



Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur 440033

Scheme and Syllabus for
Bachelor of Technology in Mechanical Engineering

Submitted by
Board of Studies in Mechanical Engineering

Vision:

Developing technocrats in Mechanical Engineering with computational and design skills, leadership and industrial practices, meeting the Global requirements of industry / business and society.

Mission:

- Developing Quality Mechanical Engineering graduates by imparting theoretical and practical knowledge with the exposure to work practices in Industry and Business.
- Develop graduates with over all personality, communication skills, computational skills and managerial skills with ethics to fulfill the expectations of the Industry and Society.
- Providing Opportunities to practice industrial processes, pursue higher studies and entrepreneurship skills for sustainable growth

Program Educational Objectives (PEOs):

PEO1: Graduates shall have good technical competency to take up industrial projects / responsibilities as per the national and global requirements for enriched employability.

PEO2: Graduates shall design and develop innovative products / systems through application of mechanical and allied engineering knowledge, multidisciplinary exposure, computing skills and to acquire lifelong learning skills to pursue higher studies and research.

PEO3: Graduate shall work successfully as leader or as a part of the team on multidisciplinary project and undertake consultancy and entrepreneurship as their career option

PROGRAM OUTCOMES (POs)

PO1: Engineering Knowledge::Apply the knowledge of mathematics, science, engineering fundamentals, and engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate and analyze hardware and software engineering problems and arrive at substantiated conclusions using first principles of mathematics, natural and engineering sciences.

PO3. Design/Development of solutions: Design and develop hardware / software system to meet desired needs within realistic constraints related to economic, environmental, social, political, ethical, health and safety, verifiability, and sustainability concerns.

PO4. Conduct investigations of complex problems: Use research based knowledge including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Use techniques, skills, and modern computer engineering tools, including simulation and modeling, for addressing the needs of engineering profession and interdisciplinary business.

PO6. The engineer and society: Understand the computing needs of inter-disciplinary scientific and engineering disciplines and design and develop algorithms and techniques for societal, health, safety, legal and cultural problems.

PO7. Environment and sustainability :Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function as member or leader of team and to understand engineering management principles & finance to manage projects in multidisciplinary environment.

PO10. Communications:

Effectively transfer technology to engineering community and society at large on broadly defined engineering needs through technical reports, presentations and software technologies.

PO11. Project management and finance:

Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

PO12. Life-long learning: Engage in lifelong learning and adapt to rapid changes in computer science & allied areas.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Acquire and apply knowledge in various domains like Design, Thermal, Production and allied areas through theory / practical / industrial visits

PSO2: Acquire engineering knowledge, computational, management, soft skills and entrepreneurship skills for the betterment of industrial and social requirement

Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur
Faculty of Science & Technology
Scheme of Examination and Evaluation
Bachelor of Technology (Mechanical Engineering) (Choice Based Credit System)
I Semester B. Tech (Mechanical Engineering)

I Semester B. Tech (Mechanical Engineering)																	
Sr No	Course Code	Category	Course Title	Teaching Scheme			Credits	Examination Scheme									
				L	T	P		Theory					Practical				
								Duration of Exam (Hrs)	Max. Marks College Assessment	Max. Marks University Assessment	Total Marks	Min. Passing Marks	Max. Marks College Assessment	Max. Marks University Assessment	Total Marks	Min. Passing Marks	
1		Basic Science course	Mathematics - I	3	1	-	4	3	30	70	100	45	-	-	-	-	
2		Basic Science course	Applied Physics	3	1	-	4	3	30	70	100	45	-	-	-	-	
3		Engineering Science Courses	Engineering Graphics	1	-	-	1	2	15	35	50	23	-	-	-	-	
4		Engineering Science Courses	Energy & Environment	3	-	-	3	3	15	35	50	23	-	-	-	-	
5		Humanities, Social Sciences & Management courses	Communication & Aptitude Skills	2	-	-	2	-	15	35	50	23	-	-	-	-	
6		Engineering Science Courses	Basics of Civil & Mechanical	4	-	-	Audit (0)	-	50	-	50	-	-	-	-	-	
7		Basic Science course	Applied Physics Lab	-	-	2	1	-	-	-	-	-	25	25	50	25	
8		Engineering Science Courses	Engineering Graphics Lab	-	-	4	2	-	-	-	-	-	25	25	50	25	
9		Engineering Science Courses	Energy & Environment Lab	-	-	2	1	-	-	-	-	-	25	25	50	25	
10		Humanities, Social Sciences & Management courses	Communication Skills Lab	-	-	2	1	-	-	-	-	-	25	25	50	25	
11		Mandatory Course	Induction Program	Three Weeks			-	-	-	-	-	-	-	-	-	-	
Total				16	2	10	-	-	155	245	400	-	100	100	200	-	
Semester Total				28			19	Marks 600									

Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur
Faculty of Science & Technology
Scheme of Examination and Evaluation
Bachelor of Technology (Mechanical Engineering) (Choice Based Credit System)
II Semester B. Tech (Mechanical Engineering)

II Semester B. Tech (Mechanical Engineering) (Choice Based Credit System)																
Sr No	Course Code	Category	Course Title	Teaching Scheme (Hours/Week)			Credits	Examination Scheme								
				L	T	P		Theory					Practical			
								Duration of Exam (Hrs)	Max. Marks College Assessment	Max. Marks University Assessment	Total Marks	Min. Passing Marks	Max. Marks College Assessment	Max. Marks University Assessment	Total Marks	Min. Passing Marks
1		Basic Science course	Mathematics -II	3	1	-	4	3	30	70	100	45	-	-	-	-
2		Basic Science course	Applied Chemistry	3	1	-	4	3	30	70	100	45	-	-	-	-
3		Engineering Science Courses	Advance Engineering Materials	3	-	-	3	2	15	35	50	23	-	-	-	-
4		Engineering Science Courses	Engineering Mechanics	2	-	-	2	2	15	35	50	23	-	-	-	-
5		Engineering Science Courses	Basic Electrical Engineering	2	-	-	2	2	15	35	50	23	-	-	-	-
6		Engineering Science Courses	Computational Skills	2	-	-	2	2	15	35	50	23	-	-	-	-
7		Basic Science course	Applied Chemistry Lab	-	-	2	1	-	-	-	-	-	25	25	50	25
8		Engineering Science Courses	Advance Engineering Materials Lab	-	-	2	1	-	-	-	-	-	25	25	50	25
9		Engineering Science Courses	Workshop Practices	-	-	4	2	-	-	-	-	-	25	25	50	25
10		Engineering Science Courses	Computational Skills Lab	-	-	2	1	-	-	-	-	-	25	25	50	25
11		Mandatory Course	Indian Culture and Constitution	2	-	-	Audit (0)	-	-	-	-	-	25	25	50	25
Total				17	2	10	-	-	120	280	400	-	100	100	200	-
Semester Total				29			22	Marks 600								

Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur
Faculty of Science & Technology
Scheme of Examination and Evaluation
Bachelor of Technology (Mechanical Engineering) (Choice Based Credit System)
III Semester B. Tech (Mechanical Engineering)

III Semester B. Tech (Mechanical Engineering)																
Sr No	Course Code	Category	Course Title	Teaching Scheme (Hours/Week)			Credits	Examination Scheme								
				L	T	P		Theory					Practical			
								Duration of Exam (Hrs)	Max. Marks College Assessment	Max. Marks University Assessment	Total Marks	Min. Passing Marks	Max. Marks College Assessment	Max. Marks University Assessment	Total Marks	Min. Passing Marks
1	BEME301T	Basic Science course	Applied Mathematics – III	3	-	-	3	3	30	70	100	45	-	-	-	-
2	BEME302T	Professional core courses	Manufacturing Processes	3	-	-	3	3	30	70	100	45	-	-	-	-
3	BEME302P	Professional core courses	Manufacturing Processes Lab	-	-	2	1	-	-	-	-	-	-	-	-	-
4	BEME303T	Professional core courses	Fluid Mechanics	3	-	-	3	3	30	70	100	45	-	-	-	-
5	BEME304T	Professional core courses	Kinematics of Machines	3	-	-	3	3	30	70	100	45	-	-	-	-
6	BEME305P	Professional core courses	Machine Drawing & Solid Modelling	-	1	2	2	-	-	-	-	-	-	-	-	-
7	BEME306T	Professional core courses	Material Science & Engineering	3	-	-	3	3	30	70	100	45	-	-	-	-
8	BEME307P	Project work, seminar and internship in industry or elsewhere	Skill Development (Basics of Computer aided drafting)	-	-	2	1	-	-	-	-	-	50	-	50	25
9	BEME308P	Mandatory Course	Sports / Yoga / NSS/NCC	-	-	2	Audit (0)	College Assessment in Grades O, A, B, C (Evaluation is to be done out of 50 marks, Evaluation guidelines mentioned in the syllabus of concerned course)								
Total				15	1	8	-	-	150	350	500	-	125	75	200	-
Semester Total				24			19	Marks 700								

Marks 700

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Faculty of Science & Technology
Scheme of Examination and Evaluation
Bachelor of Technology (Mechanical Engineering) (Choice Based Credit System)
IV Semester B. Tech (Mechanical Engineering)

IV Semester B. Tech (Mechanical Engineering)																
Sr No	Course Code	Category	Course Title	Teaching Scheme (Hours/Week)			Credits	Examination Scheme								
				L	T	P		Theory					Practical			
								Duration of Exam (Hrs)	Max. Marks College Assesment	Max. Marks University Assessment	Total Marks	Min. Passing Marks	Max. Marks College Assesment	Max. Marks University Assessment	Total Marks	Min. Passing Marks
1	BEME401T	Professional core courses	Machining Processes	3	-	-	3	3	30	70	100	45	-	-	-	-
2	BEME401P	Professional core courses	Machining Processes Lab	-	-	2	1	-	-	-	-	-	25	25	50	25
3	BEME402T	Professional core courses	Hydraulic Machines	3	-	-	3	3	30	70	100	45	-	-	-	-
4	BEME402P	Professional core courses	Fluid Mechanics & Hydraulic Machines Lab	-	-	2	1	-	-	-	-	-	25	25	50	25
5	BEME403T	Professional core courses	Mechanics of Materials	3	-	-	3	3	30	70	100	45	-	-	-	-
6	BEME403P	Professional core courses	Material Testing Lab	-	-	2	1	-	-	-	-	-	25	25	50	25
7	BEME404T	Professional core courses	Engineering Thermodynamics	3	-	-	3	3	30	70	100	45	-	-	-	-
8	BEME405P	Professional core courses	Computer Programming	-	1	2	2	-	-	-	-	-	25	25	50	25
9	BEME406T	Humanities & Social Science	Professional Ethics	3	-	-	3	3	30	70	100	45	-	-	-	-
10	BEME407P	Project work, seminar and internship in industry or elsewhere	Skill Development (Training on Matlab)	-	-	2	1	-	-	-	-	-	50	-	50	25
TOTAL				15	1	10	-	-	150	350	500	-	150	100	250	-
Semester Total				26			21	Marks 750								




Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur

Faculty of Science & Technology

Scheme of Examination and Evaluation

Bachelor of Technology (Mechanical Engineering) (Choice Based Credit System)

V Semester B. Tech (Mechanical Engineering)

**Industrial
Visit***

Visit to minimum TWO industries must be carried out by every student. Visit to be carried out in a batch of 6 students. Assessment should be based on Visit report and presentation.

Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur
Faculty of Science & Technology
Scheme of Examination and Evaluation
Bachelor of Technology (Mechanical Engineering) (Choice Based Credit System)
VI Semester B. Tech (Mechanical Engineering)

Sr No	Course Code	Category	Course Title	Teaching Scheme (Hours/Week)			Credits	Examination Scheme									
									Theory				Practical				
				L	T	P		Duration of Exam (Hrs)	Max. Marks College Assessment	Max. Marks University Assessment	Total Marks	Min. Passing Marks	Max. Marks College Assessment	Max. Marks University Assessment	Total Marks	Min. Passing Marks	
1	BEME601T	Professional core courses	Automation in Production	3	-	-	3	3	30	70	100	45	-	-	-	-	
2	BEME601P	Professional core courses	Automation in Production Lab	-	-	2	1	-	-	-	-	-	25	25	50	25	
3	BEME602T	Professional core courses	Energy Conversion-II	3	-	-	3	3	30	70	100	45	-	-	-	-	
4	BEME602P	Professional core courses	Energy Conversion Lab	-	-	2	1	-	-	-	-	-	25	25	50	25	
5	BEME603T	Professional core courses	Dynamics of Machines	3	-	-	3	3	30	70	100	45	-	-	-	-	
6	BEME603P	Professional core courses	Dynamics of Machines Lab	-	-	2	1	-	-	-	-	-	25	25	50	25	
7	BEME604T	Professional Elective courses	Elective - I	3	-	-	3	3	30	70	100	45	-	-	-	-	
8	BEME605T	Professional Elective courses	Elective - II	3	-	-	3	3	30	70	100	45	-	-	-	-	
9	BEME606T	Open Elective Course	Open Elective - I	3	-	-	3	-	30	70	100	45	-	-	-	-	
11	BEME607T	Mandatory Course	Environment Science	2	-	-	Audit (0)	College Assessment in Grades O, A, B, C (Evaluation is to be done out of 50 marks. Evaluation guidelines mentioned in the syllabus of concerned course)									
TOTAL				18	0	8	-	-	180	420	600		75	75	150	-	
Semester Total				26			21	Marks 750									
	Summer Internship**			Summer Internship should be undertaken after end of 6th Semester for a minimum duration of 4 weeks in Industry/ Research Institute/ Organizations & its evaluation to be done in 7th semester													

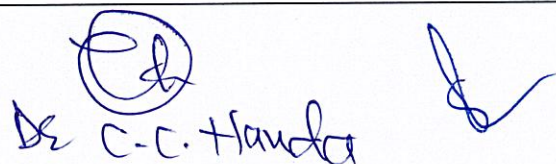
Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur
Faculty of Science & Technology
Scheme of Examination and Evaluation
Bachelor of Technology (Mechanical Engineering) (Choice Based Credit System)
VII Semester B. Tech (Mechanical Engineering)

VII Semester B. Tech (Mechanical Engineering) (Choice Based Credit System)																
Sr No	Course Code	Category	Course Title	Teaching Scheme (Hours/Week)			Credits	Examination Scheme								
				L	T	P		Theory					Practical			
								Duration of Exam (Hrs)	Max. Marks College Assessment	Max. Marks University Assessment	Total Marks	Min. Passing Marks	Max. Marks College Assessment	Max. Marks University Assessment	Total Marks	Min. Passing Marks
1	BEME701T	Professional Elective courses	Elective - III	3	-	-	3	3	30	70	100	45	-	-	-	-
2	BEME701P	Professional Elective courses	Elective - III Lab	-	-	2	1	-	-	-	-	-	25	25	50	25
3	BEME702T	Professional core courses	Energy Conversion III	3	-	-	3	3	30	70	100	45	-	-	-	-
5	BEME703T	Open Elective Course	Open Elective - II	3	-	-	3	3	30	70	100	45	-	-	-	-
6	BEME704T	Professional core courses	Design of Transmission systems	3	1	-	4	3	30	70	100	45	-	-	-	-
7	BEME705P	Project work, seminar and internship in industry or elsewhere	Summer Internship**	During Summer Vacation after sixth semester			2	-	-	-	-	-	50	-	50	25
8	BEME706P	Project work, seminar and internship in industry or elsewhere	Project Phase I	-	-	6	3	-	-	-	-	-	50	-	50	25
9	BEME707P	Project work, seminar and internship in industry or elsewhere	Employability Enhancement*	-	-	2	1	-	-	-	-	-	50	-	50	25
TOTAL				12	1	10	-	-	120	280	400	-	175	25	200	-
Semester Total				23			20	Marks 600								
Summer Internship**			Summer Internship should be undertaken after end of 6th Semester for a minimum duration of 4 weeks in Industry/ Research Institute/ Organizations & its evaluation to be done in 7th semester													
Employability Enhancement*			Students should be given training on Technical aptitude, General aptitude, Group Discussion, Interview Techniques to enhance their chances of employment													
Note: A load of 2 hours/week per project guide for the course "Project B"																

Note: A load of 2 hours/week per project guide for the course "Project Phase I"

Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur
Faculty of Science & Technology
Scheme of Examination and Evaluation
Bachelor of Technology (Mechanical Engineering) (Choice Based Credit System)
VIII Semester B. Tech (Mechanical Engineering)

Sr No	Course Code	Category	Course Title	Teaching Scheme (Hours/Week)			Credits	Examination Scheme								
				L	T	P		Theory					Practical			
								Duration of Exam (Hrs)	Max. Marks College Assessment	Max. Marks University Assessment	Total Marks	Min. Passing Marks	Max. Marks College Assessment	Max. Marks University Assessment	Total Marks	Min. Passing Marks
1	BEME801T	Professional core courses	Industrial Engineering	3	-	-	3	3	30	70	100	45	-	-	-	-
2	BEME802T	Professional Elective courses	Elective - IV	3	-	-	3	3	30	70	100	45	-	-	-	-
3	BEME802P	Professional Elective courses	Elective - IV Lab	-	-	2	1	-	-	-	-	-	25	25	50	25
4	BEME803T	Professional Elective courses	Elective - V	3	-	-	3	3	30	70	100	45	-	-	-	-
5	BEME804T	Professional Elective courses	Elective - VI	3	-	-	3	3	30	70	100	45	-	-	-	-
6	BEME805P	Project work, seminar and internship in industry or elsewhere	Project Phase II	-	-	12	6	-	-	-	-	-	100	100	200	100
TOTAL				12	0	14	-	-	120	280	400	-	125	125	250	-
Semester Total				26			19	Marks 650								
Note: A load of 4 hours/week per project guide for the course "Project Phase II"																


 Dr. C.C. Handa

Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur

Faculty of Science & Technology

Scheme of Examination and Evaluation

Bachelor of Technology (Mechanical Engineering) (Choice Based Credit System)

ELECTIVE I	ELECTIVE II	ELECTIVE III	ELECTIVE IV	ELECTIVE V	ELECTIVE VI	OPEN ELECTIVE I	OPEN ELECTIVE II
VI SEM	VI SEM	VII SEM (T+P)	VIII SEM (T+P)	VIII SEM	VIII SEM	VI SEM	VII SEM
Operation Research	Advanced Manufacturing Techniques	Mechatronics	Finite Element Method	Heating Ventilation & Air Conditioning	Industrial IOT	Entrepreneurship Development	Introduction to Electric Vehicles
Production Planning & Control	Power Plant Engineering	Computer Aided Design	Computer Integrated Manufacturing	Electric and Hybrid Vehicles	Additive Manufacturing	Automobile Engineering	Waste Management
Tool Design	Supply Chain Management	Advancements in Automobile Engineering	Refrigeration & Air conditioning	Design of Material Handling systems	Energy Conservation and Management	Project Evaluation & Management	Finance & Cost Management
Renewable Energy sources	Introduction to Artificial Intelligence	Computational Fluid Dynamics	CNC & Robotics	Total Quality Management	Green & Sustainable Manufacturing	Operation Research Techniques	Industrial Robotics
						Industrial Safety & Environment	Introduction to Renewable Energy resources

Note : Open electives are strictly applicable for other branches students only.

RTM Nagpur University
Syllabus (Theory)

Semester	Course Title (Subject) <i>code: BSE1-5T</i>	Hours / Week			Credits	Maximum Marks			Exam Durati on (Hrs.)
		L	T	P		Continu al Assessm ent	Univers ity Examin ation	Total	
B.E. I Sem	Engineering Graphics	1			1	15	35	50	03

Sr. No.	Course Objective The objective of this course is—
1	To acquire basic knowledge about engineering drawing language, line types, dimension methods, and simple geometrical construction. To draw conic sections by various methods, involutes, cycloid and spiral.
2	To acquire basic knowledge about physical realization of engineering objects and shall be able to draw its different views. To imagine visualization of lateral development of solids.
3	To visualize three dimensional engineering objects and shall be able to draw their isometric views
Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	The learner will able to understand the basic knowledge of engineering graphics such as instruments, lines, dimensioning techniques, scales, sheet layout. Construct the various engineering curves using the drawing instruments and basic of orthographic projection through drawing the projection of point and line.
CO2	The learner will able to understand projections of different types planes (2D) and solids (3D) and will be able to draw different views of plane and solids.
CO3	The learner will able to understand concept of sectioning and development of lateral surfaces of solid and will able to represent it.
CO4	Apply the visualization skill to draw a simple isometric projection/view from given orthographic views precisely using drawing equipment

SYLLABUS	
Contents	No of hours
Unit I: Introduction to Engineering Graphics: Introduction to Engineering Graphics, Use of various drawing instruments, Sizes of drawing sheets, different types of lines used in drawing practice. Dimensioning linear, angular, aligned system, unidirectional system, Introduction to scales & scale factor (RF). Basics of Orthographic Projections: Basic principles of orthographic projection, reference planes, concepts of four quadrants, methods of orthographic projections. First angle projections,	3

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(Anand)

Dr. Sajid Anwar
(Dr. Sajid Anwar)

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References:**Text Books Recommended:**

Bhatt, N. D. and Panchal, V. M., (2016), "Engineering Drawing", Charotar Publication, Anand, India

Dhawan, R. K., (2000), "A Textbook Of Engineering Drawing", S. Chand, New Delhi

Reference Books Recommended:

Jolhe, D. A., (2015), "Engineering Drawing ", Tata McGraw Hill, New Delhi

Shah P J, (2012) 'Basics of Engineering Graphics' S. Chand, New Delhi

P.S. Gill , (2015) "Engineering Drawing", S.K.Kataria and sons,

RTM Nagpur University
Proposed Syllabus (Practical)

Semester	Course Title (Subject) <i>Code: BSE1-5P</i>	Hours / Week			Credits	Maximum Marks			Exam Duration (Hrs.)
		L	T	P		Continual Assessment	University Examination	Total	
B.E. I Sem	Engineering Graphics lab	-	-	4	2	25	25	50	

Sr. No.	Course Objective The objective of this course is-
1	To acquire basic knowledge about engineering drawing , line types, dimension methods, and simple geometrical construction. To draw conic sections by various methods, involutes, cycloid and spiral.
2	To acquire basic knowledge about physical realization of engineering objects and shall be able to draw its different views. To imagine visualization of lateral development of solids.
3	To visualize three dimensional engineering objects and shall be able to draw their isometric views
Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	Draw the fundamental engineering objects using basic rules and able to construct the lines, simple geometries. Construct the various engineering curves using the drawing instruments.
CO2	Draw two dimensional and three dimensional objects, precisely using drawing equipment.
CO3	Draw the development of lateral surfaces for cut section of geometrical solids precisely using drawing equipment.
CO4	Draw a simple isometric projection from given orthographic views precisely using drawing equipment.

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Sr. No.	List of practical	No of hours	No of sheet
01	Projection of Straight lines – Simple positions, Minimum 4 problems on Projection of Straight lines: Inclined to both the planes.	2	1
02	Two problems each of Construction of conic section by using various methods. Ellipse, Parabola and Hyperbola, One problem each of Cycloid, Involute, Archimedean Spiral.	2	1
03	Minimum 4 problems on Projection of planes – Perpendicular and oblique planes	2	1
04	Minimum 4 problems on Projection on auxiliary planes(Excluding True shape)	4	1
05	Minimum 4 problems on Projection of Solids : Simple positions, Axis inclined to one plane & parallel to other	4	1
06	Minimum 4 problems on Section of Solids(only one stage) – Prism & Pyramids, Cylinder & Cones, Development of Lateral Surfaces – Prism, Pyramid, Cylinder & Cones	4	1
07	Minimum 4 problems on Isometric View and Minimum 4 problems Projection, Prism, Pyramid Cylinder and Cone, General Object	6	2
	Total	24	08
References: Text Books Recommended: Bhatt, N. D. and Panchal, V. M., (2016), "Engineering Drawing", Charotar Publication, Anand, India Dhawan, R. K., (2000), "A Textbook Of Engineering Drawing", S. Chand, New Delhi Reference Books Recommended: Jolhe, D. A., (2015), "Engineering Drawing ", Tata McGraw Hill, New Delhi Shah P J, (2012) 'Basics of Engineering Graphics' S. Chand, New Delhi P.S. Gill , (2015) "Engineering Drawing", S.K.Kataria and sons,			

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RTM Nagpur University
Syllabus (Practical)

Semester	Course Title(Subject)	Hours / Week			Credits	Maximum Marks		
		L	T	P		Continual Assessment	University Examination	Total
Semester II First Year	Workshop Practices code: BSE2-5P	-	-	4	2	50	50	100

Course Outcomes

After successful completion of this course the student will be able to:

CO1	Read and interpret job drawing and plan operations
CO2	Identify and select proper material, tools, equipments, machines and proper operational parameters.
CO3	Set tools, work piece, and machines for desired operations.
CO4	Complete job of Carpentry, Fitting, Welding and Smithy as per job drawing in allotted time.
CO5	Use safety equipment and follow safety procedures during operations.
CO6	Inspect the job for confirming desired dimensions and shape.

List of Practical's

Sr. No.	List of Practical's
01	CARPENTRY SHOP - Demonstration of different wood working tools and machines. - Demonstration of different wood working processes, like planing, marking, chiseling, grooving, turning of wood etc. One simple job involving any one joint like mortise and tenon, dovetail, bridle, half lap etc.(4 Hours of actual working)
02	FITTING SHOP: - Demonstration of different fitting tools and drilling machines and power tools. - Demonstration of different operations like chipping, filing, drilling, tapping, cutting etc. One simple fitting job involving practice of chipping, filing, drilling, tapping, cutting etc.
03	WELDING SHOP : Demonstration of different welding tools / machines. Demonstration on Arc Welding, Gas Welding, gas cutting. One simple job involving butt and lap joint. For each students.
04	SMITHY SHOP - Demonstration of different forging tools and Power Hammer. - Demonstration of different forging processes, likes shaping, caulking fullering, setting down operations etc. - One job like hook peg, flat chisel or any hardware item.

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05

Suggested References:

- S.K. HajaraChaudhary- Workshop Technology-Media Promotors and Publishers, New Delhi
- B.S. Raghuwanshi- Workshop Technology- DhanpatRai and sons, New Delhi
- H.S.Bawa- Workshop Technology- Tata McGraw Hill Publishers, New Delhi
- Kent's Mechanical Engineering Hand book- John Wiley and Sons, New York
- Electronics Trade & technology Development Corporation.(A Govt. of India undertaking) Akbar Hotel Annex, Chanakyapuri, New Delhi- 110 021
- Learning Materials Transparencies and CDs, CBT Packages developed by N.I.T.T.E.R. and other organizations.

Notes:

A journal shall consist of one job assignment each on the topics 1 to 4 mentioned above.

Each assignment shall consist of –

- Procedural steps in completing a given job
- Description and drawings of different tools used
- List of safety equipments used and safety rules observed during working

Notes: 1] The subject teacher should provide necessary theory inputs to students of all shops before their actual practical.

2] The instructor shall give demonstration to the students by preparing a specimen job as per the job drawing.

3] The workshop diary shall be maintained by each student duly signed by instructor of respective shop

4] Workshop Tool Manual at institute level shall be provided to the students

5] Distribution of Continuous Assessment marks is as follows:

20 marks for jobs completed (05 marks for each job)+ 05 marks for Practical journal= Total 25 marks

6] University Examination – Performance of any one job as mentioned in list of practical and oral.

Girya
Dr. M. N. Girya

Abhishek
(Anandh)

Abhishek

BR
(B.R. Chidre)