionalism in a stu d ent along w ith p ersonality d evelop m ent in term s of qu ality su ch as receiving, resp ond ing, tem p eram ent, attitu d e and ou tlook. The stu d ent efforts will be evaluated on the basis of his/ her performance / achievements in different walks of life.

Facu lty Cou nselor w ill be attached to a grou p of stu d ents w hich w ill remain associated w ith him / her d u ring the entire p eriod of the d egree p rogram in the University. Each facu lty m em ber w ill serve as a facu lty cou nselor. They w ill act like a local gu ard ian for the stu d ents associated w ith him / her and w ill help them in term s of career guidance, personal difficulties.

The student will present a written report before the committee with following in view:

The stu d ent w ill p resent before the com m ittee his/ her achievements d u ring the cu rrent acad em ic session in the form of a written report highlighting followings:

I.	Academic Performance	--------
II.	Extra Curricular Activities / Community Service, Hostel Activities	**(8 Marks)**
III	Technical Activities / Industrial, Educational tour	**(8 Marks)**
IV	Sports/games	**(14 Marks)**
V	Moral values & Ethics	**(15 Marks)**

NOTE: Report submitted by the students should be typed on both sides of the paper.

A stu d ent w ill su p p ort his/ her achievem ent and verbal & com mu nicative skill throu gh p resentation before the committee. **(30 Marks)**

Moral values & Ethics

Syllabus - Process for Value Education, self-evaluation concept and process.

A minor test will be conducted during the semester and It will be the duty of the concerned teacher assigned to teach Moral valu es & Ethics to su bm it the aw ard s to resp ective chairm an of the d ep artm ent / Director/Principal.

The evaluation of this course will be made by the following Committee.

University Departments:

1	Chairperson of the Department	Chairman
2	Senior Most Faculty Counselor	Member
3	Vice- Chancellor's Nominee	Member

Affiliated Colleges:

4	Director/Principal	Chairman
5	Head of the Department/Sr. Faculty	Member
6	External Examiner to be appointed by the University	Member

Note: Remuneration will be paid to the external examiner only (at par with the other practical examinations).