S Y L L A B U S

BACHELOR OF TECHNOLOGY

SEMESTER SCHEME

Four Year Degree Course

B.Tech., First Year Examination, 2015

Teaching & Examination Scheme and Syllabus

JODHPUR NATIONAL UNIVERSITY, JODHPUR

JODHPUR UNIVERSITY, JODHPUR
Plan and Scheme of Examination for B.Tech. 1 Year (Semester I & II)
COMMON FOR ALL BRANCHES

I Semester- Theory Courses

Sub Code	Subject	No. of Teaching Hours Per Week			Exam. Hours	Marks Allocation				Total
		L	T	P		Theory. Univ. Exam.	Term test	Sessional	Practical Univ. Exam.	
BET101	English	3	1	-	2	80	20			100
BET102	Engineering Mathematics-I	4	1	-	3	80	20			100
BET103	Physics-I	2	1	-	3	80	20			100
BET104	Environmental Engineering	3	-	-	3	80	20			100
BET105	Fundamental of Electrical Engineering	3	-	-	3	80	20			100
BET106	Fundamental of Manufacturing Processes	2	-	-	3	80	20			100
BET 107	Fundamentals of Computer Applications	2	-	-	3	80	20			100
Total		**19**	**3**	**-**		**560**	**140**			**700**

Practical- Courses

Sub Code	Subject	No. of Teaching Hours Per Week			Exam. Hours	Marks Allocation				Total
		L	T	P		Theory Univ. Exam.	Term test	Sessional	Practical Univ. Exam	
BET108	Physics Lab.-I	-	-	2	3			30	20	50
BET109	Environmental Engineering Lab.	-	-	2	3			30	20	50
BET110	Computer Applications Lab.	-	-	2	3			30	20	50
BET111	Electrical Engineering Lab.	-	-	2	3			30	20	50
BET112	Mechanical Workshop	-	-	2	3			30	20	50
BET113	Practical Geometry	-	-	3	3			30	20	50
Total		**19**	**3**	**13**				**180**	**120**	**350**
Contact Hours per week				**35**					**Grand Total**	**1000**

II Semester- Theory Courses

Sub Code	Subject	No. of Teaching Hours Per Week			Exam. Hours	Marks Allocation				Total
		L	T	P		Theory Univ. Exam.	Term test	Sessional	Practical Univ. Exam.	
BET201	English Communication Techniques	3	-	-	3	80	20			100
BET202	Engineering Mathematics-II	4	1	-	3	80	20			100
BET203	Physics-II	2	1	-	3	80	20			100
BET204	Engineering Chemistry	3	-	-	3	80	20			100
BET205	Fundamental of Electronics Engineering	3	-	-	3	80	20			100
BET206	Fundamental of Mechanical Engineering	2	-	-	3	80	20			100
BET207	Fundamental of Computer Programming	3	-	-	3	80	20			100
Total		**20**	**02**	**-**		**560**	**140**			**700**

Practical- Courses

Sub Code	Subject	No. of Teaching Hours Per Week			Exam. Hours	Marks Allocation				Total
		L	T	P		Theory Univ. Exam.	Term test	Sessional	Practical Univ. Exam.	
BET208	English Language Lab.	-	-	2	3			30	20	50
BET209	Physics Lab.-II	-	-	2	3			30	20	50
BET210	Engineering Chemistry Lab.	-	-	2	3			30	20	50
BET211	Fundamentals of Computer Programming	-	-	2	3			30	20	50
BET212	Mechanical Engineering Lab.	-	-	2	3			30	20	50
BET213	Machine Drawing	-	-	3	3			30	20	50
Total		**20**	**2**	**13**				**180**	**120**	**350**
Contact Hours per week				**35**					**Grand Total**	**1000**

BET101 ENGLISH -I

Teaching Hrs. **Exam. Hrs. – 3**

Hrs

L-3 T-1 P-0 **Marks Theory Exam – 80 Term Test – 20**

Total 100

CONTENTS OF SYLLABUS

Units:	Topics	
I	Text Book for detailed study Tongue R.K. and Shiv. K. Kumar- An English Miscellany (Oxford University Publication) • One Lesson each from prose and Poetry Ved Mehta – Between the two words; I: The centre of the universe George Herbert - Virtue • Question Answer from the text book • Comprehension Passages- Seen and unseen, Translation	Lectures Req-6
II:	Grammar • Nouns, Pronouns • Tenses. • Subject verb Agreement • Modal verbs • Jumbled Sentences	Lectures Req-9
III	Grammar • Adjectives • Articles • The Infinitive, Participle & Gerund • The passive	Lectures Req-9
IV	• Application writing • C.V. writing • Letter writing formal & informal	Lectures Req- 9
V	Essay writing • Paragraph writing	Lectures Req-9
		Total Lectures Req- 42

Books for Reference

- High School English Grammar & Composition
  P.C. Wren & Martin, S.Chand & Co., New Delhi
- Murphy's English Grammar, 3rd Edition
  Raymond Murphy, Cambridge University Press
- An Intermediate English Practice Book
  S. Pit Corder, Orient Long Man
- A Remedial English Grammar for foreign Students
  F.T. Wood, Macmillan Publishers
- A University Grammar of English
  Quirk & Green Baum, Orient Longman
- A Practical English Grammar
  Thomson & Martinet , Oxford University Press
- Written Communication in English
  Sarah Freeman, Orient Longman

BET 102 ENGINEERING MATHEMATICS-I

Teaching Hrs. **Exam Hrs. – 3**
Hrs
L-4 T-1 P-0 **Marks Theory Exam.-80 Term test-20 Total**
100

CONTENTS OF SYLLABUS

Units	Topics	
I	**Differential Calculus :**	Asymptotes (Cartesian Coordinates Only),Curvature ,Concavity, Convexity and Point of inflexion (Cartesian Coordinates Only),Curve Tracing (Cartesian and Standard Polar Curves-Cardioids, Lemniscates of Bernoulli Limacine, Equiangular Spiral)
		Lectures Req : 10
II	**Differential Calculus :**	Partial Differentiation, Euler's Theorem on Homogeneous Functions, Approximate Calculations, Maxima & Minima of Two and More Independent Variables, Lagrange's Method of Multipliers
		Lectures Req : 10
III	**Integral Calculus :**	Applications in Finding the Length of Simple Curves, Surface and Volumes of Solids of Revolution, Double Integral, Areas & Volumes by Double Integration, Change of Order of Integration, Beta Function and Gamma Function (Simple Properties)
		Lectures Req : 10
IV	**Differential Equations :**	Differential Equations of First Order and First Degree - Variable Separable, Homogeneous Forms, Reducible to Homogeneous Form, Linear Form, Exact Form, Reducible to Exact Form, Linear Differential Equations of Higher Order with constant Coefficients Only
		Lectures Req : 12
V	**Differential Equations** :	Second Order Ordinary Differential Equations with Variables Coefficients, Homogeneous and Exact Forms, Change of Dependent Variable, Change of independent Variable. Normal Forms, Method of Variation of Parameter
		Lectures Req : 12

Total Lectures Req : 54

Reference Books:

- Jain. R.K. and lyengar, S.R.K., Advanced Engineering Mathematics, Narosa Publishing House, New Delhi.
- Grewal, B.S., Higher Engineering Mathematics, Khanna Publishers, New Delhi.
- Bali, N.P., A Text Book on Engineering Mathematics, Luxmi Publications, New Delhi.
- Kreyszing, E., Advnaced Engineering Mathematics, John Wiley.
- Mehta D.M, Sharma Engineering Mathematics I, Vardan Publisher.
- Ray Wylie, C., Advanced Engineering Mathematics. 6th ed., McGraw Hill.

BET 103 PHYSICS-I

Teaching Hrs. **Exam Hrs.- 3 Hrs**
L-2 T-1 P-0 **Marks Theory Exam.-80 Term test-20 Total 100**

CONTENTS OF SYLLABUS

Unit	Topics	Details of coverage
1	**Magnetic Materials and Electrostatics**	**Lectures required: 06**
	• Classification of magnetic material	• Brief Explanation
	• Types of magnetism	• Dia, Para, Ferro etc.
	• Magnetic domains	• Explanation
	• Ferrites	• Brief description and their applications.
	• Charge distribution	• Explanation
	• Integral/Differential approach to Gauss's Law	• Derivation
	• Poisson and Laplace equation	• No derivation
	• Boundary conditions and Uniqueness theorem	• Explanation and brief derivation
	• Solution of Laplace's equation in rectangular coordinates.	• Derivation, No numerical
2	**Physical Optics**	**Lectures required: 06**
	• Interference,	• Definition & brief introduction, Condition of Interference
	• Interference from parallel thin films,	• Explanation and derivation
	• Newton rings,	• Determination of wavelength, refractive index, formation by two curved surfaces and Newton's ring with white light.
	• Michelson interferometer	• Types of fringes, determination of wavelength of monochromatic light, difference in wavelength between two neighbouring spectral lines and its uses.
3	**Diffraction**	**Lectures required: 06**
	• Diffraction,	• Definition, difference between Fresnels' and Fraunhofer Class
	• Fraunhofer diffraction	• Single Slit (Intensity distribution by calculus method), N slits (derivation for intensity distribution)
	• Plane Transmission Grating,	• Theory, width of Principal Maxima, absent spectra, maximum number of orders available, dispersive power, formation of multiple spectra.
	• Resolving power	• Brief introduction, Rayleigh's criterion and resolving power of grating.
4	**Theory of Relativity**	**Lectures required: 08**
	• Concept of ether;	• Introduction
	• Michelson Morley experiment;	• Explanation with derivation
	• Einstein's postulates,	• Statement
	• Lorentz transformation equations,	• Derivation of equations.
	• Length contraction and Time dilation	• Explanation with derivation
	• Addition of velocity,	• Derivation.
	• Variation of mass with velocity,	• Derivation.
	• Mass-energy relation,	• Derivation.
	• Energy momentum relation.	• Derivation
5	**Electromagnetics**	**Lectures required: 06**
	• Amperes Circuital law	• Derivation
	• Displacement Current	• Brief description
	• Maxwell's Equations (Differential)	• Derivation
	• Electromagnetic Wave Propagation in Free Space	• Derivation
	• Poynting Theorem	• Derivation

Total No. of Periods: 32

Reference Books:

1. A. Ghatak, "Optics"
2. N. Subrahmanyam and Brij Lal, "Optics"
3. R.L. Singhal "Solid State Physics"
4. D.S.Mathur "Mechanics"
5. R K Gaur and S L Gupta "Engg. Physics"
6. J.C. Upadhaya, " Mechanics"
7. K.K. Tiwari, "Electromagnetic & Electronics"
8. B.B. Laud, " Electro magnetic"

BET 104 ENVIRONMENTAL ENGINEERING

Teaching Hrs. **Exam. Hrs. – 3**

Hrs

L-3 T-0 P-0 **Marks Theory Exam – 80 Term Test – 20**

Total 100

CONTENTS OF SYLLABUS

Units: Topics

I Water: **Lectures Req: 8**

Sources of water, Impurities in water, Hardness of water, Units of hardness, Inter relationship between various units, Degree of hardness, Determination of hardness by Clark's test and Complexometric (EDTA) method, Numerical problems based on hardness and EDTA method.

Boiler troubles their causes, disadvantages and prevention: Carry over (Priming and Foaming), Boiler Corrosion, Scale and Sludge formation, Caustic embrittlement.

II Water treatment: **Lectures Req: 9**

Requisites of drinking water, Treatment of water, Disinfection, Break point chlorination, Softening of water by Lime - Soda, Zeolite and Ion-exchange process, Mixed bed demineralization, Numerical problems based on Lime - Soda and Zeolite softening method.

III Environmental pollution and control: **Lectures Req: 8**

Air Pollution, Harmful effects of air pollution, Control of air pollution, Noise pollution, Adverse effects and control of noise pollution, Global warming, Acid rain, Ozone depletion, Objectives and definitions of Environmental acts and regulations for pollution control (brief description only), Necessity and methodology of Environmental Impact Assessment (EIA).

IV Corrosion and its prevention: **Lectures Req: 9**

Definition and its significance, Mechanism of corrosion (Dry and Electrochemical Corrosion), Factors affecting rate of corrosion, Protection against corrosion, Protective metal coating.

Solid waste management:

Introduction to solid waste management, classification, collection and disposal of solid waste.

V Phase rule: **Lectures Req: 8**

Statement: Definition and meaning of the terms involved, Application to One component system (Water system and Sulphur system), Study of two component system (Pb-Ag system).

Renewable energy sources:

Elementary ideas of renewable sources of energy, Potential of renewable sources of energy in India.

Total Lectures Req. 42

Reference Books:

1. Chemical Process Industries By R. Norris Shreve & Joseph A. Brink, Tata McGraw Hill Publishing Co. New Delhi
2. Shreve's Chemical Process Industries By George T. Austin. McGraw Hill Book Co.
3. Industries Chemistry By B.K Sharma, Krishna Prakashan Mandir, Meerut.
4. Engineering Chemistry By P.C. Jain and Monica Jain. Dhanpat Rai Publishing Company (P) Ltd. New Delhi.
5. Engineering Chemistry By S.K. Jain and K.D. Gupta, Jaipur Publishing House, Jaipur
6. Environmental Chemistry By Anil Kumar De, New Age International (P) Limited. New Delhi.
7. Environmental Chemistry and Pollution Control (Latest ed.), By S.S. Dara.
8. A Basic in Environmental studies, By S.Deswal and A.Deswal.

BET105 Fundamentals of Electrical Engineering

Teaching Hrs. **Exam. Hrs. : 3 Hrs.**
L-3, T-0, P-0 **Exam Marks: 100 {Internal (20) & University (80)}**

CONTENTS OF SYLLABUS

Units	Topics	Details of Coverage	Lectures required: 10
I	**Elementary Concepts**		
	• Electrical Circuit	: Various types of elements, Basic electrical quantities	
	• Various circuits and parameters	: Introduction to linear & nonlinear circuits, RLC parameters, Lumped & distributed networks. self inductance & mutual inductance	
	• Energy sources	: Voltage & current sources, series & parallel connections of sources, Source conversion techniques.	
	• Basic laws	: Ohm's law, KCL, KVL, Nodal and Mesh analysis	
	• AC waveforms	: Introduction to waveforms such as square, triangular, saw-tooth, concept of R.M.S. & average values, elementary method of obtaining average value & R.M.S, value Various connections & theorem's : Y to Δ & Δ to Y connections, superposition theorem, Thevenin Theorem.	
II	**Single Phase & Three Phase A.C. Circuits**		**Lectures required: 8**
	• Single Phase AC Circuit	: Generation of single phase a.c. voltage, E.M.F. equation, average, R.M.S. & effective values.	
	• Circuit details	: R.L.C. series, parallel & series parallel circuits, complex representation of impedances, phasor diagram, power & power factor	
	• Three Phase AC Circuit	: Generation of three phase a.c. voltage, line & phase quantities, three phase balanced circuits, phasor diagrams, measurement of power in three phase balanced circuits.	
III	**D.C. Machines**		**Lectures required: 5**
	• D.C. Generator	: Concept of E.M.F. generation, excitation system, series, shunt & compound generators, Characteristics.	
	• D.C. Motor	: Series, Shunt & compound types, Characteristics and their Uses	
IV	**A.C. Machines**		**Lectures required: 9**
	• Transformer	: Principle of transformer, ideal transformer, basic construction, equivalent circuit & its phasor diagrams (No Load and On Load)	
	• Three Phase inductions motor	: Concept of rotating magnetic field, three phase induction motor, principle of operation, equivalent circuit as a rotating transformer & phasor diagram.	
	• Synchronous Machine	: Synchronous machine: Principle of operation of generator & motor, comparison with induction machine.	
V	**Electrical Measuring Instruments**		**Lectures required: 8**
	• Measuring Instruments	: Introduction, types of measuring instruments, Deflection, controlling & damping torque, Galvanometer, moving coil instruments, shunts & multipliers, moving iron ammeter & voltmeter. Dynamometer wattmeter, Energy meter.	

Reference Books:

i) S.K. Sahdev : Electrical & Electronics Engineering
ii) B.L. Theroya : Fundament of Electrical Engineering
iii) K.R. Niaza : Electrical & Electronics Engineering
iv) J.B. Gupta : Electrical & Electronics Engineering

BET 106 FUNDAMENTALS OF MANUFACTURING PROCESSES

Teaching Hrs. **Exam Hrs. – 3 Hrs.**
L-2 T-0 P-0 **Marks Theory Exam.-80 Term Test – 20 Total 100**

CONTENTS OF SYLLABUS

Unit	Topics	Details of Coverage
I	**Engineering Materials**	Classification of Engineering Materials: Plain Carbon Steel, Types of cast irons, composition, properties & applications. Properties & application of aluminum, copper, types of brasses, their composition & applications. Definition of mechanical properties like elasticity, toughness, resilience tensile strength, ductility, malleability, brittleness & hardness
II	**Fabrication Processes**	Introduction to wood working, types of wood, advantages of timber, qualities of good timber, seasoning of wood, defect in timber, wooden joints, ply wood, ply board.Gas welding, Arc welding tools & equipment, Introduction to soldering and brazing, Introduction to bench working operations.
III	**Manufacturing Processes**	Forgeability and forging temperatures, Forging operations, forging hand tools and their applications, hand forging operations: like upsetting, drawing, punching & drifting etc. Definitions and functions of pattern, pattern making, types of pattern, molding tools, molding boxes, molding sands, compositions and sand preparation.
IV	**Metal Machining Processes**	Machine tools: Classifications Specifications Working and operations of Centre lathe, Shaper and Drilling Machines
V	**Power Transmission in Machine Tools**	Power Transmission: Classification And Applications of Various Drives Belt, Chain, Gear (Excluding Epicyclic Gear Train) And Their Velocity Ratios. Introduction to Clutches, Couplings, Pulleys and their applications.

Total Lectures Required: 29

Reference Books:

1. Elements of Workshop Technology Vol-I &II by S K Hazara Choudhury, S K Bose A K Hazra Choudhury Nirjhar Roy ; Media Promoters & Publishers Pvt. Ltd.
2. A Course in Workshop Technology Vol I & II by B S Raghuvanshi ; Dhanpat Rai & co.
3. Manufacturing Technology by P N Rao; Tata Mcgraw-Hill Publishing Co. Ltd.
4. Theory of Machines by S S Ratan;Tata McGraw Hill Publishing Co.Ltd.

BET107 Fundamentals of Computer Applications

Teaching Hrs **Exam Hrs. – 3 Hrs**
L-2 T-0 P-0 **Marks Theory Exam.-80 Term Test – 20 Total 100**

OBJECTIVE: Familiarity with Computer software, network and its uses.

CONTENTS OF SYLLABUS

Units	Topics	Details of Coverage
I	**Getting Acquainted with Computer**	Explanation of evolution of Computers. Explanation with Block Diagram Computer Architecture & Building Blocks. Memory & I/O devices. Working Principles of Various Storage Devices, Basic Concepts & Examples Various Configurations of Branded & Assembled PC's. Lectures Req:8
II	**Number System**	Binary Octal Decimal and Hexadecimal. Representation of nos., Integers and Floating Point nos. Representation of Characters: ASCII & EBCDIC codes. Binary arithmetic : Addition, Subtraction, Compliments Mutual Conversions. Lectures Req:06
III	**Data Processing Tools**	Elementary Concepts in Operating System, Textual Vs GUI Interface, Introduction to DOS, MS -Windows, MS office Tools, MS WORD, MS EXCEL, MS Power Point, Tools for Data Management, Introduction to Latex for Report Writing, Use of MS-Office in Project Management using Sample Projects. Lectures Req:06
IV	**Networks**	LAN, MAN, WAN. Intranet & Internet: WWW, Web Browser, Search Engine, Email, Cryptography, Digital Signature, Smart Card Technology, Virus & Antivirus. Lectures Req:06
V	**IT Trends**	Introduction to Decision Support System and Executive information system. Basic concepts of Blue-tooth and Wi-Fi. Application of IT to other Areas:- E Commerce, Electronic governance, Open Source Technology and Cloud Computing. Lectures Req:06

Total Lectures Req: 32

Reference Books:-

1. Fundamentals of Computer by E Balaguruswamy.
2. Fundamentals of Computer by Rajaraman.
3. Computer Fundamentals by P.K. Sinha.
4. Computer Fundamentals by Anita Goel.

BET 108 PHYSICS LAB-I

Teaching Hrs. **Exam Hrs.- 3 Hrs**
L-0 T-0 P-2 **Marks Sessional -30 Practical-20 Total 50**

S. No. List of Experiments

OPTICS

I. To determine the wave length of Sodium light by Newton's rings.
II. To determine the specific rotation of Glucose (Sugar) solution using a Polarimeter.
III. To determine the wave length of Sodium light by Michelson's Interferometer.
IV. To determine the dispersive power of material of prism for violet and yellow colors of mercury light with the help of a spectrometer.
V. To verify the expression for the resolving power of a telescope

ELECTRONICS / ELECTRICAL

VI. To convert a galvanometer into an Ammeter of range 1.5 Amps and calibrate it.
VII. To study the variation of semiconductor resistance with temperature and hence determine the band gap of semiconductor in the form of reverse biased P-N junction diode.
VIII. To determine the high resistance by the method of leakage, using a Ballistic Galvanometer.
IX To determine dielectric constant of a liquid using moving coil Ballistic Galvanometer with standard parallel plate condenser.

BET 109 ENVIRONMENTAL ENGINEERING LAB

Teaching Hrs. **Exam. Hrs. – 3**

Hrs

L-0 T-0 P-2 **Marks Sessional – 30 Practical – 20 Total**

- 50

(Any Eight experiments are to be performed.)

S. No. List of Experiments:

I. Determination of hardness of water by different methods.

II. Determination of strength of NaOH and Na_2CO_3 in a given alkali mixture.

III. Determination of available chlorine in water.

IV. Measurement of residual chlorine in water.

V. Measurement of pH of a given sample by pH meter and measurement of strength of acid and base pH metrically.

VI. Measurement of conductivity of a given sample by conductivity meter and measurement of strength of acid and base by conductometric method.

VII. Measurement of total solids, settlable solids and dissolved solids in sewage.

.

Reference Books:

1. A Text Book on Experiment and Calculation in Engineering Chemistry By S.S. Dara.
2. Laboratory Manual on Engineering Chemistry By S.K. Bhasin and Sudha Rani.
3. Vogel Text book of Quantitative Chemical Analysis By G.H. Jeffery, J. Bassett, J. Mendham & R.C.Denney.
4. Instrumental Methods of Chemical Analysis By B.K. Sharma.
5. Practical Engineering Chemistry By Sanjay Sharma.
6. Environmental Engineering Laboratory Manual By Vivek Pandey and Sama Jain.

BET110 Computer Applications Lab

Teaching Hrs. **Exam Hrs. – 3 Hrs.**
L-0 T-0 P-2 **Marks Sessional - 30 Practical – 20 Total 50**

OBJECTIVE: To make the user system friendly & to get hands on computer experience.

S. No	List Of Experiments	
I	**Assignment** MS-WORD Text Manipulations, Spell Check, Find and Replace, Picture Insertion and Alignment, Creation of Templates, Mail Merge Concept, Creation of Tables, Formatting Tables, Splitting the Screen, Macro etc.	(4 Labs)
II	**Assignment** MS -EXCEL Worksheet, Excel Formulations (Date , Time, Statistical, Mathematical, Financial Functions) , Formatting , Creation of Charts, Performing what if analysis , Annotating worksheet, Pivot tables ,Special facilities of wizard ,Filtering ,subtotals. Sorting, Validation, Consolidation of data.	(3 Labs)
III	**Assignment** MS –POWERPOINT Working with Slides, Adding Headers and footers , Changing Slide layout ,Working fonts and bullets ,Inserting Clip art, Applying Transition and animation effects, Run and Slide Show, Performing a Rehearsal, Creating Custom Slide Show, Pack and Go wizard.	(3 Labs)
IV	**Assignment** MS –ACCESS Database management system, An Overview of Access, Access Tables, Data Types, Access Query, Access Reports, Creating Relationships , OLE (importing & exporting data).	(3 Labs)
V	**Assignment** DOS, Formatting, Trouble Shooting, Email, Search Engine, Download & Upload, Community Group.	(3 Labs)

Total Labs Req: 16

BET 111 Electrical Engineering Lab

Teaching Hrs. **Exam Hrs. : 3**

L-0, T-0, P-02 **Exam Marks: 50 {Internal (30) & University (20)}**

CONTENTS OF SYLLABUS

S. No.	List of Experiments	Details of Coverage	Labs required: 17
1.	Graphical Symbols and Electrical components	Study of graphical symbols used to indicate Electrical components in single line diagrams. Functional study of various Electrical components viz. fuse, MCB, Relays, switches etc.	
2.	Earthing- study and types.	Study of the necessity of earthing, Advantages and types of earthing-plate earthing and pipe earthing.	
3.	Electrical Ceiling Fan	Study of parts of ceiling fan, Its working, connection and testing.	
4.	Types of House Wiring	Study of different types of house wiring, materials required casing, capping etc. Making the connection of house wiring including energy meter , MCB, ceiling fan, lamp and three pin socket. Staircase wiring- controlling a lamp from two different positions.	
5.	Electrical Iron	Study of electric iron, its parts and testing.	
6.	Fluorescent Tube Light	Study, working and circuit connection.	
7.	Introduction of various active and passive components.	Identification, testing and application of resistors, inductors, capacitors, PN-diode, Zener diode, LED, LCD, UJT, BJT, FET, SCR, Photo diode and Photo Transistor.	
8.	Electronic instruments.	Functional study of CRO, analog and digital multimeters and Function generator.	
9.	Electronic Hardware	Study of soldering-desoldering, bread board, printed circuit boards(PCBs) and to learn mounting of components on PCB.	
10.	Rectifier circuits	Study of single phase half-wave rectifier and full-wave rectifiers. Make the connections on bread board and observe the effect of filters on CRO.	

BET 112 MECHANICAL WORKSHOP

Teaching Hrs. **Exam Hrs. – 3 Hrs.**
L-0 T-0 P-2 **Marks Sessional-30 Practical – 20 Total 50**

S. No. List of Experiments

I Carpentry Shop

- To prepare a dovetail joint.

II Foundry Shop

- To prepare Mould of given pattern and casting in aluminum.

III Welding Shop

- Demonstration & practice in gas welding on mild steel flat.
- Demonstration & practice in arc welding on mild steel flat.
- To prepare a Lap-joint by arc welding.

IV Machine Shop

- To prepare a job on lathe machine involving various operations like facing, step turning, chamfering & knurling etc.
- To prepare a job on shaper involving angular cutting.

V Fitting Shop

- Demonstration for use of bench working tools.
- To prepare a job involving various fitting operations, like filling, sawing, drilling & tapping etc.

VI Sheet Metal Shop

- Demonstration & practice in Brazing on thin sheet.
- To prepare a funnel from a sheet metal & soldering the joint

BET 113 PRACTICAL GEOMETRY

Teaching Hrs. **Exam Hrs. – 3 Hrs.**
L-0 T-0 P-3 **Marks Sessional-30 Practical – 20 Total 50**

Unit	Details of Coverage	
I	• Lines and Dimensioning.	**(2 Labs)**
	• Scales: Representative factor; Plain scales; Diagonal scales; Comparative scale; Scale of chords.	
II	• Conic Sections: Construction of ellipse, parabola and hyperbola by different methods; Normal and Tangents.	**(4 Labs)**
	• Special Curves: Roulettes; Cycloid; Epicycloid; Hypo-cycloid; Involute; Archemedian; Logarithmic spirals.	
III	• Projections: Types of projections; Orthographic projection; First angle and third angle projection.	**(4 Labs)**
	• Projections of points and lines: True inclinations; True length of straight lines; Traces of straight lines; Auxiliary planes.	
	• Projections of planes and solids: Projections of planes; Projections of polyhedra and solids of revolution.	
IV	• Section of Solids: Section of right solids by normal and inclined planes.	**(2 Labs)**
	• Development of Surfaces: Parallel line and radial line method for right solids.	
V	• Isometric Projections: Isometric Scale; Isometric axes; Isometric projections of planes and solids.	**(3 Labs)**

Total Labs Required : 15

Reference Books:

1. Engineering Drawing by N.D.Bhatt, V.M.Panchal; Charotar Publishing House.
2. Engineering Graphics by P. S. Gill; K. Kataria & Sons
3. A text book of Engineering Drawing by R. K. Dhawan; S. Chand & Company Ltd.
4. Engineering Drawing & Auto Cad by T. Jeyapoovan; Vikas Publishing House

BET201 ENGLISH COMMUNICATION TECHNIQUES

Teaching Hrs. **Exam. Hrs. – 3 Hrs**

L-3 T-1 P-0 **Marks Theory Exam – 80 Term Test – 20 Total 100**

CONTENTS OF SYLLABUS

Units	Topics	
I	Grammar • Adverbs • Prepositions • Verbs with preposition • Conjunctions & Connectors	Lectures Req- 9
II	Grammar • Reported speech • Conditionals • Fill in the blanks using suitable word	Lectures Req- 9
III	• Word formation and vocabulary building • Affixes • Synonyms & Antonyms	Lectures Req- 9
IV	• Idioms and phrases • Words commonly confused (mispronounced and mis-spelt) • One word substitutes	Lectures Req- 9
V	• Report writing • Précis writing • Book Review • Phonetic symbols & Transcription • English miscellany – 2 Lessons 1. Prose & 1. Poetry Tongue R.K. and Shiv. K. Kumar- An English Miscellany (Oxford University Publication) o Bertrand Russell – The Happy Man o Alexander Pope – Ode on Solitude	Lectures Req- 6

Total Lectures Required- 42

Books for Reference

- High School English Grammar & Composition
  P.C. Wren & Martin, S.Chand & Co., New Delhi
- Murphy's English Grammar, 3rd Edition
  Raymond Murphy, Cambridge University Press
- An Intermediate English Practice Book
  S. Pit Corder, Orient Long Man
- A Remedial English Grammar for foreign Students
  F.T. Wood, Macmillan Publishers
- A University Grammar of English
  Quirk & Green Baum, Orient Long Man
- A Practical English Grammar
  Thomson & Martinet , Oxford University Press
- Written Communication in English
  Sarah Freeman, Orient Longman
  A handbook of Pronunciation
  P V Jindal, (), Hyderbad

BET202 ENGINEERING MATHEMATICS-II

Teaching Hrs. **Exam Hrs. – 3 Hrs.**
L-4 T-1 P-0 **Marks Theory Exam.-80 Term test-20 Total 100**

CONTENTS OF SYLLABUS

Units	Topics	
I	**Coordinate Geometry of Three Dimensions**	Equation of a sphere, Intersection of a sphere and a plane, tangent plane ,normal Lines, Right circular cone, Right circular cylinder
		Lectures Req : 10
II	**Matrices** :	Linear dependence of vectors ,Rank of a matrix, inverse of a matrix by elementary transformations, Solution of simultaneous linear equations, Eigen values and Eigen vectors, cayley-Hamilton theorem (without proof), Diagonalization of matrix
		Lectures Req : 10
III	**Vector Calculus** :	Scalar and vector field, differentiation & integration of vector functions, Gradient, Divergence, Curl and Differential Operator, Line, Surface and volume integrals, Green's Theorem in a plane, Gauss' and Stoke's Theorem (without proof) and their Applications
		Lectures Req : 12
VI	**Dynamics:**	Angular Motion, Radial and transverse Velocity and Accelerations, Rectilinear Motion in Resisting Medium.
		Lectures Req : 10
V	**Differential Equations :**	Series Solutions of Second Order Linear Differential Equations with , Variable Coefficients (Complementary Function only), Partial Differential Equations of First Order, Lagrange's Form, Standard Forms, Charpit's Method
		Lectures Req : 12

Total Lectures Req : 54

- Jain. R.K. and lyengar, S.R.K., Advanced Engineering Mathematics, Narosa Publishing House, New Delhi.
- Grewal, B.S., Higher Engineering Mathematics, Khanna Publishers, New Delhi.
- Bali, N.P., A Text Book on Engineering Mathematics, Luxmi Publications, New Delhi.
- Kreyszing, E., Advnaced Engineering Mathematics, John Wiley.
- Mehta D.M, Sharma Engineering Mathematics II, Vardan Publisher.
- Ray Wylie, C., Advanced Engineering Mathematics. 6th ed., McGraw Hill.

BET 203 PHYSICS-II

Teaching Hrs. **Exam Hrs.- 3 Hrs**
L-2 T-1 P-0 **Marks Theory Exam.-80 Term test-20 Total 100**

CONTENTS OF SYLLABUS

Unit	Topics	Details of coverage
1	**LASER**	Lectures required: **06**
	• Principle and production,	• Stimulated and spontaneous emission and induced absorption.
	• Einstein's coefficients,	• Expression for energy density and ratio of Spontaneous to stimulated emission.
	• Requisites of a Laser system,	• Active medium and pumping system and resonant cavity.
	• Condition for Laser action,	• Explanation.
	• Principle, construction and working of He-Ne, & Semiconductor Laser	• Explanation with suitable diagrams & Principle and working of any type of P-N junction semiconductor. Applications of Laser
2	**Holography and Modern Physics**	Lectures required: **05**
	• Holography	• Basic principles and its applications, Construction and Reconstruction (No derivation)
	• Photo-electric effect	• Introduction and experimental results
	• Unability of wave theory of light to explain Photo-electric effect	• Explanation.
	• Einstein's Photo-electric	• Explanation.
	• Compton effect and quantum nature of light	• Brief introduction and derivation of Compton shift.
3	**Polarization**	Lectures required: **06**
	• Polarization,	• Representation of various lights, Polarization by reflection, Brewster's and Malus laws,
	• Double refraction,	• Huygen's theory, Polaroid's,
	• Quarter and Half wave plates,	• Production and analysis of plane elliptical and circularly polarized light.
	• Optical activity.	• Fresnel's theory of optical rotation, Specific rotation, Biquartz and Laurent half-shade polarimeters.
4	**Fibre Optics and Nuclear detectors**	Lectures required: **06**
	• Optical Fibres	• Introduction and basic theory.
	• Angle of acceptance	• Expression
	• Numerical aperture	• Expression with diagram, No numerical.
	• Applications of Optical fibre.	• Brief idea
	• Nuclear dectectors	• Introduction
	• Ionization chamber, Proportional Counter, G M Counter, Scintillation Counter	• Construction, working and properties
5	**Quantum Physics**	Lectures required: **06**
	• Wave function	• Complex wave function, Physical significance and normalization (explanation).
	• Schrödinger's Equation	• Setting up of 1D and 3D time dependent and independent equations.
	• Eigen values and eigen functions	• Explanation.
	• Application of Schrödinger's Equation	• Derivation of equation for particle trapped in one dimensional potential well of infinite height.
	• Density of energy states, Fermi energy level	• Explanation.

Total No. of Periods : **29**

Reference Books:

1. A. Ghatak, "Optics"
2. N. Subrahmanyam and Brij Lal, "Optics"
3. Jenkins and White, "Fundamentals of Optics"
4. R.L. Singhal "Solid State Physics"
5. D.S.Mathur "Mechanics"
7. K. Thyagarajan and A.K.Ghatak "LASERS"
6. R K Gaur and S L Gupta "Engg. Physics"
7. S.N Ghoshal "Atomic and Nuclear Physics Vol.1 & 2"

BET 204 ENGINEERING CHEMISTRY - II

Teaching Hrs. **Exam. Hrs. – 3 Hrs**

L-3 T-0 P-0 **Marks Theory Exam – 80 Term Test – 20 Total 100**

CONTENTS OF SYLLABUS

Units: Topics

I **Chemical Fuel (Part I):** **Lectures Req: 9**

Origin and classification of fuels

Solid fuels: Coal, Its origin and classification, Proximate and Ultimate analysis of coal, Significance of the constituents, Gross and Net calorific values, Determination of calorific value by Bomb Calorimeter (Related numerical problems), Soft and Metallurgical coke, Carbonization process, Manufacture of coke: Beehive Coke ovens and Byproduct Coke ovens, Combustion and requirement of oxygen/air in combustion process.

Liquid Fuels: Merits and demerits, Petroleum and Refining of petroleum, Synthetic petrol, Refining and Reforming of gasoline, Cracking, Knocking, Octane number, Cetane number and their significance, Antiknocking agents.

II Chemical Fuel (Part II): **Lectures Req: 9**

Gaseous Fuels: Advantages, Manufacture, Composition and calorific value of coal gas and oil gas, CNG, LPG, Determination of calorific value by Juckner's calorimeter and related numerical problems, Flue gas analysis by Orsat's apparatus.

Nuclear Fuels: Nuclear binding energy, Nuclear fission and Nuclear fusion, Elementary idea about reactor concepts, Nuclear power reactor and Breeder reactor.

III Polymers: **Lectures Req: 8**

Basic concepts and Terminology such as Functionality, Degree of polymerization, Different definitions of weight viz. Mw, Mn, Mv (Numerical problems based on them), Thermoplastic, Thermosets Linear, Branched and Cross- linked polymers, Tacticity of polymers, Homo and Copolymers (classification based on repeat unit), Addition, Condensation and Ionic polymerization, Constituents of plastics and their uses, Preparation, Properties and uses of Polyethylene, PVC, Teflon, Bakelite, Terylene and Nylon, Natural rubber, Vulcanization, Synthetic rubber Viz. Buna-S, Buna-N, Butyl, Neoprene, Thiokol, Polyurethane and Silicones rubber.

IV Lubricants: **Lectures Req: 8**

Classification, Types of lubrication: Thick film or Hydrodynamic lubrication, Thin film or Boundary lubrication and Extreme pressure lubrication , Properties and uses, Viscosity and Viscosity index, Flash point and Fire point, Cloud and Pour point, Steam emulsification number.

New Engineering Materials:

Brief idea of following: Super conductor, Organic electronic materials, Fullerenes and Optical fibers.

V **Cement:** Manufacture of Portland cement, Vertical shaft kiln technology, Chemistry of setting and hardening **Lectures Req: 8**

Refractories: Definition, Properties, Classification, Requisites of good refractory, Properties of silica and fire clay refractory.

Glass: Preparation, Varieties and uses.

Total Lectures Req. 42

Reference Books:

1. Chemical Process Industries By R. Norris Shreve & Joseph A. Brink, Tata McGraw Hill Publishing Co. New Delhi
2. Shreve's Chemical Process Industries By George T. Austin. McGraw Hill Book Co.
3. Polymer Science and Technology By Joel R. Fried. Prentice Hall Publications.
4. Industries Chemistry By B.K Sharma, Krishna Prakashan Mandir, Meerut.
5. Engineering Chemistry By P.C. Jain and Monica Jain. Dhanpat Rai Publishing Company (P) Ltd. New Delhi.
6. Engineering Chemistry By S.K. Jain and K.D. Gupta, Jaipur Publishing House, Jaipur
7. Chemistry in Engineering and Technology (Vol I & II) (Latest ed.), By J.C. Kuriacase and J. Rajaram.

BET 205 FUNDAMENTAL OF ELECTRONICS ENGG. (New Scheme)

Teaching Hrs. **Exam. Hrs. – 3 Hrs.**
L-3 T-1 P-0 **Marks Theory Exam -80 Term Test – 20 Total 100**

CONTENTS OF SYLLABUS

Unit	Topics	Details of Coverage
I	**Resistors, Capacitors & Inductors**	Classification of resistors, colour coding, tolerance & various parameters related to resistors wire wound resistors, fixed & variable resistors. Special resistors LDR, VDR. Classification of capacitors, colour coding of capacitors, parameters related to capacitors, fixed & variable capacitors. Classification of inductors. Fixed & variable inductors. Applications of resistors, capacitors & inductors **Lectures Req: 8**
II	**Semi Conductor & P.N. Junction Diode**	Metal, non-metals, semiconductor & their energy band diag. intrinsic & extrinsic semiconductors, formation of barrier, forward & reverse bias, V-I characteristics of diode. Dynamic & static resistance, working principle & V-I characteristics of zener diode. Working of photo diode, solar cell & LED. Diode in Half wave & full wave rectifier. P IV & ripple factor, block diagram of dc power supply. **Lectures Req: 8**
III	**Bipolar Junction Transistors (BJT)**	NPN & PNP transistors working, charge transportation phenomenon. Transistor as an amplifier, configurations of transistors (CB, CE & CC) & their comparison, regions of BJT & their application. **Lectures Req: 8**
IV	**Digital Electronics**	Number system, conversion from one base to another base. Complements, 1's & 2's complements & complement subtraction, Boolean postulates & Boolean algebra, logic gates & truth tables, universal gates. **Lectures Req: 6**
V	**Basics of Communication System**	Analog and digital signals. Basic block diag. of communication system. Modulation demodulation & need of modulation. Different types of modulation & comparison. Block diag. of Superhetrodyne receiver. Advantages of digital communication & block diag. of digital communication system. **Lectures Req: 6**
		Total Lectures Required: 36

Recommended Books:

1. Electronic Communication Systems, G. Kennedy, Davis
2. Electronic Principles, Albert Malvino, David J. Bates
3. Digital Principles and Applications, A.P. Malvino, D.P. Leach
4. Electronic Devices & Circuits, S.K. Sahdev

BET 206 FUNDAMENTALS OF MECHANICAL ENGINEERING

Teaching Hrs. **Exam Hrs. – 3 Hrs.**
L-2 T-0 P-0 **Marks Theory-80 Term Test – 20 Total 100**

CONTENTS OF SYLLABUS

Unit	Topics	Details of Coverage
I		
	• **Basic Concepts**	Thermodynamic systems; Properties; Work and heat; Zeroth Law of thermodynamics.
	• **Working Fluids**	Ideal Gas Laws; Calculation of properties of ideal gases for various thermodynamic cyclic and non-cyclic processes.
II		
	• **First Law of Thermodynamics**	First Law of thermodynamics; Non-flow and flow energy equations; Numerical problems based on ideal gases.
	• **Second Law of Thermodynamics**	Statements of Second Law of Thermodynamics; Reversible process; Entropy; Carnot cycle (Descriptive Only).
III		
	• **Internal Combustion Engines**	Otto and Diesel cycle; Air standard efficiency. (Descriptive Only). Classification; Two and four stroke engines; Construction and working of petrol and diesel engines; Comparison of petrol and diesel engines; Comparison of 4 - stroke and 2 - stroke engines; Principle and working of simple carburetor.
IV		
	• **Properties of Steam**	Generation of steam; Quality and properties of steam; Use of steam table; Mollier chart and T-s diagram for steam properties and various Processes.
	• **Steam Generators**	Classification of steam generators; Construction and working of Babcock and Wilcox boiler and Cochran boiler.
V		
	Refrigeration and Air-conditioning	Elementary concepts of refrigeration and air-conditioning; Vapour compression cycle; Working, principle and schematic diagrams of refrigerators, window air conditioners and ice plants.
	Gas Compressors	Classification; Working of reciprocating compressor, rotary compressor, centrifugal compressor and axial flow compressor; Comparison; Applications.

Reference Books:

1. Engineering Thermodynamics by P.K. Nag; Tata McGraw-Hill Publishing Co. Ltd.
2. Thermal Engineering Vol-I and Vol-II by M.L. Mathur and F.S. Mehta; Jain Brothers
3. Applied Thermodynamics by Onkar Singh; New Age International Publishers.
4. Thermal Science and Engineering by D.S. Kumar; S.K. Katariya & Sons.

BET207 Fundamentals of Computer Programming

Teaching Hrs. **Exam Hrs. – 3 Hrs.**
L-2 T-0 P-0 **Marks Theory Exam.-80 Term Test – 20 Total 100**

OBJECTIVE: To develop proficiency in the basic computer language 'C'.

CONTENTS OF SYLLABUS

Units	Topics	Details of Coverage
I	**Introduction to 'C' Programming**	Concept of Algorithm and Flowchart for program development. Fundamental data types, Operators and Expressions in C. Storage classes, operator precedence and associability. Lectures Req:06
II	**Conditional execution in 'C'**	Applying if and switch statements, nesting if and else, use of break and default with switch, program loops and iterations: use of while, do while and for loops, multiple loop variables, use of break and continue statements. Lectures Req:08
III	**Array and Pointers**	Array notation and representation, manipulating array elements. Pointers: Introduction, declaration, applications Void Pointer. Lectures Req:06
IV	**Structure and Functions**	Structure, union, enumerated data types: Notation, Representation and manipulation. Functions: Introduction, types of functions, passing values to functions, Array in functions, recursive functions. Lectures Req:06
V	**File Handling and Macro**	File Handling (Opening in different modes and closing of file ,fscan and fprint only) Concept of Preprocessor, Macro Substitution and Compilation Process of Macro. Lectures Req:06

Total Lectures Req: 32

Reference Books:

1. Programming in ANSI 'C' by E Balaguruswamy.
2. Let Us 'C' by Yashwant Kanetkar
3. Programming with 'C' Schaum's Outline.
4. A practical Approach to programming in C by R S Salaria**.**
5. The C programming Language by Brian W. Kernighan and Dennis M. Ritchie

BET208 ENGLISH LANGUAGE LAB

Teaching Hrs. **Exam. Hrs. – 3**

Hrs

L-0 T-0 P-2 **Marks Sessional – 20 Practical – 30**

Total 50

CONTENTS

- Phonetic symbols & Transcription
- Communication & Aspects of Communication
- Presentations (seminar)
- Extempore Speaking
- Group discussions
- Interview Preparations
- Viva- Voce

BET 209 PHYSICS LAB-II

Teaching Hrs. **Exam Hrs.- 3 Hrs**
L-0 T-0 P-2 **Marks Sessional -30 Practical-20 Total 50**

S. No. List of Experiments

OPTICS

I. To determine the wave length of monochromatic light with the help of Fresnel's Biprism.
II. To determine the wavelength of prominent lines of mercury by plane diffraction grating with the Help of a spectrometer.
III. To determine the height of water tank with the help of a sextant.
IV. To determine the transmission coefficient of transparent glass plate by Lummer-Brodhum photometer.

ELECTRONICS / ELECTRICAL

V. To convert a galvanometer into a Voltmeter of range 1.5 Volts and calibrate it.
VI. To determine the specific resistance of the material of a wire by Carey-Foster's bridge.
VII. To study the variation of thermo emf of Iron-Copper thermo couple with temperature.
VIII. To study the charge & discharge of a condenser and hence determine time constant.
IX. To study the variation of magnetic field along the axis of a current carrying coil & to estimate the radius of the coil.

BET 210 ENGINEERING CHEMISTRY LAB - II

Teaching Hrs. **Exam. Hrs. – 3**

Hrs

L-0 T-0 P-2 **Marks Sessional – 30 Practical – 20 Total**

- 50

(Any Eight experiments are to be performed.)

S. No. List of Experiments

I. Determination of strength of $CuSO_4$ iodometrically
II. Determination of strength of $K_2Cr_2O_7$ iodometrically.
III. Determination of strength of ferrous ammonium sulphate with the help of $K_2Cr_2O_7$.
IV. Estimation of copper in brass.
V. Determination of viscosity of lubricating oil by redwood viscometer.
VI. Determination of flash and fire point of lubricating oil by pensky-marten apparatus.
VII. Determination of cloud and pour point of lubricating oil.

Reference Books:

1. A text book on experiment and calculation in engineering chemistry By S.S. Dara.
2. Laboratory manual on engineering chemistry By S.K. Bhasin and Sudha Rani.
3. Vogel Text book of Quantitative Chemical Analysis By G.H. Jeffery, J. Bassett, J. Mendham & R.C.Denney
4. Instrumental methods of Chemical Analysis By B.K. Sharma.
5. Practical Engineering Chemistry By Sanjay Sharma.
6. Environmental Engineering laboratory manual By Vivek Pandey and Sama Jain.

.

BET 211 FUNDAMENTALS OF COMPUTER PROGRAMMING

Teaching Hrs. Exam Hrs. – 3 Hrs.
L-0 T-0 P-2 Marks Sessional - 30 Practical – 20 Total 50

OBJECTIVE: Inculcating the programming habits in practical.

S. No	List Of Experiments	
I	**Assignment 1st**	
	• Simple input output program integer, real, character and string (Formatted & Unformatted)	**(3 Labs)**
II	**Assignment 2nd**	
	• Condition statement programs (if, if-else-if, switch-case)	**(2 Labs)**
III	**Assignment 3rd**	
	• Looping program (for, while, do-while)	**(2 Labs)**
IV	**Assignment 4th**	
	• Program based on array (one, two, three dimensions)	**(2 Labs)**
V	**Assignment 5th**	
	• Program using Structure and Union	**(2 Labs)**
VI	**Assignment 6th**	
	• Program using Functions(with or without recursion)	**(2 Labs)**
VII	**Assignment 7th**	
	• Program using Pointers(with Functions)	**(3 Labs)**
VIII	**Assignment 8th**	
	• Program using File Handling.	**(2 Labs)**
		Total Labs Req: 18

BET 212 MECHANICAL ENGINEERING LAB

Teaching Hrs. **Exam Hrs. – 3 Hrs.**
L-0 T-0 P-2 **Marks Sessional-30 Practical – 20 Total 50**

S. No.	List of Experiments
I	Study of 2-stroke Petrol Engine.
II	Study of 2-stroke Diesel Engine.
III	Study of 4-stroke Petrol Engine.
IV	Study of 4-stroke Diesel Engine.
V	Study of various types of Low Pressure Steam Generators.
VI	Study a Window type Air Conditioner
VII	Study a vapour absorption type Refrigerator.
VIII	Study of Reciprocating Compressor.
IX	To establish the relation between saturation temperature and pressure for steam and to compare the results with standard values.
X	To study various mechanical drives (Belt, Chain and Gear).
XI	To study various Shaft Couplings.

BET 213 MACHINE DRAWING

Teaching Hrs. **Exam Hrs. – 3 Hrs.**
L-0 T-0 P-3 **Marks Sessional-30 Practical – 20 Total 50**

CONTENTS OF SYLLABUS

S. No.	Details of Coverage
I	• Introduction to machine drawing. • Orthographic projections: First and third angle methods; Free hand sketching. • Dimensioning: Locations and placing.
II	• Orthographic Projections (Sheet). • Sectional Views (Sheet).
III	• Riveted joints; Screw fasteners; Different types of threads, thread profiles, nuts and bolts; Locking devices; Set screws; Foundation bolts (Sheet).
IV	• Bearing: foot step bearing (Sheet).
V	• Introduction to Auto CAD.

List of free hand sketches

- Different type of lines.
- Conventional representation of materials.
- Riveted joints; Lap joints; Butt joints; Chain riveting; Zig-zag riveting.
- Conventional representation of threads (without section and with section).
- Coupling: Flange and pin type flexible coupling.
- Welded joints.
- Pulleys.

Total Labs Required: 14

Reference Books:

1. Machine Drawing by N.D.Bhatt; Charotar Publishing House.
2. Machine Drawing by P. S. Gill; K. Kataria & Sons
3. A text book of Machine Drawing by Lakshminarayanan Mathur; S. Chand & Company Ltd.
4. Machine drawing by K.R. Gopal Krishna; Subhas Publications.