DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

CIRCULAR NO. SU/Sci./B.Sc. Syll./38/2015

It is hereby inform to all concerned that, on the recommendation of the various Board of Studies, Ad-hoc Boards & Committees, the Hon'ble Vice-Chancellor has accepted the revised semester-wise syllabi on behalf of the Academic Council under Section-14[7] of the Maharashtra Universities Act, 1994 in the Faculty of Science as under :-

Sr. No.	Name of the Subject	Semester
[1]	B.Sc. Polymer Chemistry IIInd Year, [Optional]	V & VI
[2]	B.Sc. Networking and Multimedia IIInd Year, Three Year Degree Course	V & VI
[3]	B.Sc. Dry Land Agriculture IInd Year, [Optional]	III & IV
[4]	B.Sc. Sericulture IInd Year, [Optional]	III & IV
[5]	B.Sc. Workshop Technology IInd Year, Three Year Degree Course	III & IV
[6]	M.Sc. Botany IInd Year [at college level]	III & IV

This is effective from the Academic Year 2015-16 & onwards as appended herewith.

All concerned are requested to note the contents of the circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF. NO. ACAD/ SU / SCI./ 2015/
Date:- 28-07-2015.

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Director,
Board of College and University Development.

Copy forwarded with compliments to:-

1] The Principals, affiliated concerned colleges,
Dr. Babasaheb Ambedkar Marathwada University

Copy to :-

1] The Controller of Examinations,
2] The Director, [E-Suvidha Kendra], in-front of Registrar's Quarter, Dr. Babasaheb Ambedkar Marathwada University,
3] The Superintendent, [B.Sc. Unit],
4] The Superintendent, [M.Sc. Unit],
5] The Superintendent, [B.C.S. Unit],
6] The Programmer [Computer Unit-1] Examinations,
7] The Programmer [Computer Unit-2] Examinations,
8] The Record Keeper.
Dr. Babasaheb Ambedkar Marathwada University.

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S*/-030815/-

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

SYLLABUS OF
B.SC. (WORKSHOP TECHNOLOGY)

SECOND YEAR

THIRD & FOURTH SEMESTER

Dr. R.R. Deshmukh

THIRD SEMESTER

Paper no.	Name of Paper	Weekly Teaching Scheme		Scheme of Examinations		Total Mark
		Theory	Practical	Theory	Practical	
BMPXV	Production Management	3	--	50	--	50
BMPXVI	Mechanical Measurement	3	3	50	50	100
BMPXVII	Machine Drawing-I	3	3	50	50	100
BMPXVIII	Applied Thermodynamics	3	3	50	50	100
BMPXIX	Manufacturing Process-I	3	3	50	50	100
BMPXX	Machine Tool Technology	3	3	50	50	100
BMPXXI	Project report based on paper XV	--	3	--	50	50
	Total	**18**	**18**	**300**	**300**	**600**

FOURTH SEMESTER

Paper no.	Name of Paper	Weekly Teaching Scheme		Scheme of Examinations		Total Mark
		Theory	Practical	Theory	Practical	
BMPXXII	Industrial Organization and Management	3	--	50	--	50
BMPXXIII	Electrical Technology	3	3	50	50	100
BMPXXIV	Machine Drawing – II	3	3	50	50	100
BMPXXV	Strength of Materials	3	3	50	50	100
BMPXXVI	Manufacturing Process -II	3	3	50	50	100
BMPXXVII	Heat Transfer	3	3	50	50	100
BMPXXVIII	Project report based on paper XXII	--	3	--	50	50
	Total	**18**	**18**	**300**	**300**	**600**

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD.

APPENDIX – 'A'

B.SC. (WORKSHOP TECHNOLOGY)
SECOND YEAR

R-1878 : The following shall be the scheme of examination of the Course.

THIRD SEMESTER

Paper no.	Name of Paper	Scheme and Pattern of Examination							
		Teaching Scheme Periods (1 Hr.)			Examination		Min. Marks for Passing		Total Mark
		Theory Per week	Pract. Per week	Total	Theory	Pract.	Theory	Pract.	
BMPXV	Production Management	3	--	3	50	--	20		50
BMPXVI	Mechanical Measurement	3	3	6	50	50	20	20	100
BMPXVII	Machine Drawing-1	3	3	6	50	50	20	20	100
BMPXVIII	Applied Thermodynamics	3	3	6	50	50	20	20	100
BMPXIX	Manufacturing Process-1	3	3	6	50	50	20	20	100
BMPXX	Machine Tool Technology	3	3	6	50	50	20	20	100
BMPXXI	Project report based on paper XV	--	3	3	--	50		20	50
	Total	**18**	**18**	**36**	**300**	**300**			**600**

Total Marks 300+300=600

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD.

APPENDIX – 'A'

B.SC. (WORKSHOP TECHNOLOGY)
SECOND YEAR

The following shall be the scheme of examination of the Course.

FOURTH SEMESTER

Paper no.	Name of Paper	Scheme and Pattern of Examination							
		Teaching Scheme Per week Periods (1 Hr.)			Examination		Min. Marks for passing		Total Mark
		Theory	Pract.	Total	Theory	Pract.	Theory	Pract.	
BMPXXII	Industrial Organization and Management	3		3	50	--	20	--	50
BMPXXIII	Electrical Technology	3	3	6	50	50	20	20	100
BMPXXIV	Machine Drawing – II	3	3	6	50	50	20	20	100
BMPXXV	Strength of Materials	3	3	6	50	50	20	20	100
BMPXXVI	Manufacturing Process – II	3	3	6	50	50	20	20	100
BMPXXVII	Heat Transfer	3	3	6	50	50	20	20	100
BMPXXVIII	Project report based on paper XXII	-	3	3	--	50	--	20	50
Total		**18**	**18**	**36**	**300**	**300**	--	--	**600**

Total marks 300 + 300 = 600

R.1879: The Maximum number of students in a class for theory shall be 80
Maximum number of students in a batch for practicals at the first and second year shall consist of 16 students and at third year the batch shall consist of 10 students.

R.1880(a): A candidate who has passed the B.Sc Workshop Technology [Manufacturing Process] (Vocational) examination of this university may be allowed to present himself subsequently at a Degree examination in a subject or subjects other than those he has taken earlier provided that he puts in three years or attendance as a regular candidate for First, Second and Third year in the subject or subjects concerned excluding compulsory English, Second language and remaining optional subject[s].
A candidate shall not be allowed to appear for such examination if he has passed the higher examination.

(b): When a candidate appears for all the subjects present at the examination without availing himself of the benefit of exemptions and passes the B.Sc Workshop Technology [Manufacturing Process] (Vocational) examination shall be awarded the degree in the faculty and shall also be entitle to B.Sc [Manufacturing Process] (Vocational) examination and appearing subsequently with a change of subject or subject shall be simply declared to have passed in the subject or subjects concerned and e shall not be eligible for the award of another degree.

R.1881: ATKT rules. A candidate who has failed in not more than 25% of the papers (theory and practical taken together) at the first year examination shall be allowed to keep terms for the second year. He shall be permitted to clear those papers before or along with Second year examination. A candidate who has failed in not more than 25% of the papers (theory and practical taken together) at the Second year examination and has passed the First year examination completely shall be allowed to keep terms for the third year. His result of the Third year examination shall not be declared unless he passes the Second Year examination.
Any fraction, while calculating 25% of the papers prescribed shall be ignored and rounded up to higher value.

Standard of Passing:

R.1882(a): Standard of Passing :- The minimum marks for passing in each paper / practical shall be 35% of the maximum marks prescribed of each paper / Practicals. A candidate who secures 35% or more but less than 45% of the aggregate marks of theory and practical taken together for all the three years of the course shall be awarded a pass Division.

(b):
A candidate who secures 45% or more but less than 60% of the aggregate marks of theory and practicals taken together for all the three years of the course shall awarded a Second division.

I:
A candidate who secures 60% or more but less than 75% of the aggregate marks of theory and practicals taken together for all the three years of the course shall awarded a First Division.

(d):
A candidate who secures 75% or more of the aggregate marks of theory and practicals taken together for all the three years of the course shall awarded a First class with Distinction.

O 878. Admission eligibility for Bsc (Mfg.Process)
For Admission To Direct Second year -
Passed Three years Diploma in Engineering With any branch.
Passed First year B Sc. Automobile Maintenance/Ref. and Air Cond.(RAC)

BMPXV- Production Management

Teaching Scheme Hours		Evaluation Scheme				Duration for Exam	
Th.	Pr.	Th. Ex.	PR	TW	Total	Theory	Practical
40	---	50	--	50	100	Two Hrs.	-

1. Introduction- **(04)**

Concept of production, types of production, Functions of production planning and control.

2. Product Development and Design- **(10)**

Company policy, effect of competition on design, product analysis marketing functional, operational aspects, durability and dependability, economic analysis, profit consideration, effect of simplification standardization, specification, B.E.P (Break Even Point)

3. Factory Planning - **(09)**

Site selection, Plant layout Definition, objective, flow system types of layout.

4. Material Handling- **(09)**

Need for reduction of material handling, equipment for material handling classification and working, selection of material handling equipments.

5. Material Management- **(08)**

Concept, Purchasing, purchase organization, buying technique, quality and quality standards, purchasing procedure accounting, stores and material control receipts and issue of materials, store records.

Practical:-

Five assignments on above topics covering each chapter.

Reference:

i) Modern production / operation management – Buffs
ii) Industrial Engineering and management – O.P. Khanna
iii) Production planning and control -Simeul

BMPXVI -Mechanical Measurements

Teaching Scheme Hours		Evaluation Scheme				Duration for Exam	
Th.	Pr.	Th. Ex.	PR	TW	Total	Theory	Practical
40	30	50	50	-	100	Two Hrs.	Three Hrs.

1. General Configuration of Mechanical Measurements- (04)

Introduction functional elements of measuring instruments ,static characteristics of instruments, dynamic characteristic .General mathematical of zero order, first order, second order instruments.

2. Pressure, Strain and Force Measurements- (12)

Introduction, pressure measuring instruments – Burder pressure gauge, diaphragm,, Knudsen gauge, Thermal conductivity gauge.
Strain measuring instruments, strain gauge, Types ,use of strain gauges on rotating shafts, calibration and testing.
Force measurement: Hydraulic, pneumatic and Electrical methods.

3. Temperature Measurement- (12)

Introduction, Thermal expansion methods-bimetallic thermometer, liquid in glass thermometer ,thermo electric sensors. common thermo couples, reference junction consideration.

4. Measurement of Speed- (12)

Introduction, Angular speed measurement, mechanical and Electrical tachometer, Inductive, capacitive and photoelectric pickup ,stroboscope.

Practicals-

(i) Study of generalized measurement system with instrument.
(ii) Force measurement: load cell, Spring balance.
(iii)Study and demonstration of use of thermo couple, Resistance thermometer.

Reference Books:-

i) Mechanical measurement and instrumentation by Doebelin
ii) Mechanical measurement by Siroho
iii) Introduction to Mechatronics and measurement system by David G
iv) Industrial Hydraulic and Pneumatic- Andrew Perr.

BMPXVII - MACHINE DRAWING-I

Teaching Scheme Hours		Evaluation Scheme				Duration for Exam	
Th.	Pr.	Th. Ex.	PR	TW	Total	Theory	Practical
40	30	50	50	-	100	Two Hrs.	Three Hrs.

1. Screw Threads- **(05)**

Introduction, nomenclature of threads ,form of thread – V thread, square thread, conventional representation of threads

2. Screwed Fastening- **(05)**

Introduction, types of nuts and bolts, method of preventing rotation of a bolt while screwing a nut on or off it, locking arrangement of nut, function of bolt

3. Keys, Cotter, Joints , Pin Joints- **(10)**

Introduction, keys joint, cotter and cotter joint, pin joint

4. Riveted Joints and Welded Joints- **(10)**

Introduction, riveting, forms and proportions of rivet heads, failure of a riveted joint, types of riveted joints, welded joints, types of welding process

5. Shaft Couplings, Clutches and Brakes- **(10)**

Introduction, classification of couplings, clutches and their types, brakes and their classification

Practicals-

(i) Drawing sheet practice on each chapter (Min. Two Sheets)

Reference-

(i) Machine Drawing by N.D Bhatt
(ii) Machine Drawing by P.S. Gill

BMPXVIII -Applied Thermodynamics

Teaching Scheme Hours		Evaluation Scheme				Duration for Exam	
Th.	Pr.	Th. Ex.	PR	TW	Total	Theory	Practical
40	30	50	50	-	100	Two Hrs.	Three Hrs.

1. Air Standard Cycles- (06)

Need, Assumptions, Carnot cycle and its limitations, Otto cycle, Diesel cycle and dual cycle with representation on P-V and T-S Planes, comparison and mathematical analysis for efficiency, mean effective, pressure and power output, Introduction tp sterling , Erickson and Brayton cycle, Numerical on above cycles.

2. Vapor Power Cycle- (05)

Simple steam power cycle, Rankine and modified rankine cycle, Actual vapour power cycle processes, Reheat cycle, Actual vapour power cycle processes, Reheat cycle, Ideal regenerative cycle, Regenerative cycle, Reheat regenerative cycle, Applications of vapor power cycle and numerical on above.

3. Internal Combustion Engines- (10)

Construction, Classification, Working of two stroke and four stroke S.I. and C.I. enfines with P-V and T-S plane, comparison of two stroke and four stroke engines, comparison of petrol and Diesel engines, engine efficiencies, Thermal efficiency, Mechanical efficiency, volumetric efficiency, relative efficiency preparation of heat balance sheet, Numerical on above.

4. Reciprocating Air Compressor- (10)

Introduction, Classification, Construction of single stage reciprocating air compressor, multistage reciprocating air compressor, efficient of compressor, Intercooler, Optimum condition for minimum power, Intercooling method, Applications of compressed air, comparison of different types of compressors, Numerical on above.

5. Non Conventional Power Generation System- (09)

(i) Solar power plants : Solar energy, solar Collector - Flat plate collector, analysis, concentric collector and its tyoes, Solar pond technology, Solar electric power plants, Solar power plant
(ii) Geothermal Power plant: Geothermal energy, Sources, Advantages.
(iii) Additional alternate energy sources & Magneto Hydro Dynamic MHD power generation i) Introduction. ii) Principles of MHD power generation iii) MHD system iv) MHD design problems and developments

Practical-

(i) One Assignment on above each topics.

References-

(i) Thermal Engineering by Domkundwar
(ii) Thermal Engineering by P.K.Nath

BMPXIX -Manufacturing Process - I

Teaching Scheme Hours		Evaluation Scheme				Duration for Exam	
Th.	Pr.	Th. Ex.	PR	TW	Total	Theory	Practical
40	30	50	50	-	100	Two Hrs.	Three Hrs.

1. Concepts of Manufacturing Process- (05)

Introduction, concepts, classification of manufacturing process.

2. Introduction to Pattern Making- (08)

Pattern material, tools and equipments, master pattern, pattern making, classification, allowances.

3. Moulding- (10)

Introduction, molding material, types, characteristics, core, types, molding process.

4. Casting- (08)

Basic principle, gate and its types, furnace and its types, characteristics casting defects, casting process. Casting methods.

5. Powder Metallurgy- (09)

Introduction, process, production of metal powder – atomization, reduction, electrolysis : milling, grinding, shooting, machining, characteristics of metal powder application.

Practicals-

(i) Study of pattern making tools. (one job of pattern making)
(ii) Study of molding process.
(iii) Study of powder metallurgy process.

Reference Books-

(i) Workshop Technology Vol – I - B.S. Raghuwanshi
(ii) Production Technology - R.K. Jain
(iii) Principles of metal casting. - Richard W. Hiene, C.R. Loper, P.C. Resenthan

BMPXX - Machine Tool Technology

Teaching Scheme Hours		Evaluation Scheme				Duration for Exam	
Th.	Pr.	Th. Ex.	PR	TW	Total	Theory	Practical
40	30	50	50	-	100	Two Hrs.	Three Hrs.

1. **Introduction to machine tool:** concept, classification of machine tool, General purpose, special purpose, NC, CNC on the basis of kinematics, force and power required for various metal cutting operation. **(04)**

2. **Drives-** **(10)**

   Introduction, common means of drives, Types, selection of motor for the drive, Regulation and range of speed based on preferred number/series/geometric progression

3. **Elements of Machine Tools-** **(09)**

   Designs of beds, slide ways, carriage, tables of lathes, milling machine based on forces, frictional behaviors and different types of lubrications system power screws

4. **Control System-** **(09)**

   Electrical control, Hydraulic control in machine tools, control system for gear in machine tools. Control systems for gear shifting and feed mechanism for NC/CNC machine tools

5. **Step Less Regulation-** **(08)**

   Electro mechanical system of regulation, friction, pressure and ball variators

Practical

(i) Any six assignments on the above topics.

References

(ii) Machine tool design - Mehta N.K.
(ii) Design of machine tools - Pal D.K. and Basu S. K.
(iii) Principles of machine tools - Bhattacharya A. and sen G.C.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

SYLLABUS OF

B.SC. (WORKSHOP TECHNOLOGY)

SECOND YEAR

FOURTH SEMESTER

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD.

APPENDIX – 'A'

B.SC. (WORKSHOP TECHNOLOGY)
SECOND YEAR

FOURTH SEMESTER

Paper no.	Name of Paper	Scheme and Pattern of Examination							
		Teaching Scheme Per week Periods (1 Hr.)			Examination		Min. Marks for passing		Total Mark
		Theory	Pract.	Total	Theory	Pract.	Theory	Pract.	
BMPXXII	Industrial Organization and Management	3		3	50	--	20	--	50
BMPXXIII	Electrical Technology	3	3	6	50	50	20	20	100
BMPXXIV	Machine Drawing – II	3	3	6	50	50	20	20	100
BMPXXV	Strength of Materials	3	3	6	50	50	20	20	100
BMPXXVI	Manufacturing Process – II	3	3	6	50	50	20	20	100
BMPXXVII	Heat Transfer	3	3	6	50	50	20	20	100
BMPXXVIII	Project report based on paper XXII		3	3	--	50	--	20	50
	Total	18	18	36	300	300	--	--	600

Total marks 300 + 300 = 600

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD.

APPENDIX – 'A'
B.SC. (WORKSHOP TECHNOLOGY)
SECOUND YEAR

The following shall be the scheme of examination of the Course.

FOURTH SEMESTER

Paper no.	Name of Paper	Scheme and Pattern of Examination							
		Teaching Scheme Per week Periods (1 Hr.)			Examination		Min. Marks for passing		Total Mark
		Theory	Pract.	Total	Theory	Pract.	Theory	Pract.	
BMPXXII	Industrial Organization and Management	3		3	50	--	20	--	50
BMPXXIII	Electrical Technology	3	3	6	50	50	20	20	100
BMPXXIV	Machine Drawing – II	3	3	6	50	50	20	20	100
BMPXXV	Strength of Materials	3	3	6	50	50	20	20	100
BMPXXVI	Manufacturing Process – II	3	3	6	50	50	20	20	100
BMPXXVII	Heat Transfer	3	3	6	50	50	20	20	100
BMPXXVIII	Project report based on paper XXII		3	3	--	50	--	20	50
	Total	**18**	**18**	**36**	**300**	**300**	--	--	**600**

Total marks 300 + 300 = 600

BMPXXII - Industrial Organization and Management

Teaching Scheme Hours		Evaluation Scheme				Duration for Exam	
Th.	Pr.	Th. Ex.	PR	TW	Total	Theory	Practical
40	---	50	-	50	100	Two Hrs.	-

1. Ownership and Entrepreneurship Development- (10)

Individual, Partnership, joint stock companies, co-operative, public sectors and government undertakings, differences, comparison, merits. Project and feasibility reports, licensing, Scale of Industry – small, medium and large, registration and other formalities. Excise and relevant taxation. Procurement of power Water and other facilities.

2. Finance- (09)

Sources, raising of finances, Banks, Financial Institutions leasing institution, Shares debentures, loans, credits, convertible bonds. Cost account and control, Prime cost, elements of cost, Break even chart, budget and budgetary control, Profit and loss account, Balance sheet.

3. Site Selection and Plant Layout- (07)

Factors affecting selection economic survey of site selection. Functional layout, product layout mixed layout, advantages and disadvantages.

4. General Functions in Industries- (08)

Procuring or buying, inspections, storing production material handling, packing and forwarding, marketing, supervision, different systems of the above functions. There advantages and disadvantages equipment necessary to carry out these functions.

5. Act. (06)

Boiler Act, Electricity Act, Factory Act, EST Act, Compensation Act.

Practicals:

(i) Assignments based on above topics

References:

(i) Industrial Organization and management :- O.P. Khanna
(ii) Production Management - Martand

BMPXXIII -Electrical Technology

Teaching Scheme Hours		Evaluation Scheme				Duration for Exam	
Th.	Pr.	Th. Ex.	PR	TW	Total	Theory	Practical
40	30	50	50	-	100	Two Hrs.	Three Hrs.

1. **Basics in Electricity-** **(07)**
   Introduction, flow on current, laws pf electricity, A.C. and D.C., single phase and three phase.

2. **Transformer-** **(07)**
   Introduction, Basic concepts, working principle, construction and application.

3. **A.C. and D.C. Motors-** **(10)**
   Introduction, types, construction and working, application.

4. **Magnetic Circuits-** **(06)**
   Reluctance, MMF, magnetic field strength, series and parallel magnetic circuits.

5. **Electrical Measuring Instruments-** **(10)**
   Introduction, concepts classification and application.

Practicals-

(i) Study of various electrical measuring instruments.
(ii) Study of A.C. and D.C. Motors.
(iii) Study of Transformers.
(iv) Study of magnetism.

References-

(i) Electrical Technology Vol- I & II - B.L.Thereja.
(ii) Basic Electrical Engineering - J.B.Gupta
(iii) Basic Electrical Engineering - Thatte V.N.

BMPXXIV -Machine Drawing – II

Teaching Scheme Hours		Evaluation Scheme				Duration for Exam	
Th.	Pr.	Th. Ex.	PR	TW	Total	Theory	Practical
40	30	50	50	-	100	Two Hrs.	Three Hrs.

1. Pulleys- (08)

Introduction, classification, C.I. belt pulley, fast and loose pulley, stepped pulley, split pulley, built up pulley, rope pulley, V-belt pulley.

2. Spur Gear- (08)

Introduction, nomenclature, tooth proportions, In volute spur gear, approximate construction of teeth profile, cycloid tooth profile.

3. Engine Parts- (12)

Introduction, steam engine, cylinder cover, piston stuffing boxes, cross heads, connecting rod, crank, slide valve, internal combustion engine different parts.

4. Assembly Drawings- (12)

Introduction, types of assembly drawing, accepted norms to be observed for assemble drawing sequence of preparing the assembly drawing.

Practical- Practical Drawing Sheet based on above topics (Minimum 5)

References-

(i) Machine Drawing - N.D. Bhatt
(ii) Machine Drawing - Gill

BMPXXV- Strength of Materials

Teaching Scheme Hours		Evaluation Scheme				Duration for Exam	
Th.	Pr.	Th. Ex.	PR	TW	Total	Theory	Practical
40	30	50	50	-	100	Two Hrs.	Three Hrs.

1. Simple Stress and Strains- **(12)**

Various types of stress, Hook's law, young's modulus, poissen ration, strain, stress-strain diagram, temperature stresses and strain elastic constant, relation between young's modulus, shear modulus and bulk modulus.

2. Shear Force and Bending Moment- **(08)**

Concepts of shear force and bending moment, S.F. and B.F. diagram for various load.

3. Stresses in Beam- **(10)**

Theory of simple bending, sagging hogging bending moment, bending stress, bending stress distribution diagram for various cross sectional diagram.

4. Shear Stress- **(08)**

Basic concepts, shear stress , distribution diagram for various sections.

Practicals- Practical based on above topics (Minimum 5)

References-

(i) Strength of material - Ramamurthy
(ii) Strength of material - R.R.Rajput
(iii) Strength of material - R.S.Lehurmi
(iv) Strength of material - F.L.Singer.

BMPXXVI -Manufacturing Process – II

Teaching Scheme Hours		Evaluation Scheme				Duration for Exam	
Th.	Pr.	Th. Ex.	PR	TW	Total	Theory	Practical
40	30	50	50	-	100	Two Hrs.	Three Hrs.

1. Metal Forming- (10)

Stress strain relation in elastic and plastic deformation , concept of flow stress deformation, mechanism, difference in hot working and cold working. Extrusion and types, piercing, pipe and tube production manufacture of seamless pipe and tubing.

2. Plastics and Their Processing- (10).

Introduction – polymers and classification, plastic processing methods, plastic fabricating method, application.

3. Cleaning, Finishing and Coating of Metal Surfaces- (10)

Introduction, surface cleaning purpose, classification, selection of cleaning process, types of coating, conversion coating application, galvanizing – types and application.

4. Nontraditional Machining Process- (10)

Introduction, chemical machining, electro chemical machining, EDM, magneto abrasive finishing, abrasive flow machining laser beam machining. Advantages and disadvantages, application.

Practicals- Practical based on above topics (Minimum 5)

References:

(i) Modern manufacturing Process Engineering – Benjamin W NiebelAllen Draper
(ii) Nontraditional manufacturing process: - Garry F Beedict Marcel.
(iii) Production technology handbook: - H.M.T. Tata – Mc Grew Hill
(iv) Manufacturing Process: - B.H. Amsted Philip F Myron L
(v) Non conventional machining process: - P.K.Mishra.

BMPXXVII-HEAT TRANSFER

Teaching Scheme Hours		Evaluation Scheme				Duration for Exam	
Th.	Pr.	Th. Ex.	PR	TW	Total	Theory	Practical
40	30	50	50	-	100	Two Hrs.	Three Hrs.

1. **Basic Concepts-** **(10)**
   Introduction, general aspects, importance of heat transfer, modes of heat transfer, heat transfer by conduction, convection and radiation.

2. **Heat Exchanger-** **(08)**
   Introduction, types of heat exchanger, evaporator, types of evaporators, applications.

3. **Boiling and Condensation-** **(10)**
   Introduction, boiling heat transfer, boiling co-relation, condensation and heat transfer, film condensation.

4. **Mass Transfer-** **(12)**
   Introduction, modes of mass transfer, Ficks Law, convective mass transfer, concentration velocity and fluxes.

Practicals- Practical based on above topics (Minimum 5)

References-

(i) Heat and Mass Transfer by R.K. Rajput.