



Sanmarg Shikshan Sanstha's
SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING
AN AUTONOMOUS INSTITUTE
NAAC ACCREDITED

Recognized by Government of Maharashtra & AICTE New Delhi
Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
Near Dighori Naka, Umrer Road, Nagpur - 440 034
Mob. : 9881014701, 9823464644, 8983550843
Email : admin@srpce.ac.in • website : www.srpce.ac.in

Department of Mechanical Engineering

Aim:-

To make a mechanical engineer familiar with theoretical and practical aspects of various fields of mechanical engineering.

Vision:-

The Mechanical Engineering department believes in bringing an attitudinal change in the students to their learning & developing qualities and skills of the discipline which would facilitate them to face challenges of emerging trends of industry & society with confidence and perfection.

Mission:-

- M1:-** To provide academic and cultural foundation to every students of Mechanical engineering.
- M2:-** To enhance the overall academic performance of the students gradually thereby increasing their placement potential.
- M3:-** To realise his/her greatest potentials emphasizing social emotional, physical and spritual development.
- M4:-** To develop the positive attitude and great confidence in the graduates of Mechanical engineering to face the current challenges of industry & society.
- M5:-** To motivate for creative thinking thereby enhansing the teaching-learning experience and developing the research activity.



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PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- PEO1:** To prepare the students for successful careers in industry that meet the needs of Indian and multinational companies.
- PEO2:** To develop the ability among students to synthesize data and technical concepts for application to product design.
- PEO3:** To provide opportunity for students to work as part of teams on multi disciplinary projects.
- PEO4:** To develop various soft skills among students in order to prepare them for pursuing diverse careers in industry.
- PEO5:** To provide students with a sound foundation in mathematical, scientific and engineering fundamentals necessary to formulate, solve and analyze engineering problems and to prepare them for graduate studies.
- PEO6:** To develop Techno-commercial skills like, Research Aptitude, Entrepreneurship and Creative efforts in Mechanical Engineering and aligned areas of Science and Technology.
- PEO7:** To make student aware of Rapid changing technology and groom them to keep pace with global trends with multidisciplinary engineering knowledge.
- PEO8:** Mechanical Engineering department is dedicated to graduating engineer who
- Will apply fundamentals of engineering science to find workable and economical solution to new problem arising in different field of Mechanical Engineering.
 - Will practice mechanical engineering in responsible, professional and ethical manner for the benefits of Industry and Society.



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PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **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.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.



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- 10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- PSO1:** An ability to identify, formulate and solve engineering problems in three core streams of Mechanical Engineering, i.e. design engineering, thermal and fluids engineering and manufacturing engineering.
- PSO2:** An ability to design, develop and test an energy efficient system for required engineering applications.
- PSO3:** An ability to use CAD/CAM/CAE/Computational tools to solve engineering problems.
- PSO4:** An ability to represent and read an engineering idea physically by means of 2D / 3D drawing.
- PSO5:** An ability to prepare and execute the plan to manufacture components / assembly.



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SRPCE/Dean Academics/2026-27/

Date: - 15/06/2026

All BOS Chairmans of various department are advised to maintain the credit structure of different semesters are as give below.

Semester	Tot. credits	CREDITS															
		BSC	ESC	PCC	PEC	MDM	OE	VSEC	AEC	Entr/Eco co/Management	IKS	VEC	RM	CEP/FP	Project	Inter/OJT	CC
B.Tech- I Sem	22	7	9	-	-	-	-	2	2	-	-	-	-	-	-	-	2
B.Tech- II Sem	22	8	6	2	-	-	-	2	-	-	2	-	-	-	-	-	2
B.Tech- III Sem	21	-	-	10	-	2	3	-	-	2	-	2	-	2	-	-	-
B.Tech- IV Sem	23	-	-	10	-	2	3	2	2	2	-	2	-	-	-	-	-
B.Tech- V Sem	19	-	-	10	4	3	2	-	-	-	-	-	-	-	-	-	-
B.Tech- VI Sem	21	-	-	08	8	3	-	2	-	-	-	-	-	-	-	-	-
B.Tech- VII Sem	20	-	-	04	8	-	-	-	-	-	-	-	4	-	4	-	-
B.Tech- VIII Sem	16	-	-	-	-	4	-	-	-	-	-	-	-	-	-	12	-
TOTAL CREDITS = 164		15	15	44	20	14	8	8	4	4	2	4	4	2	4	12	4

P. Pawar
24/7/26
Dr. P. D. Sawarkar
VNIT NGP

30
64
24/7/26
Dr. Y. M. Sonkhaskar
RKNC NGP

24/7/26
Dr. S. V. Borkar

24/07/2026
R. Takhalate
24/7/26
(Rohit Takhalate)

24/7/26
Atul. Tete

24/7/26
Chairman
Dr. A. H. Singh

SRPCE-MECHANICAL ENGG.

VERSION: 1.0

Effective from session 2026-27
SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING
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SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR - 440034

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CREDIT FRAMEWORK STRUCTURE as per NEP & UGC Regulations(W.e.f.2026-27)

CREDIT FRAMEWORK STRUCTURE as per NEP & UGC Regulations [W.E.1.2020-27]													
Credits as per Govt.	SEMESTER		I	II	III	IV	V	VI	VII	VIII	Total Credits	Condition in which semester is to be used.	
	COURSE CATEGORY												
14---18	Basic Science Course	[30] BSC/ESC	7	8							15	B.Tech- I & II Sem ONLY	
			6---8	8---10							14---18		
16---12	Engineering Science Course		9	6							15	B.Tech- I & II Sem ONLY	
			10---8	6---4							16---12		
44---56	Program Core Course (PCC)	[64---76] PCC	2	10	10	10	8	4			44	B.Tech-III, IV,V,VI,VII & VIII Sem.	
			2	8---10	8---10	10---12	8---10	4---6	4---6		44---56		
20	Program Elective Course (PEC)	{Professional Core Courses}				4	8	8			20	B.Tech-V,VI,VII & VIII Sem.	
							4	8	2	6	20		
14	Multidisciplinary Minor (MDM)	[22] MDM		2	2	3	3		4		14	B.Tech-III, IV,V,VI,VII & VIII Sem.	
	Multidisciplinary Open Elective (OE) Other than a particular program			2	2	4	2	2	2		14		
8				3	3	2					8	B.Tech-III, IV & V Sem.	
				4	2	2					8		
4+4=8	Vocational and Skill Enhancement Course (VSEC)	VSEC(Skill Courses [4+4=08])	VSEC-I=2	VSEC-II=2	VSEC-III=2		VSEC-IV=2				8	B.Tech-I, II Sem & III, IV Sem & V,VI Sem.	
			VSC-I=2	SEC-I=2	VSC-II=2		SEC-II=2				8		
4	Ability Enhancement Course (AEC-01,AEC-02)	Humanities Social Science and Management (HSSM) [14]	2		2						4	B.Tech-I, II Sem & III, IV Sem	
			AEC-I=2		AEC-II=1						4		
4	Enterprenurship/Economic /Management Courses				2	2						4	B.Tech- III & IV Sem ONLY.
					2	2						4	
2	Indian Knowledge System (IKS)	[14]		2							2	B.Tech- I Or II Sem ONLY	
				2							2		
4	Value Education Course (VEC)			2	2						4	B.Tech- III & IV Sem ONLY.	
				2	2						4		
4	Reserch Methodology	Experiential Learning Courses [22]						4			4	B.Tech- VIII Sem. ONLY.	
										4		4	
2	Comm.Engg.Project (CEP)/Field Project (FP)				2							2	B.Tech- III Or IV Sem ONLY.
					2							2	
4	Project							4			4	B.Tech-VII & VIII Sem.	
									2	2		4	
12	Intership/OJT								12		12	B.Tech-VII Or VIII Sem.	
									12			12	
4	Co-curricular Courses (CC)	Liberal Learning Courses	2	2							4	B.Tech- I & II Sem ONLY	
			2	2							4		
Total Credits allotted in S.R.P.C.E.Nagpur											164		
164---176	Total Credits as per NEP/UGC		Total Credits as per NEP/UGC								164-176		

NOTE:- In Colour row credits indicates as per NEP/UGC Circular, Whereas in white row credits are allotted

Dr. S.V. Raut 24/07/2026 VERSION:-1.0

Radhakalate 24/7/26 (Rohit T) Effective from session 2026-27

Radhakalate 24/7/26 (Rohit T) Effective from session 2026-27



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SRPCE/Dean Academics/2026-27/

Date: - 12/07/2026 (Revised)

All BOS Chairmans of various department are advised to maintain the credit structure of different semesters are as give below.

Semester	Tot. credits	CREDITS															
		BSC	ESC	PCC	PEC	MDM	OE	VSEC	AEC	Entr/Eco/Ma nag.	JKS	VEC	RM	CEP /FP	Project	Inter /OJT	CC
B.Tech- I Sem	22	07	09	-	-	-	-	VSEC-I 02	AEC-I 02	-	-	-	-	-	-	-	02
B.Tech- II Sem	22	08	06	02	-	-	-	VSEC-II 02	-	-	02	-	-	-	-	-	02
B.Tech- III Sem	21	-	-	10	-	MDM-I 02	OE-I 03	-	-	02	-	02	-	02	-	-	-
B.Tech- IV Sem	23	-	-	10	-	MDM-II 02	OE-II 03	VSEC-III 02	AEC-II & AEC-III 02	02	-	02	-	-	-	-	-
B.Tech- V Sem	19	-	-	10	04	MDM-III 03	OE-III 02	-	-	-	-	-	-	-	-	-	-
B.Tech- VI Sem	21	-	-	08	08	MDM-IV 03	-	VSEC-IV 02	-	-	-	-	-	-	-	-	-
B.Tech-VII Sem	20	-	-	04	08	-	-	-	-	-	-	-	04	-	02+02	-	-
B.Tech- VIII Sem	16	-	-	-	-	MDM-V & MDM- VI 02+02	-	-	-	-	-	-	-	-	-	12	-
TOTAL CREDITS = 164		15	15	44	20	14	08	08	04	04	02	04	04	02	04	12	04

P. Sawale
24/7/26
Dr. P. D. Sawarkar
UNIT NGP
SRPCE-MECHANICAL ENG

Dr. Y. M. Sonkhaskar
24/7/26
RINCE
NGP

Dr. S. R. Jha
24/7/26

R. Takhalake
24/7/26
(Rohit Takhalake)
VERSION: 1.0

HSSM= 14

Dr. Banglone
24/07/2026

Dr. A. H. Jale
24/7/26
Atul. Tek

Effective from 2026-27
Chairman

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SMT. RADHIKATAI PANDAV COLLEGE
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BAHADURA, NAGPUR
24/7/26

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR
An Autonomous Institute

MULTIPLE ENTRY & MULTIPLE EXIT CREDIT FRAMEWORK

B.Tech.- Mechanical Engineering-NEP (Choice Based Credit System) Major with Minor in Multidisciplinary

Levels	Qualification Title	Credit Requirements as per NCf/UGC		SRPCE CREDITS (Major)	Semester	Year	EXIT OPTION:-
		Mini.	Maxi.				
4.5	One Year UG Certificate in Engg./Tech.	40	44	44	2	1	<u>Exit option :</u> Award of UG Certificate in Major with 44 credits and an additional 8 credits in skill based courses (Online), internship , mini project etc
5	Two Years UG Diploma in Engg./Tech.)	80	88	88	4	2	<u>Exit option :</u> Award of UG Diploma in Major with 88 credits and an additional 8 credits in skill based courses (Online), internship , mini project etc
5.5	Three Years Bachelor's Degree in Vocation (B.Voc.) or B.Sc (Engg./Tech.)	120	132	128	6	3	<u>Exit option :</u> Award of UG Degree B.Voc/B.Sc. in Major with 128 credits and an additional 8 credits in skill based courses (Online), internship ,mini project etc
6.0	4 years Bachelor's degree (B.E./B.Tech. or Equivalent) in Engg./Tech. with Multidisciplinary Minor	160	176	164	8	4	<u>Exit option :</u> Award of UG Degree B.E./B.Tech. in Major with Multidisciplinary Minor with 164 credits .
6.0	4-years Bachelor's degree (B.E./B.Tech. or Equivalent) in Engg./Tech.-Honors and Multidisciplinary Minor	180	194	164	8	4	The students would take up five-six additional courses of 18 to 20 credits in Same Discipline (Major Program) distributed over semester III TO VIII. These (18-20) credits will be over and above 164 credits offered by specified program.
6.0	4-years Bachelor's degree B.E./B.Tech. or Equivalent) in Engg./Tech.-Honors with Research and Multidisciplinary Minor.	180	194	164	8	4	The students would work on Research Project/dissertation for (18-20) credits in the Fourth Year (VII & VIII Sem) in the respective Major Engg./Tech Discipline. These (18-20) credits will be over and above the 164 credits prescribed for Four Year Multidisciplinary Bachelor's Degree in Engg./Tech. Program.
6.0	4-years Bachelor's degree (B.E./B.Tech. or Equivalent) in Engg./Tech.-Major Engg. Discipline with Double Minors (Multidisciplinary and Specialization Minors)	180	194	164	8	4	The students would take up five-six additional courses of 18 to 20 credits in another Engg./Tech. Discipline/Emerging Areas Specialization distributed over semester III TO VIII. These (18-20) credits will be over and above the 164 credits prescribed for Four Year Multidisciplinary Bachelor's Degree in Engg./Tech. Program.

P. Sawarkar 24/7/26
 Dr. P. D. Sawarkar
 VNIT Nagpur
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24/7/26
 Dr. Y. M. Sonkhalkar
 RKNCE NGP

24/7/26
 Dr. S. V. Borkar

24/07/2026
 ReTakhalate
 24/7/26
 (Rohit Takhalate)

24/7/26
 Dr. A. H. Jangle
 Chairman
 -PRINCIPAL
 SMT. RADHIKATAI PANDAV COLLEGE
 OF ENGINEERING
 EFFECTIVE FROM 2026-27

24/7/26
 Atul. Tete



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Department of Mechanical Engineering

Course Category Wise Credit Distribution For Four Year Under Graduate Programme

B.Tech as per NCrF & NEP-2020

Sr.No.	Course Category	As Per NEP GR	SRPCE Credits	CC (Course Category)	As Per NEP GR	SRPCE Credits
1	Basic Science Course (BSC) & Engg Science Course (ESC)	30	30	BSC	14-18	15
				ESC	16-12	15
2	Programme Course	64-76	64	PCC(Programme Core Courses)	44-56	44
				PEC(Programme Elective Course)	20	20
3	Multidisciplinary Courses	22	22	MDM (Multi disciplinary Minor)	14	14
				OE(Open Elective)	08	08
4	Skill Courses VSEC :- 1)VSC 2) SEC	08	08	VSC	04	02+02
				SEC Basket	04	02+02
5	Humanities Social Science & Management (HSSM)	14	14	AEC	04	02+02
				EEM	04	04
				IKS	02	02
				VEC	04	04
6	Experimental Learning Courses	22	22	RM	04	04
				CEP/FP	02	02
				PR	04	04
				IN/OGT	12	12
7	Liberal Learning Courses	04	04	CC(Co-Curricular courses)	04	04
Total Credits		164-176	164		164---176	164

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24/7/26
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VNIT Nagpur

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24/7/26
Dr. Y. M. Sonkhaskar
RKNCE NGP

Dr. S. V. Borkar
24/7/26
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Dr. S. V. Borkar

Dr. S. V. Borkar
24/7/26
Dr. S. V. Borkar

SRPCE MECHANICAL ENGG.

VERSION:-1.0

Effective from session:-2026-27

Dr. A. H. Jangle
24/7/26
Dr. A. H. Jangle
Chairman

Atul. Tete
24/7/26
Atul. Tete

Dr. S. V. Borkar
24/7/26
Dr. S. V. Borkar (Rahul Takhalate)

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Semester wise Credit Distribution Structure for Four Year UG Mechanical
Engineering (Major) and Minor in Multidisciplinary

Category	Semester	I	II	III	IV	V	VI	VII	VIII	Total Credits
Basic Science Course	BSC	7	8	--	--	--	--	--	--	15
Engineering Science Course	ESC	9	6	--	--	--	--	--	--	15
Programme Core Course (PCC)	Program Courses	--	2	10	10	10	8	4	--	44
Programme Elective Course (PEC)	Program Courses	--	--	--	--	4	8	8	--	20
Multidisciplinary Minor (MDM)	Multidisciplinary Courses	--	--	2	2	3	3	--	4	14
Open Elective (OE) Other than a particular program	OE	--	--	3	3	2	--	--	--	8
Vocational and Skill Enhancement Course(VSEC)	Skill Courses	2	2	--	2	--	2	--	--	8
Ability Enhancement Course (AEC-01,AEC-02)	Humanities Social Science and Management(HSSM)	2	--	--	2	--	--	--	--	4
Entrepreneurship/Economics/Management Courses	(HSSM)	--	--	2	2	--	--	--	--	4
Indian Knowledge System (IKS)	(HSSM)	--	2	--	--	--	--	--	--	2
Value Education Course(VEC)	(HSSM)	--	--	2	2	--	--	--	--	4
Research Methodology	Experiential Learning Courses	--	--	--	--	--	--	4	--	4
Comm. Engg. Project(CEP)/Field Project(FP)	CEP	--	--	2	--	--	--	--	--	2
Project	Project	--	--	--	--	--	--	4	--	4
Internship/OJT	OJT	--	--	--	--	--	--	--	12	12
Co-curricular Courses(CC)	Liberal Learning Courses	2	2	--	--	--	--	--	--	4
Total Credits(Major)		22	22	21	23	19	21	20	16	164

P. Sawant
24/7/26
Dr. P. D. Salunkar
VNIT Nagpur

Dr. Y. M. Sonkhaskar
24/7/26
RKNCE NGP

Dr. S. R. Tule
24/7/26

Dr. S. V. Borikar
24/7/26
B. Chaudhane
24/07/2026

SRPCE MECHANICAL ENGG.

VERSION:1.0

EFFECTIVE FROM 2026-27

Dr. A. H. Ingole
24/7/26
Chairman

R. Takhalade
24/7/26
(Rahul Takhalade)

S. S. Pawar
24/7/26

Atul Tete
24/7/26

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OF ENGINEERING



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B.Tech. Semester-I Mechanical Engineering-NEP (Choise Based Credit System) Major with Minor in Multidisciplinary

Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs./ Week)			Total Hrs per Week	Total Credits	Examination Scheme						
					L	T	P			Theory			Practical		Min. Pass Marks	Total Marks
										Exam.Hrs.	CIE	ESE	CIE	ESE		
1	BSC-I	BT1ME01T	Applied Mathematics-I	ASH	3	—	—	3	3	3	40	60	—	—	50	100
2	BSC-II	BT1ME02T	Applied Physics	ASH	3	—	—	3	3	3	40	60	—	—	50	100
3	BSC-II	BT1ME02P	Applied Physics lab	ASH	—	—	2	2	1	—	—	—	25	25	25	50
4	ESC-I	BT1ME03T	Engineering Graphics	Mech	3	—	—	3	3	3	40	60	—	—	50	100
5	ESC-I	BT1ME03P	Engineering Graphics Lab	Mech	—	—	2	2	1	—	—	—	25	25	25	50
6	ESC-II	BT1ME04P	Basic of computer C Programming Lab	CE	—	—	2	2	1	—	—	—	25	25	25	50
7	ESC-III	BT1ME05T	Basics of Electrical & Electronics Engineering.	ETC	3	—	—	3	3	3	40	60	—	—	50	100
8	ESC-III	BT1ME05P	Basics of Electrical & Electronics Engineering Lab	ETC	—	—	2	2	1	—	—	—	25	25	25	50
9	AEC-I	BT1ME06T	Communication Skill	ASH	2	—	—	2	2	2	20	30	—	—	25	50
10	VSEC-I	BT1ME07P	VSC-I:- Technical Skill Development-I Workshop Practice	Mech	—	—	4	4	2	—	—	—	50	50	50	100
11	CC-I	BT1ME08P	Refer CC-I Basket	ASH	—	—	4	4	2	—	—	—	100	—	50	100
			Total		14	—	16	30	22	—	180	270	250	150	—	850

Total Credits till B.Tech-I Sem = 22

Theory 5 & Practical 6

P. D. Sawarkar
24/7/26

Dr. P.D. Sawarkar
VNIT Nagpur

Y.M. Sonkhaskar
24/7/26

Dr. Y.M. Sonkhaskar
RKNCE Nagpur

S.V. Borkar
24/7/26

Dr. S.V. Borkar
P.B.C.O.E. NGP.

N.B. Ghanghane
24/07/2026

(Nilesh B. Ghanghane)

S.R. Iyer
24/7/26

Dr. S.R. Iyer

Atul. Tete
24/7/26

Atul. Tete

R. Takhalate
24/7/26

(Rahul Takhalate)

Dr. A.H. Ingle
24/7/26

(Dr. A.H. Ingle)
Chairman

P.S. J. Pawar
24/7/26

SRPCE-MECHANICAL ENGG.

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Sanmarg Shikshan Sanstha's
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CIE:- Contineous Internal Evaluation. CIE=40 Marks are distributed MSE=20 Marks, Attendance=10 Marks, Assignments=10 Marks

ESE:- End Semester Examination.
05 Marks, Assignments=05 Marks

CIE=20 Marks are distributed MSE=10 Marks, Attendance=

BSC:- Basic Science Course

MSE:- Mid Semester Examination

ESC:- Engineering Science Course

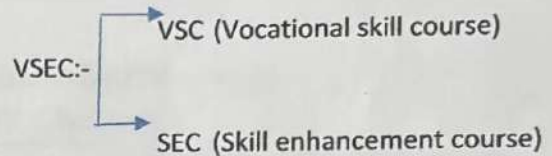
AEC:- Ability Enhancement Course

VSEC:- Vocational & Skill Enhancement Cc

CC:- Co-Curricular Course

VSC:- (Vocational skill course

SEC:- Skill enhancement course



P. Sawarkar
Dr. P. D. Sawarkar
24/7/26
VNIT Nagpur

Y. M. Sonkhaskar
24/7/26
Dr. Y. M. Sonkhaskar
RKNCE NGP

A. Tete
24/7/26
Atul. Tete

S. V. Borkar
24/7/26
Dr. S. V. Borkar

B. Ghaghare
24/07/2026
(Nilesh. B. Ghaghare)

R. Takholale
24/7/26
(Rohul Takholale)

S. R. Ingle
24/07/26
Dr. S. R. Ingle

A. H. Ingle
24/7/26
(Dr. A. H. Ingle)
Chairman

S. S. Pawar
24/7/26
Dr. S. S. Pawar

[Signature]

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B.Tech. Semester-I Mechanical Engineering NEP (Choise Based Credit System)Major with Minor in Multidisciplinary

List of Ability Enhancement Course:- AEC-I

Course Category	Course Code	Name of Course	Total Credits	Semester
Ability Enhancement Course (AEC-I)	BT1ME06T	Communication Skill	2	I

List of VSEC-I Course (Vocational and Skill Enhancement Course):- VSC-I (Vocational Skill Course).

Course Category	Course Code	Name of Course	Total Credits	Semester
Vocational Skill Enhancement Course (VSEC-I)	BT1ME07P	Technical Skill DevelopmentI(Workshop	2	I

List of CC-I Basket(Liberal Learning Courses).

Course Category	Course Code	Name of Course	Total Credits	Semester
Liberal Learning Courses(CC-I)	BT1ME08P	National Social Services(NSS)	2	I
	BT1ME08P	Games & Sports	2	
	BT1ME08P	Cultural Activities	2	
	BT1ME08P	Yoga	2	
	BT1ME08P	Elements of Japanese	2	
	BT1ME08P	Elements of German	2	
	BT1ME08P	Elements of French	2	
	BT1ME08P	Elements of Spanish	2	

CC:- Co-curricular Course, AEC:- Ability Enhancement Course, VSEC:- Vocational Skill Enhancement Course.

P. Sawarkar
 Dr. P. D. Sawarkar
 24/7/26
 YNIT NGP

Dr. Y. M. Sonkhaskar
 Dr. Y. M. Sonkhaskar
 24/7/26
 R. K. N. C. E. NGP

S. R. D. D. D.
 24/07/26
 Dr. S. R. D. D.

Dr. S. V. Borkar
 Dr. S. V. Borkar
 24/7/26

B. D. D. D.
 Dr. B. D. D. D.
 24/07/2026

Atul Tete
 Atul Tete
 24/7/26
 SRPCE-MECHANICAL ENGG.

R. S. P. P.
 R. S. P. P.
 24/7/26
 (Rohit Takhalale)

P. S. P. P.
 P. S. P. P.
 24/7/26

Chairman
 Chairman
 24/7/26
 Dr. A. H. Ingle

Principal
 Principal
 24/7/26

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B.Tech. Semester-II Mechanical Engineering NEP (Choice Based Credit System) Major with Minor in Multidisciplinary

List of Indian Knowledge System Courses (IKS)

Course Category	Course Code	Name of Course	Credits	Semester
Indian Knowledge System (IKS)	BT2ME06T	Consciousness Studies	2	II SEM
	BT2ME06T	Preserving Art, Cultural & Traditional	2	
	BT2ME06T	Wellness , Tradition Medicines & Yoga	2	
	BT2ME06T	Glimses of Ancient Science & Technology	2	

List of VSEC-II (Vocational Skill Enhancement Courses)

Course Category	Course Code	Name of Course	Credits	Semester
Vocational Skill Enhancement Courses VSEC-II	BT2ME07P	Engineering Metallurgy	2	II SEM
	BT2ME07P	Digital Marketing	2	
	BT2ME07P	Advance Excel	2	
	BT2ME07P	Personality Development & Communication	2	

List of CC-II Basket(Liberal Learning Courses).

Course Category	Course Code	Name of Course	Credits	Semester
Liberal Learning Courses(CC-II)	BT2ME08P	National Social Services(NSS)	2	II SEM
	BT2ME08P	Games & Sports	2	
	BT2ME08P	Cultural Activities	2	
	BT2ME08P	Yoga	2	
	BT2ME08P	Elements of Japanese Language(NPTEL Online)	2	
	BT2ME08P	Elements of German Language(NPTEL Online)	2	
	BT2ME08P	Elements of French Language(NPTEL Online)	2	
	BT2ME08P	Elements of Spanish Language(NPTEL Online)	2	

CC:- Co-curricular Course, VSEC:- Vocational Skill Enhancement Course, IKS:-Indian Knowledge System

P. D. Sawarkar
 24/7/26
 Dr. P. D. Sawarkar
 VNITWGP

R. K. N. C. E.
 24/7/26
 R. K. N. C. E.
 NGP

S. S. Pawar
 24/7/26
 S. S. Pawar
 22.5.2.2026

R. Takhalate
 24/7/26
 R. Takhalate
 24/7/26

B. Chougane
 24/7/2026
 B. Chougane

Dr. A. H. Jais
 24/7/26
 SRPCE MECHANICAL ENGG.
 Chairman

Atul. Tete
 24/7/26
 Atul. Tete

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B.Tech. Semester-III Mechanical Engineering-NEP (Choise Based Credit System)
Major with Minor in Multidisciplinary

Sr. No	Course Category	Course Code	Name of Course	BoS	Teaching Scheme (hrs./Week)			Total Hrs per Week	Total Credits	Examination Scheme						
					L	T	P			Ex a m.	Theory		Practical		Min. Pass. Marks	Total Marks
											CIE	ESE	CIE	ESE		
1	PCC-II	BT3ME01T	Manufacturing Processes	MECH	2	—	—	2	2	2	20	30	—	—	25	50
2	PCC-II	BT3ME01P	Manufacturing Processes Lab	MECH	—	—	2	2	1	—	—	—	25	25	25	50
3	PCC-III	BT3ME02T	Fluid mechanics & Hyadruatic Machines	MECH	3	—	—	3	3	3	40	60	—	—	50	100
4	PCC-III	BT3ME02P	Fluid mechanics & Hyadruatic Machines Lab	MECH	—	—	2	2	1	—	—	—	25	25	25	50
5	PCC-IV	BT3ME03T	Engineering Thermodyamics	MECH	2	—	—	2	2	2	20	30	—	—	25	50
6	PCC-V	BT3ME04P	Machine Drawing Lab	MECH	—	—	2	2	1	—	—	—	25	25	25	50
7	MDM-I	BT3ME05T	Refer MDM-I Basket	MECH	2	—	—	2	2	2	20	30	—	—	25	50
8	OE-I	BT3ME06T	Refer OE Basket	MGT	3	—	—	3	3	3	40	60	—	—	50	100
9	HSSM-III	BT3ME07T	Introduction to Innovation & Enterprenureship	MGT	2	—	—	2	2	2	20	30	—	—	25	50
10	HSSM-IV VEC-I	BT3ME08T	Constitution of India	ASH	2	—	—	2	2	2	20	30	—	—	25	50
11	CEP/FP	BT3ME09P	Community Engagement Project/Field Project	MECH	—	—	4	4	2	—	—	—	50	50	50	100
			Total		16		10	26	21		180	270	125	125		700

Cummulative Total Credits till B.Tech. III Semester=65

Theory 7 & Practical 4

P. Sawarkar
24/7/26
Dr. P. D. Sawarkar
VNIT NGP

Dr. Y. M. Sonkhaskar
24/7/26
Dr. Y. M. Sonkhaskar
RIKNCENGP

Dr. J. K. Fule
24/07/26
Dr. J. K. Fule

Dr. S. V. Borkar
Dr. S. V. Borkar

Atul. Tele
24/7/26
SRPCE-MECHANICAL ENGG.

Dr. S. J. Pawar
24/7/26

Dr. A. H. Ingle
24/7/26
Dr. A. H. Ingle
Chairman

R. Takhalate
24/7/26
(Rahul Takhalate)

Dr. S. V. Borkar
24/07/2028

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B.Tech. Semester-III Mechanical Engineering NEP (Choise Based CreditSystem)Major with Minor in Multidisciplinary

List of Open Electives (OE) offered by Management BOS
Open Elective Basket

For the Students of **Mechanical Engineering**, Electrical Engineering, Civil Engineering and Electronics & Telecommunication Engineering.

Course Category	Course Code	Name of Course	Credits	Semester
Open Elective -I (OE-I)	BT3ME06T	Stress Management	3	III Semester
Open Elective -II (OE-II)	BT4ME05T	Principles of Management	3	IV Semester
Open Elective -III (OE-III)	BT5ME06T	IPR Development & Training	2	V Semester

List of MDM-I Basket for Mechanical Engineering Students offered by other Department.

Multidisciplinary Minor offered by	Course Code	Name of Course	Credits	Semester
Minor in Electrical Engineering	BT3EE04T	Fundamentals of Electrical Engineering	2	III Semester.
Minor in Civil Engineering	BT3CV04T	Environmental Science	2	
Minor in Electronics & Telecommunication	BT3ET04T	Analog Electronics	2	
Minor in Computer Science & Engineering	BT3CS04T	Data Structure	2	
Minor in Computer Engineering	BT3CE04T	Data Structure	2	
Minor in Artificial Intelligence & Data Science.	BT3AD04T	Data Structure	2	

P. Bawale
24/7/26
Dr. P. D. Sawarkar
UNIT NGP

Dr. Y. M. Sonkhaskar
24/7/26

Dr. S. R. Jadhav
24/7/26

Dr. S. V. Berkar
24/7/26

Dr. H. H. H. H.
24/07/2028

Atul Tete
24/7/26
SRPCE-MECHANICAL Engg.

Rohit Takhalake
24/7/26

Dr. A. H. Ingle
24/7/26
chairman

Dr. S. S. Pawar
24/7/26

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B.Tech. Semester-IV Mechanical Engineering-NEP (Choise Based Credit System)
Major with Minor in Multidisciplinary

Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme (hrs./ Week)			Total Hrs per Week	Total Credits	Examination Scheme						
					L	T	P			Ex a m.	Theory		Practical		Min. Pass. Mark	Tot. Marks
											CIE	ESE	CIE	ESE		
1	PCC-VI	BT4ME01T	Machining Process	MECH	3	—	—	3	3	3	40	60	—	—	50	100
2	PCC-VI	BT4ME01P	Machining Process Lab	MECH	—	—	2	2	1	—	—	—	25	25	25	50
3	PCC-VII	BT4ME02T	Mechanics of Material	MECH	3	—	—	3	3	3	40	60	—	—	50	100
4	PCC-VII	BT4ME02P	Mechanics of Material Lab	MECH	—	—	2	2	1	—	—	—	25	25	25	50
5	PCC-VIII	BT4ME03P	Mechatronics Lab	MECH	—	—	2	2	2	—	—	—	50	50	50	100
6	MDM-II	BT4ME04T	Refer MDM-II Basket	MECH	2	—	—	2	2	2	20	30	—	—	25	50
7	OE-II	BT4ME05T	Refer OE Basket	MGT	3	—	—	3	3	3	40	60	—	—	50	100
8	VSEC-III	BT4ME06P	Refer VSEC-III Basket	MECH	—	—	4	4	2	—	—	—	50	50	50	100
9	AEC-II	BT4ME07P	TechnicalReport Writing	MECH	—	—	2	2	1	—	—	—	25	25	25	50
10	AEC-III	BT4ME08P	Communication Lab	ASH	—	—	2	2	1	—	—	—	25	25	25	50
11	HSSM-VI	BT4ME09T	Industrial Economics & Management	MGT	2	—	—	2	2	2	20	30	—	—	25	50
12	HSSM-VII (VEC-II)	BT4ME10T	Environmental Science	Civil	2	—	—	2	2	2	20	30	—	—	25	50
			Total		15		14	29	23		180	270	200	200		850

Cummulative Total Credits till B.Tech.-IV Semester=88

Theory 6 & Practical 6

P. D. Sawarkar
24/7/26

Dr. P. D. Sawarkar
VNIT NGP

Y. M. Sonkhaskar
24/7/26

Dr. Y. M. Sonkhaskar
RKNDU NGP

S. V. Borkar
24/7/26

Dr. S. V. Borkar
24/7/26

S. V. Borkar
24/7/26

Dr. S. V. Borkar
24/7/26

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Dr. A. H. Ingole
24/7/26
SRPCE-MECHANICAL ENGG.
Chairman
Dr. A. H. Ingole

Atul Tete
24/7/26
Atul Tete



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B.Tech. Semester-IV Mechanical Engineering-NEP (Choise Based Credit System) Major with Minor in Multidisciplinary

Vocational & skill Enhancement Courses Category:- VSEC-III Basket				
Course Category	Course Code	Name of Course	Credits	Semester
VSEC-III	BT4ME06P	Indian Standard and Reading of Engg. Drawing	2	IV SEM
	BT4ME06P	Mterology and Engg. Inspection	2	
	BT4ME06P	Automobile Mechanics	2	
	BT4ME06P	Machine Tool Maintenance	2	
	BT4ME06P	3-D Printing	2	

HSSM- Course (Humanities Social Science and Management):- AEC-II & AEC-III Course				
Course Category	Course Code	Name of Subject	Credits	Semester
AEC-II	BT4ME07P	TechnicalReport Writing	1	IV SEM
AEC-III	BT4ME08P	Communication Lab	1	

List of Open Electives (OE) offered by Management BOS

Open Elective Basket				
For Students of Electrical Engineering , Civil Engineering, Mechanical Engineering and Electronics &				
Course Category	Course Code	Name of Course	Credits	Semester
OE-I	BT3ME06T	Stress Management	3	III Semester
OE-II	BT4ME05T	Principles of Management	3	IV Semester
OE-III	BT5ME06T	IPR Development & Training	2	V Semester

List of MDM-II Basket for Mechanical Engineering Students offered by other Department.

Multidisciplinary Minor Offered by	Course Code	Name of Course	Credit	Semester
Minor in Electrical Engineering	BT4EE04T	Renewable Energy Studies	2	IV Semester
Minor in Civil Engineering	BT4CV04T	Environmental Engineering-I	2	
Minor in Electronics & Telecommunication Engineering	BT4ET04T	Digital Circuits	2	
Minor in Computer Science & Engineering	BT4CS04T	Database Management system	2	
Minor in Computer Engineering	BT4CE04T	Database Management system	2	
Minor in Artificial Intelligence & Data Science.	BT4AD04T	Database Management system	2	

P. Bawar
24/7/26
Dr. P. D. Sawarkar
VNITNGP

SRPCE-MECHANICAL ENGG.
24/7/26
Dr. A. H. Ingle
chairman

24/7/26
Dr. Y. M. Sonkhaskar
NGP
24/7/26
S. S. Pawar
24/7/26

24/7/26
Dr. S. R. Tumb
24/7/26
Atul. Tete

24/7/26
Dr. S. V. Borkar
24/7/26
(Rohel Takhar)

24/7/2026
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B.Tech. Semester-V Mechanical Engineering-NEP (Choise Based Credit System)
Major with Minor in Multidisciplinary

Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs./Week)			Total Hrs per Week	Total Credits	Examination Scheme						
					L	T	P			Exam. Hrs.	Theory		Practical		Min. Pass Marks	Tot. Marks
											CIE	ES E	CI E	ESE		
1	PCC-IX	BT5ME01T	Heat Transfer	MECH	3	—	—	3	3	3	40	60	—	—	50	100
2	PCC-IX	BT5ME02P	Heat Transfer Lab	MECH	—	—	2	2	1	—	—	—	25	25	25	50
3	PCC-X	BT5ME02T	Kinematics & Dynamics of Machines	MECH	3	—	—	3	3	3	40	60	—	—	50	100
4	PCC-X	BT5ME02P	Kinematics & Dynamics of Machines Lab	MECH	—	—	2	2	1	—	—	—	25	25	25	50
5	PCC-XI	BT5ME03T	Design of Machine Elements	MECH	2	—	—	2	2	2	20	30	—	—	25	50
6	PEC-I	BT5ME04T	Refer PEC-I Basket	MECH	3	—	—	3	3	3	40	60	—	—	50	100
7	PEC-I	BT5ME04P	Refer PEC-I Basket LAB	MECH	—	—	2	2	1	—	—	—	25	25	25	50
8	MDM-III	BT5ME05T	Refer MDM-III Basket	MECH	3	—	—	3	3	3	40	60	—	—	50	100
9	OE-III	BT5ME06T	Refer OE Basket	MGT	2	—	—	2	2	2	20	30	—	—	25	50
			Total		16		6	22	19		200	300	75	75		650

Cummulative Total Credits till B.Tech. V Semester =107

Theory 6 & Practical 3

P. Sawarkar
24/7/26
Dr. P. D. Sawarkar
VNIT NGP

Dr. Y. M. Sonkhoskar
24/7/26
Dr. Y. M. Sonkhoskar
RKNCE NGP

Dr. S. R. Tule
24/7/26
Dr. S. R. Tule

Dr. S. V. Borkar
24/7/26
Dr. S. V. Borkar

Dr. S. V. Borkar
24/7/26
Dr. S. V. Borkar

Chairman
24/7/26
SRPCE-MECHANICAL ENG.
Dr. A. H. Ingle

Atul Tete
24/7/26
Atul Tete

Res Takhalate
24/7/26
(Rahul Takhalate)

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24/7/26
S. S. Pawar

Effective from session:2026-27

**SMT. RADHIKATAI PANDAV COLLEGE
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RAHADURA NAGPUR**



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 Email : admin@srpce.ac.in • website : www.srpce.ac.in

B.Tech. Semester-V Mechanical Engineering-NEP (Choise Based Credit System) Major with Minor in Multidisciplinary

Programme Elective Courses - I:- PEC-I (Theory & Practical) Basket

Course Category	Domain	Course Code	Name of Course	Credits	Semester
Programme Elective Courses -I (PEC-I)	Design	BT5ME04T	Synthesis of Mechanism	3	III
		BT5ME04P	Synthesis of Mechanism Lab	1	
	Thermal	BT5ME04T	Refrigeration & Air Conditioning	3	
		BT5ME04P	Refrigeration & Air Conditioning Lab	1	
	Manufacturing	BT5ME04T	Metrology & Quality Control	3	
		BT5ME04P	Metrology & Quality Control Lab	1	

List of Open Electives (OE) offered by Management BOS

Open Elective Basket

For Students of Electrical Engineering , Civil Engineering, Mechanical Engineering and Electronics &

Open Elective -III:- OE-III Basket

Course Category	Course Code	Name of Course	Credits	Semester
OPEN ELECTIVE (OE-I)	BT3ME06T	Stress Management	3	III
OPEN ELECTIVE (OE-II)	BT4ME05T	Principles of Management	3	IV
OPEN ELECTIVE (OE-III)	BT5ME06T	IPR Development & Training	2	V

List of MDM-III Basket for Mechanical Engineering Students offered by other Department.

Multidisciplinary Minor offered by	Course Code	Name of Course	Credits	Semester
Minor in Electrical Engineering	BT5EE06T	Network Analysis	3	V
Minor in Civil Engineering	BT5CV05T	Environmental Engineering -II	3	
Minor in Electronics & Telecommunication	BT5ET05T	Microprocessor and Microcontroller	3	
Minor in Computer Science & Engineering	BT5CS05T	Fundamental of Computer Network	3	
Minor in Computer Engineering	BT5CE05T	Fundamental of Computer Network	3	
Minor in Artificial Intelligence & Data Science.	BT5AD05T	Fundamental of Computer Network	3	

P. Dewar
24/7/26
Dr. P.D. Sawarkar
VNIT NGP

Y.M. Sonkhaskar
24/7/26
Dr. Y.M. Sonkhaskar
R.KNCE NGP

S.R. Tulam
24/7/26
Dr. S.R. Tulam
Dr. S.V. Borkar

Bhaugane
24/07/2026

Chairman
24/7/26
SRPCE-MECHANICAL ENG. G.
Dr. A.H. Singh

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24/7/26
Atul Tete

R. Takhalate
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(Rahul Takhalate)

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Prof. S.J. Pawar

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B.Tech. Semester-VI Mechanical Engineering-NEP (Choise Based Credit System)Major with Minor in Multidisciplinary

Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs./ Week)			Total Hrs per Week	Total Credits	Examination Scheme						
					L	T	P			Exam.Hrs.	Theory		Practical		Min.P ass. Marks	Total Marks
											CIE	ESE	CIE	ESE		
1	PCC-XII	BT6ME01T	Thermal Engineering	MECH	3	—	—	3	3	3	40	60	—	—	50	100
2	PCC-XII	BT6ME01P	Thermal Engineering Lab	MECH	—	—	2	2	1	—	—	—	25	25	25	50
3	PCC-XIII	BT6ME02T	Mechanical Measurement & Metrology	MECH	3	—	—	3	3	3	40	60	—	—	50	100
4	PCC-XIII	BT6ME02P	Mechanical Measurement & Metrology LAB	MECH	—	—	2	2	1	—	—	—	25	25	25	50
5	PEC-II	BT6ME03T	Refer PEC-II Basket	MECH	3	—	—	3	3	3	40	60	—	—	50	100
6	PEC-II	BT6ME03P	Refer PEC-II Basket LAB	MECH	—	—	2	2	1	—	—	—	25	25	25	50
7	PEC-III	BT6ME04T	Refer PEC-III Basket	MECH	3	—	—	3	3	3	40	60	—	—	50	100
8	PEC-III	BT6ME04P	Refer PEC-III Basket LAB	MECH	—	—	2	2	1	—	—	—	25	25	25	50
9	MDM-IV	BT6ME05T	Refer MDM-IV Basket	MECH	3	—	—	3	3	3	40	60	—	—	50	100
10	VSEC-IV	BT6ME06P	Refer VSEC-IV Basket (SEC-II)	MECH	—	—	4	4	2	—	—	—	50	50	50	100
			Total		15		12	27	21		200	300	150	150		800

Cummulative Total Credits till B.Tech. VI Semester = 128

Theory 5 & Practical 5

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Dr. Y.M. Sonkhaskar
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RKNCE NGP

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Dr. S.R. Jilani

Dr. S.V. Borkar
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Dr. S.V. Borkar

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24/07/2026
Bhaugchane

Chairman
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Dr. A.H. Jingle

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24/7/26
Atul. Tete

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B.Tech. Semester-VI Mechanical Engineering-NEP (Choise Based Credit System)Major with Minor in Multidisciplinary

Programme Elective Courses - II:- PEC-II (Theory & Practical) Basket

Course Category	Domain	Course Code	Name of Course	Credits	Semester
Programme Elective Courses - II (PEC-II)	Design	BT6ME05T	Stress Analysis	3	VI
		BT6ME05P	Stress Analysis Lab	1	
	Thermal	BT6ME05T	Industrial Hydraulics & Pneumatics	3	
		BT6ME05P	Industrial Hydraulics & Pneumatics Lab	1	
	Manufacturing	BT6ME05T	Computer Aided Design & Computer Integrated	3	
		BT6ME05P	Computer Aided Design & Computer Integrated Manufacturing Lab	1	

Programme Elective Courses - III:- PEC-III (Theory & Practical) Basket

Course Category	Domain	Course Code	Name of Course	Credits	Semester
Programme Elective Courses - III(PEC-III)	Design	BT6ME06T	Finite Element Method	3	VI
		BT6ME06P	Finite Element Method Lab	1	
	Thermal	BT6ME06T	Solar Energy & its Utilization	3	
		BT6ME06P	Solar Energy & its Utilization Lab	1	
	Manufacturing	BT6ME06T	Additive Manufacturing	3	
		BT6ME06P	Additive Manufacturing Lab	1	

Vocational Skill Enhancement Courses -IV:- VSEC-IV Basket

Course Category	Course Code	Name of Course	Credits	Semester
Vocational Skill Enhancement Courses -IV	BT6ME08P	Career Development .	2	VI
	BT6ME08P	Application of Solar Energy.	2	
	BT6ME08P	CNC Practice .	2	
	BT6ME08P	Cyber Security .	2	

P. Sawarkar
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Dr. P.D.Sawarkar
VNIT NIGP

Dr. Y.M.Sonkhaskar
24/7/26
RKNCE NIGP

Dr. S.R. Dule
24/7/26

Dr. S.V. Borkar
24/7/26

Dr. K. B. Kharghane
24/07/2026

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Chairman
Dr. A. H. Ingole

Atul. Tete
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Dr. S. P. Retaichalake
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B.Tech. Semester-VII Mechanical Engineering-NEP (Choise Based Credit System)
Major with Minor in Multidisciplinary

Sr. No	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs./ Week)			Total Hrs per Week	Total Credits	Examination Scheme						
					L	T	P			Exam Hrs.	Theory		Practical		Min. Pass Marks	Tot. Marks.
											CIE	ESE	CIE	ESE		
1	R.M.	BT7ME01T	# Research Methodology	MECH	3	—	—	3	3	3	40	60	—	—	50	100
2	R.M.	BT7ME01P	# Research Methodology Lab	MECH	—	—	2	2	1	—	—	—	25	25	25	50
3	PCC-XIV	BT7ME02T	Automation In Production	MECH	3	—	—	3	3	3	40	60	—	—	50	100
4	PCC-XIV	BT7ME02P	Automation In Production Lab	MECH	—	—	2	2	1	—	—	—	25	25	25	50
5	PEC-IV	BT7ME03T	Refer PEC-IV Basket	MECH	3	—	—	3	3	3	40	60	—	—	50	100
6	PEC-IV	BT7ME03P	Refer PEC-IV Basket Lab	MECH	—	—	2	2	1	—	—	—	25	25	25	50
7	PEC-V	BT7ME04T	Refer PEC-V Basket	MECH	3	—	—	3	3	3	40	60	—	—	50	100
8	PEC-V	BT7ME04P	Refer PEC-V Basket LAB	MECH	—	—	2	2	1	—	—	—	25	25	25	50
9	Project	BT7ME05P	Project	MECH	—	—	8	8	4	—	—	—	100	100	100	200
			Total		12		16	28	20		160	240	200	200		800

Cummulative Total Credits till B.Tech.VII Semester =148

Theory 4 & Practicals 5

Note:- # Indicates that Online Courses to be done by the students from NPTEL/SWYAM/MOOC'S. Examination will be conducted by NPTEL/SWYAM/MOOC'S/Institute.

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 Dr. P. D. Sawarkar
 VNIT Nagpur

Dr. Y.M. Schkhaskar
 24/7/26
 Dr. Y.M. Schkhaskar
 RKNCE NEP

Dr. S.R. Dhar
 24/7/26
 Dr. S.R. Dhar

Dr. S.V. Borkar
 24/7/26
 Dr. S.V. Borkar

Chairman
 24/7/26
 SRPCE-MECHANICAL ENGG.
 Dr. A.H. Sawarkar

Atul Tete
 24/7/26
 Atul Tete

Dr. S. Pawar
 24/7/26
 Dr. S. Pawar

Restakhalite
 24/7/26
 (Rohit Talchade)

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B.Tech. Semester-VII Mechanical Engineering-NEP (Choose Based Credit System) Major with Minor in Multidisciplinary

Programme Elective Courses-IV:- PEC-IV Basket (Theory+Practical)

Course Category	Domain	Course Code	Name of Subject	Credits	Semester
Programme Elective Courses-IV (PEC-IV)	Design	BT7ME03T	Mechanical Vibrations	3	VII
		BT7ME03P	Mechanical Vibrations Lab	1	
	Thermal	BT7ME03T	Heating Ventilation and Air Conditioning	3	
		BT7ME03P	Heating Ventilation and Air Conditioning Lab	1	
	Manufacturing	BT7ME03T	Micro & Nano Machining	3	
		BT7ME03P	Micro & Nano Machining Lab	1	

Programme Elective Courses-V:- PEC-V Basket (Theory & Practical)

Course Category	Domain	Course Code	Name of Subject	Credits	Semester
Programme Elective Courses-V (PEC-V)	Design	BT7ME04T	Design of Transmission System.	3	VII
		BT7ME04P	Design of Transmission System Lab.	1	
	Thermal	BT7ME04T	Advanced I.C.Engines	3	
		BT7ME04P	Advanced I.C.Engines Lab	1	
	Manufacturing	BT7ME04T	Tool Engineering.	3	
		BT7ME04P	Tool Engineering Lab.	1	

P. Bawale
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 Dr. P. D. Sawarkar
 VNITNGP

Dr. Y. M. Sonkhaskar
 24/7/26
 Dr. Y. M. Sonkhaskar
 RKNCE NGP

Dr. S. R. Iyer
 24/7/26
 Dr. S. R. Iyer

Dr. S. V. Borikar
 24/7/26
 Dr. S. V. Borikar

Dr. R. D. Chougale
 24/07/2026
 Dr. R. D. Chougale

Chairman
 24/7/26
 SRPCE-MECHANICAL ENGG.
 Dr. A. K. ...

Atul Tete
 24/7/26
 Atul Tete

Restakhalate
 24/7/26
 (Rishul Talchade)

Principal
 24/7/26
 Principal

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B.Tech. Semester-VIII Mechanical Engineering-NEP (Choise Based Credit System)
Major with Minor in Multidisciplinary

Sr. No	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs./Week k)			Total Hrs per Week	Total Credits	Examination Scheme						
					L	T	P			Exa m.H rs.	Theory		Practical		Min. Pass. Mark	Tot. Marks
											CIE	ES E	CIE	ESE		
1	MDM-V#	BT8ME01T	Refer MDM Basket	MECH	2	—	—	2	2	2	20	30	—	—	25	50
3	MDM-VI#	BT8ME02T	Refer MDM Basket	MECH	2	—	—	2	2	2	20	30	—	—	25	50
5	Internship /OJT	BT8ME03P	Internship/On Job Training	MECH	—	—	24	24	12	—	—	—	200	200	200	400
			Total		8		30	38	16		40	60	200	200		500

Cummulative Total Credits till B.Tech.VIII Semestter = 164

Theory 2 (Online) Internship /OJT1

NOTE:- # Indicates that Online Courses to be done by the students from NPTEL/SWYAM/MOOCs. Examination will be conducted by NPTEL/SWYAM/MOOC's/INSTITUTE.

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Dr. P. D. Sawarkar
VNIT NGP

Dr. Y. M. Sonkhaikar
24/7/26
Dr. Y. M. Sonkhaikar
RKNCE NGP

Dr. S. R. Illu
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Dr. S. R. Illu

Dr. S. V. Borkar
24/7/26
Dr. S. V. Borkar

Dr. Chougane
24/07/2028
Dr. Chougane

Atul Tete
24/7/26
Atul Tete

Rehakhalate
24/7/26
(Rehakhalate)

Dr. A. H. Engle
24/7/26
Dr. A. H. Engle
Chairman

Dr. S. S. Pawar
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Dr. S. S. Pawar

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**B.Tech. Semester-VIII Mechanical Engineering-NEP (Choise Based Credit System) Major with
 Minor in Multidisciplinary**

List of MDM-V# Basket for Mechanical Engineering Students offered by other Department.

MDM-V # Courses to be done Online by students through NPTEL/SWYAM/MOOCs

Multidisciplinary Minor offered by	Course Code	Name of Course	Credit	Semester
Minor in Electrical Engineering	# BT8EE01T	Power Plant Engineering #	2	VIII
		Solar Power Plant Design #	2	
		EV Fundamentals #	2	
Minor in Civil Engineering	#BT8CV01T	Non conventional Energy Resources #	2	
		Building By laws & Building Regulation#	2	
		Building Services#	2	
Minor in Electronics & Telecommunication Engineering	#BT8ET01T	Internet of Things#	2	
		Analog & Digital Communication#	2	
		HDL&FPGA Based Design#	2	
Minor in Computer Science & Engineering	#BT8CS01T	Data Science	2	
Minor in Computer Engineering	#BT8CE01T	Data Science	2	
Minor in Artificial Intelligence & Data Science.	#BT8AD01T	Data Science	2	

List of MDM-VI # Basket for Mechanical Engineering Students offered by other Department.

MDM-VI # Courses to be done Online by students through NPTEL/SWYAM/MOOCs

Multidisciplinary Minor offered by	Course Code	Name of Course	Credit	Semester
Minor in Electrical Engineering	#BT8EE02T	Electricity & Safety Measures #	2	VIII
		Solar roof top: Design and Installation #	2	
		EV Components & Charging #	2	
Minor in Civil Engineering	#BT8CV02T	Environmental Economics & Management#	2	
		GIS & Remote sensing#	2	
		Constrution Planning & Management#	2	
Minor in Electronics & Telecommunication Engineering	#BT8ET02T	Wireless & Mobile Communication#	2	
		CMOS VLSI Circuit Design#	2	
		Wireless & Mobile Communication#	2	
Minor in Computer Science & Engineering	#BT8CS02T	Cyber Security	2	
Minor in Computer Engineering	#BT8CE02T	Cyber Security	2	
Minor in Artificial Intelligence & Data Science.	#BT8AD02T	Cyber Security	2	

P. Sawarkar
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 Dr. P. D. Sawarkar
 VNIT Nagpur

Y.M. Sonkhaskar
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 Dr. Y.M. Sonkhaskar
 RKNCE NGP.

S.R. Tete
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 Dr. S.R. Tete

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 Retalchale

Bharghava
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SRPCE Mechanical Engg.
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 Dr. A. Tete
 Chairman

A. Tete
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 Atul. Tete

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Multi-disciplinary Minor Courses offered by Mechanical Engineering
List of Multi-disciplinary Minor (MDM)-Basket

(This MDM Subjects for the students of other Brances Excluding Mechanical Engineering Students)

[This MDM Subject for the students of other Branches Excluding Mechanical Engineering]						
Sr. No.	Course Category	Semester	Course Code	Course Name	Credits	Minor
1	MDM-I	B.Tech.-III	BT3ME05T	Manufacturing Proesses.	2	Minor in Mechanical Engineering.
2	MDM-II	B.Tech.-IV	BT4ME04T	Basics of Thermal Engineering.	2	
3	MDM-III	B.Tech.-V	BT5ME05T	Fundamentals of Machine Design.	3	
4	MDM-IV	B.Tech.-VI	BT6ME05T	Refrigeration & Air Conditioning.	3	
5	#MDM-V	B.Tech.-VIII	#BT8ME01T	#Product Engineering & Design Thinking.(8Week)	2	
				#Advanced Robotic Applications. (8Week)	2	
				#Power Plant System Engineering.(12 Week)	2	
6	#MDM-VI	B.Tech.-VIII	# BT8ME02T	# Modelling & Simulation of Dynamic System.(8Week)	2	
				#Introduction to Abrasive Machining & Finishing Process.(8Week)	2	
				#Elements of Solar Energy Conversion.(12 Week)	2	
				Total Credits =	14	

NOTE:- # Indicates Online course to be done by students through NPTEL/SWYAM/MOOC's. Examination will be conducted by NPTEL/SWYAM/MOOC's/Institute.

NOTE:- # MDM-V Select any **one onlone** course out of given choises.

NOTE:- # MDM-VI Select any **one onlone** course out of given choises.

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R. KNCENGP.

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**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA, UMRER
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An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

**B.Tech. Mechanical Engineering/Civil Engineering/Electronics & Telecommunication
/Electrical Engineering (NEP) (CBCS)**

Sem-I	Total Hours Distribution Per Week		
Total Credits : 3	Lecture (L) : 3 Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT1ME01T/BT1CV01T/BT1ET01T/ BT1EE01T	Applied Mathematics-I	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
40 Marks	60 Marks	50	3 Hours

Course Objectives

1	Engineering Mathematics intent to equip first-year engineering students with fundamental mathematical tools.
2	To promote and develop the basic mathematics skills of engineering students that is essential for effective understanding of engineering subjects.

Course Outcomes

After completion of syllabus, students would be able to	
1	Learn the concept of successive differentiation; express the function in series form and evaluation of indeterminate forms.
2	Study the nature of linear system of equations using rank and identify the special properties of a matrix such as the eigen values, eigen vectors.
3	Understand the concept of Partial differentiation which is used to find the solution of real life problems.
4	Solve first-order ordinary differential equations applicable to engineering problems and apply it to formulate mathematical models for simple electrical circuits.
5	Understand and solve the different types of higher order differential equations by using various techniques and apply it to solve the problems in engineering field.

Dr. Yusuf Ousai
09/07/2026

Dr. D. Khar
09/07/2026

Dr. D. F. Shastri
09/07/2026

Dr. Ranjana Harane
09/07/2026

Ms. M. S. Palekar
09/07/2026

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SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1: Differential Calculus			
Successive differentiation: Leibnitz's Rule, Taylor's and Maclaurin's series for function of one variable, Indeterminate forms and L'Hospital's Rule.	7		1
Unit-2 Matrices			
Rank of a matrix, Consistency of linear system of non-homogeneous and homogeneous equations, Linear dependence of vectors, Eigen values and Eigen vectors, Cayley- Hamilton theorem (Statement only), Sylvester's theorem (Statement only).	8		2
Unit-3 Multivariable Calculus (Partial Differentiation)			
Functions of several variables, First and Higher order partial derivatives, Euler's theorem, Chain rule and Total differential coefficient, Jacobians, Lagrange's method of undetermined multipliers.	8		3
Unit-4 First Order Ordinary Differential Equations			
Review of Linear differential equations, Reducible to linear and Bernoulli's differential equations, Exact differential equations (Excluding the cases of integrating factors), Application of first order differential equation to simple electrical circuits.	5		4
Unit-5 Higher Order Ordinary Differential Equations			
Higher order ordinary linear differential equations with constant coefficients, Method of variation of parameters, Cauchy's and Legendre's homogeneous differential equations, Equations of the type $d^2y/dx^2 = f(y)$. Applications of higher order differential equations to simple electrical circuits.	8		5

Text/Reference Books:

- (1) Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
- (2) Ramana B.V., Higher Engineering Mathematics, Tata Mc-Graw Hill, New Delhi, 11th Reprint, 2010.
- (3) N.P. Bali and Manish Goyal, A Text Book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
- (4) B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
- (5) P. N. Wartikar and J. N. Wartikar, Applied Mathematics, Volume I and II.
- (6) H.K. Dass, Rama Verma, Rajnish Verma, V.J. Dagwal, Sajid Anwar and D.F. Shastrakar, Engineering Mathematics, Volume I and II, S. Chand.

(Dr. Ravi Kumar)

Dr. D.B. Shastri

Dr. Ranjana Harane

Mr. S. Palani

(Dr. S. Khanna)

**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA, UMRER
ROAD, NAGPUR**

An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

**B. Tech. First Semester Mechanical Engineering, Electrical Engineering, Electronics &
Telecommunication Engineering (NEP)**

Sem-I	Total Hours Distribution Per Week		
Total Credits : 3	Lecture (L) : 3 Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT1ME02T/ BT1EE02T/ BT1ET02T	Applied/ Engineering Physics	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
40 Marks	60 Marks	50	3 Hours

Course Objectives

1	To Provide a Strong Foundation in physics to provide technical knowledge
2	To gain an understanding of the phenomenon of interference used for advanced applications in optics
3	To familiarize prospective engineers with fundamental concepts of semi-conductors and their applications in semiconductor technology
4	To make acquainted with the laser technology and the operations of Laser

Course Outcomes

After completion of syllabus, students would be able to

1	Learn the basic concepts of the dual nature of matter and wave packet and apply them to analyze various relevant phenomena and to solve related numerical problems.
2	Apply concepts in interference and diffraction to solve relevant numerical problems and to relate to relevant engineering applications
3	Identify and explain different types of diodes, transistors, and its applications.
4	Learn and explain quantum transitions and apply them to the working of lasers.
5	Learn Various types of Crystal structures and its dimensions.

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Dr. C. V. Phadnis
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Dr. D. R. Shandekar
09/07/2026

[Signature]
Ashutosh Raut
09/07/26

[Signature]
Santosh Lande
09/07/2026

[Signature]
Ms. M. S. Palani
09/07/2026

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SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1 Quantum Mechanics			
De-Broglie Hypothesis, Concept of wave-particle duality, Matter Waves, Davisson-Germer Experiment. Compton effect, Photo electric effect, , Concept of wave packets, Heisenberg Uncertainty Principle, Significance of Wave function Ψ and normalization condition, Schrodinger wave equation (Expression for time dependent and time independent), Application to one dimensional infinite potential well. . & Numericals	7		1
Unit 2: Wave optics			
Huygen's principle, superposition of waves and interference of light by wavefront splitting and amplitude splitting, Interference in thin films, Expression for Interference in Wedge-shaped thin film, Newton's rings, Expression for radii(for Dark & Bright Band) and Anti-reflection coating. And its Derivation Numericals	7		2
Unit 3: Semiconductor Devices			
Basic idea of free electron theory of metals ,expression of conductivity of a metals Semiconductor, Classification, Pure and doped semiconductors. Types of Semiconductor diodes - P-N junction Diode, Tunnel Diode, Zener Diode, Light Emitting Diode (LED). Transistors and it's type PNP and NPN transistors, Hall Effect, Hall voltage, and Hall coefficient; its applications. & Numericals	8		3
Unit 4: Lasers			
Quantum Transitions: Absorption, Spontaneous emission & stimulated Emission, Metastable states, Principle of laser, Laser characteristics, Coherence length and coherence time, Pumping schemes: Three level and Four level. components of laser system ,Construction & working of He-Ne laser, Ruby laser, Applications of laser in Engineering & Numericals	7		4
Unit 5: Crystal Structure			
Meaning of lattice and basic ,Unit Cell: Primitive and non primitive Unit cell Cubic Crystal structure: simple cubic and body centered cubic and face centre cubic structure Unit cell characteristics: effective no of atoms per unit cell, atomic radius, nearest neighbor distance, coordinate number, Relation for Density atomic Packing fraction, Expression for Interplaner Spacing Crystal plane and miller indices, Braggs law of x ray diffraction, & Numericals	7		5

Dr. C. L. Khosla
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Dr. P. S. Palani
09/07/26

Ashutosh Raut
09/07/26

Dr. D. P. Shastri
09/07/26

Dr. S. Khan
09/07/26

Ms. M. S. Palani
09/07/2026

Contd.

Text/Reference Books:

1. P. M. Mathews and K. Venkatesan, A Textbook of Quantum Mechanics, Tata Mc Graw Hill (1977).
2. J. L. Powell and B. Crasemann, Quantum Mechanics, Narosa Publishing House (1993).
3. Applied Physics, M. N. Avdhanulu, Shilpa A. Pande, Arti R. Golhar, Mohan Giriya, S. Chand
4. D. J. Griffiths, Quantum mechanics, Prentice Hall of India Private Limited, New Delhi
5. Charles Kittel, Introduction to Solid State Physics, Wiley Eastern, 5th edition, (1983).
6. Engineering Physics - Dr.N. S. Ugemuge, Dr. (Mrs.) S.U.Bhonsule and Dr.ShrutiPatle DNA Publication(2019)
7. David Halliday, Robert Resnick, Jearl Walker, Principles of Physics, 10th Edition, John Wiley and Sons (2017)
8. A. J. Dekker, Solid State Physics, Prentice Hall of India (1971).
9. A Textbook of Engineering Physics, Dr. M. N. Avdhanulu, Dr. P. G. Kshirsagar, S. Chand Publication
10. A Text Book of Engineering Physics Dr. DevashreeHardas & Dr. Ashish Panat, Das Ganu Publication ISBN-978-81-921757-7-5 (2011)
11. Applied Physics, - Dr. (Mrs.)S.P. Wankhede, Dr.ShrutiPatle, Dr.(Mrs.)S.U.Bhonsule and Dr.N. S. Ugemuge DNA Publication ISBN-978-81-945174-6-7 (2020)
12. Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles by R. Eisberg and R. Resnick, Wiley and Sons
13. Text book of Applied Physics, Dr. D. S. Hardas, Dr. D. S. Bhoomik, Dr.S. Shastri, Das Ganu Publication ISBN-978-93-84336-59-2 (2021)
14. Engineering Physics, second edition, Sanjay Jain, G. Sahasrabudhe, University's Press(India) Pvt. Ltd.(2016)
15. L. I. Schiff, Quantum Mechanics, TMH Publications
16. Advanced Engineering Materials - Dr. Sangeeta G. Itankar, Dr. Manjusha Dandekar, Dr. Tushar R. Shelke, Dr. Swati Fartode, Alliance & Co. ISBN 978-93-91322-12-0 (2023)
17. Applied Physics- Dr. Sangeeta G. Itankar, Dr. Manjusha Dandekar, Dr. Tushar R. Shelke, Dr. Swati Fartode, Alliance & Co. ISBN 978-93-91322-97-7 (2023)
18. Advanced physics - Dr. Shruti Patle, Dr.(Mrs.)S.U.Bhonsule, Dr.Ashish N. Bodhaye, Dr.ManoharD.Mehare DNA Publication (2019)
19. Text book of Advanced Engineering Physics – Alliance & Company Publication by Dr. Chandrakant Khobragade (2025-26)

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Ashutosh Raut

Madhus
Mrs. M. S. Patil
09/07/2026

Dr. D. P. Shastri
09/07/2026

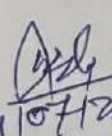
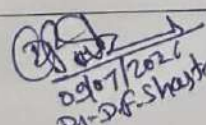
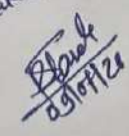
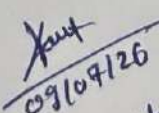
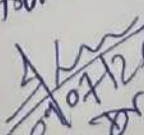
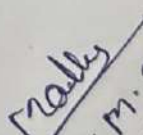
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**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA,
UMRER ROAD, NAGPUR**
An Autonomous Institute Affiliated to RTMNU, Nagpur
Faculty of Science & Technology
**B.Tech. First Semester Mechanical, Electrical, Electronics & Telecommunication
Engineering (NEP) (Practical) (CCECS)**

Sem-I	Total Hours Distribution Per Week		
Total Credits : 1	Lecture (L) : 0 Hrs	Tutorial/Activity (T/A) : 2 Hrs	
Subject Code	BT1ME02P/BT1EE02P /BT1ET02P	Applied/Engineering Physics Lab	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
25 Marks	25 Marks	25	3 Hours

List of Experiments: Performance of at least eight experiments is compulsory in a semester.

Name of the Experiments	
1	Energy gap of semiconductor /thermistor.
2	To Study the V-I characteristics of PN junction diode.
3	To Study the V-I characteristics of Zener diode.
4	To Study the Input/Output of PNP/NPN transistor in CB and CE mode
5	To Study the V-I Characteristics of Tunnel diode..
6	To Study V-I Characteristics of Light Emitting Diodes/ Determination of Plank's constant by using LEDs.
7	Study the Diode rectification
8	Study of Hall Effect and determination of Hall Voltage of a given sample.

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9	To determine the Hall coefficient (RH) with temperature
10	To study the B-H curve and find out the values of coercivity, retentivity, and saturation magnetization of the experimental material..
11	Determination of NA in optical fiber
12	Calibration of Time Base circuit of CRO and determination of AC, DC voltage & frequency of electrical signals using CRO
13	To determine the Wavelength of laser by using diffraction grating
Virtual Lab	
14	Experiment on the determination of the thickness of a thin foil using an air wedge arrangement
15	Experiment on the determination of the refractive indices of the material corresponding to ordinary and extra - ordinary rays.

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Dr. D. F. Shastri

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Dr. C. L. Chakrabarty

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Dr. S. Khan

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Ashutosh Raut

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09/07/2026
Mr. M. S. Pal

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING NAGPUR
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 AFFILIATED TO RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR
FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. MECHANICAL ENGINEERING

Course Category	Engineering Science Course -I (ESC-I)			
Sem : I	Total Hours Distribution per week			
Total Credit: 03	Lecture (L): 03 Hrs.	Tutorial/Activity(T/A): -----Hr.		
Course Code	BT1ME03T	Course :- Engineering Graphics		
Examination Scheme				
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Total Marks	Minimum Passing Marks	Examination Duration
40	60	100	50	3 Hours

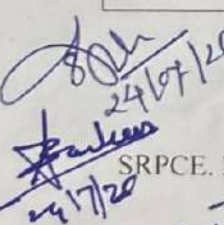
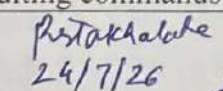
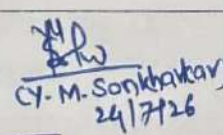
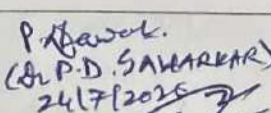
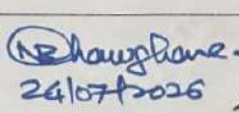
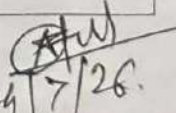
Course Objectives

1	Understand the fundamentals of Engineering Graphics, including drawing instruments, line types, dimensioning techniques, scales, sheet layout, engineering curves, and the basics of orthographic projection, as well as the projection of points and lines.
2	Develop the ability to draw projections of planes and solids by understanding the principles of orthographic projection and generating different projection views accurately.
3	Interpret and create orthographic views by converting pictorial representations into accurate two-dimensional (2D) engineering drawings.
4	Apply visualization skills to construct simple isometric views and isometric projections from given orthographic views in accordance with engineering drawing standards.

Course Outcomes

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

CO1	Draw various engineering curves such as ellipse, parabola, hyperbola, cycloid, involutes, and spiral using standard construction methods and also draw types of scales.
CO2	Draw projections of straight lines in different positions with respect to the principal planes. And Draw projections of plane surfaces inclined to one or both reference planes.
CO3	Draw projections of various solids such as cube, prisms, pyramids, cylinders, and cones in different orientations.
CO4	Prepare accurate front, top, and side views of machine components.
CO5	Convert orthographic views into isometric views, Construct accurate isometric projections using the isometric scale and Use the CAD interface efficiently by applying basic drawing and editing commands.

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SRPCE, MECHANICAL ENGG. 24/7/26
 Dr. A.H. Ingole
 Chairman BOS

Version:-1

PRINCIPAL
 SMT. RADHIKATAI PANDAV COLLEGE
 OF ENGINEERING
 NAGPUR

Effective from session 2026-27

Contents

Unit I: Introduction to Engineering Graphics :

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SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING NAGPUR**AN AUTONOMOUS INSTITUTE**

AFFILIATED TO RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

**FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. MECHANICAL ENGINEERING**

Course Category	Engineering Science Course -I (ESC-I)			
Sem:I	Total Hours Distribution per week			
Total Credit: - 01	Practical(P): - 02 Hrs	Tutorial/Activity(T/A): - ----Hr.		
Course Code	BT1ME03P	Course :- Engineering Graphics		
Examination Scheme				
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Total Marks	Minimum Passing Marks	Examination Duration
25	25	50	25	-----Hours

Course Outcomes

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

CO1	Draw various engineering curves such as ellipse, parabola, hyperbola, cycloid, involutes, and spiral using standard construction methods and also draw types of scales.
CO2	Draw projections of straight lines in different positions with respect to the principal planes. And Draw projections of plane surfaces inclined to one or both reference planes.
CO3	Draw projections of various solids such as cube, prisms, pyramids, cylinders, and cones in different orientations.
CO4	Prepare accurate front, top, and side views of machine components.
CO5	Convert orthographic views into isometric views, Construct accurate isometric projections using the isometric scale and Use the CAD interface efficiently by applying basic drawing and editing commands.

Sr. No.	Drawing sheet Practice Guidelines
1	Follow BIS/IS standards for line types, dimensioning, lettering, and first-angle projection.
2	Use proper drawing instruments to ensure neatness, accuracy, and clarity
3	Each drawing sheet should include the student's name, roll number, assignment number, date, and title.
4	Submit assignments on or before the specified deadline.
5	Evaluation will be based on accuracy, neatness, correct construction, proper dimensioning, and adherence to engineering drawing standards.

Dr. A.H. Ingle
Chairman BOS
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24/7/26
Version:-1

R. S. Pawar
24/7/26
24/7/26

Dr. D. D. Dhangane
24/07/2026
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ENGINEERING
NAGPUR
Effective from session 2026-27

List of Practical's

All the following practicals shall be performed:

Sr. No.	List of Practical's
01	SHHET NO :- 01: SCALES
02	SHHET NO :- 02: ENGINEERING CURVES-01
03	SHHET NO :- 03: ENGINEERING CURVES-02
04	SHHET NO :- 04: PROJECTION OF STRAIGHT LINES
05	SHHET NO :- 05: PROJECTION OF PLANES
06	SHHET NO :- 06: PROJECTION OF SOLIDS
07	SHHET NO :- 07: ORTHOGRAPHIC PROJECTION
08	SHHET NO :- 08: ISOMETRIC VIEWS & PROJECTION.
09	SHHET NO :- 09: CAD -01
10	SHHET NO :- 10: CAD -02.

References:

Text Books Recommended:

- 1 Bhatt .N.D. and Panchal V.M. (2016) "Engineering Drawing", Charotar Publications Anand, India
2. Dhawan R.K. (2000) "A Textbook of Engineering Drawing", S.Chand, New Delhi.

Reference Books Recommended:

1. Jolhe D.A. (2015) ,"Engineering Drawing", Tata McGraw Hill, New Delhi. 2. Shah P.J., (2012), "Basics of Engineering Graphics", S.Chand, New Delhi 3. P.S.Gill, (2015), "Engineering Drawing", S.K.Kataria and Sons.

Note:

1. Conduct all practical's from the above list.
2. Viva-voce question should be included in each of the practical.
3. Continuous Internal Evaluation (CIE) 25 internal practical marks will be distributed as a 10 marks for regular drawing sheets, 10 marks for final submission of portfolio with viva-voce and 05 marks for attendance.
4. End Semester Examination (ESE) 25 external practical marks are distributed as a external practical performance must be for 15 marks and 10 Marks for viva-voce.
5. For Eligibility of ESE Practical examination, internal submission of drawing sheets with Portfolio is mandatory.

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24/7/26
Dr. A.H. Ingle
Chairman BOS

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S.S. Pawar
24/7/26

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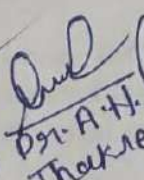
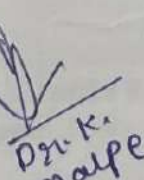
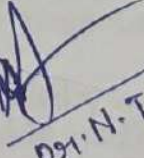
SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING NAGPUR
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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. MECHANICAL ENGINEERING

Course Category	Engineering Science Course -II (ESC-II)		
Sem: I	Total Hours Distribution per week		
Total Credit: - 01	Practical (P): - 02 Hrs	Tutorial/Activity(T/A): ---	
Subject Code	BT1ME04P (Practical)	Basic of Computer C Programming LAB	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	End Semester Exam (ESE) Marks	Minimum Passing Marks	Examination Duration
25	25	25	----

Course Outcomes

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

CO1	Develop and execute basic C programs using variables, data types, arithmetic operators, and input/output functions to solve simple engineering problems.
CO2	Apply decision-making statements (if, if-else, nested if-else, switch-case) and looping constructs (while, for, do-while) to implement logical and repetitive programming tasks.
CO3	Design and implement C programs using arrays, strings, and user-defined functions for solving computational problems.
CO4	Develop modular C programs using functions, recursion, and structures to solve engineering applications efficiently.


 P. B. Jaisankar

 Dr. A. H. Thakre

 Dr. K. Malpe

 Dr. N. T. Gole

Minimum Eight out of the following practical's shall be performed:

List of Practical's

Sr. No.	List of Practical's
01	Write a C Program to print hello world.
02	Write a C program to find sum and average of three numbers.
03	Write a C program to generate the first n terms of the Fibonacci sequence.
04	Find a Largest of Three Numbers in C Using Nested if Else.
05	Write a C program to store the information of Students using a Structure.
06	Write a C Program for Check Character Is Vowel Or Not Using If Else.
07	Write a C Program to Find Sum of Natural Numbers Using While Loop.
08	Write a C Program to find Reverse a Number Using FOR Loop.
09	Write a C program to perform arithmetic operations using switch statement.
10	Write a C program to perform addition of two matrices.

Note:

1. Conduct minimum 08 practical's out of above list and practical no. 1 is mandatory.
2. Viva-voce question should be included in each of the practical.
3. During Continuous Internal Evaluation (CIE) practical Marks, regular performance of practicals for 10 marks, 05 Marks for Journal submission and 10 Marks for internal viva-voce examination.
4. During Semester End Exam (SEE) practical Marks, external practical examination performance must be conducted for 15 marks and 10 Marks for viva.
5. For Eligibility of SEE Practical examination, Internal submission of Journal (Practical File) is mandatory.



Sanmarg Shikshan Sanstha's
SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING
AN AUTONOMOUS INSTITUTE
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Recognized by Government of Maharashtra & AICTE New Delhi
Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
Near Dighori Naka, Umrer Road, Nagpur - 440 034
Mob. : 9881014701, 9823464644, 8983550843
Email : admin@srpce.ac.in • website : www.srpce.ac.in

FACULTY OF SCIENCE & TECHNOLOGY

DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION ENGINEERING

**B.TECH. I SEMESTER COMPUTER ENGINEERING/ ARTIFICIAL INTELLIGENCE &
DATA SCIENCE ENGINEERING /COMPUTER SCIENCE ENGINEERING/
MECHANICAL ENGINEERING-Major (NEP) (CBCS)**

Course Category:	Engineering Science Course (ESC-III)		
Semester: I	Total Hours Distribution per week		
Total Credit: 03	Lecture (L): 3 Hrs.		Tutorial (T): 0 Hr.
Subject Code & Subject Name:	BT1CE05T / BT1AD05T/ BT1CS05T/ BT1ME05T		Basics of Electrical and Electronics Engineering
EXAMINATION SCHEME			
Continuous Internal Evaluation (CIE)Marks	End Semester Examination (ESE) Marks	Minimum Passing Marks	Examination Duration
40	60	50	3 Hours

COURSE OBJECTIVES:

1. **Recall** the fundamental electrical circuit elements, sources, and principles of DC circuit analysis.
2. **Recall** the basic concepts of AC signals, waveforms, and AC circuit analysis.
3. **Define** the fundamental semiconductor devices, diodes, rectifiers, and transistors.
4. **Describe** the basic concepts of digital logic and microprocessor architecture.
5. **List** the fundamental measurement systems, sensors, transducers, and Programmable Logic Controllers (PLCs).

COURSE OUTCOMES:

1. **Recognize** the basic electrical laws and circuit reduction techniques used in DC circuits.
2. **Recognize** the concepts of AC waveforms, phasors, impedance, power, and power factor.
3. **Identify** the operation and applications of semiconductor diodes, rectifiers, Zener diodes, and BJTs.
4. **State** the basic logic gates, combinational circuits, and the architecture of the 8085 microprocessor.
5. **Identify** the principles and applications of measurement systems, sensors, transducers, and PLCs.

Dr. Shital B. Chavhan
Dr. N. G. Hawale
Dr. P. S. Lanum
Dr. P. Agarkar

SYLLABUS

Unit I: Circuit Elements and Parameters- (10 Hrs.)

Active and passive elements, Ideal and practical voltage and current sources, source transformation;

DC Circuits: Types Series, Parallel, Star, Delta and transformation, Energy Sources and Circuit Reduction, Kirchhoff's Laws & Applications, Ohm's laws.

Unit II: AC Circuits & Fundamentals- (08 Hrs.)

Common signals and their waveforms; instantaneous, peak, average, and RMS values; peak factor and form factor of sinusoidal wave; Study of A.C circuits of pure resistance, inductance and capacitance and corresponding voltage-current phasor diagrams; Impedance and Admittance; Power, Power factor and Power Triangle.

Unit III: Diodes and Transistor (10 Hrs.)

Introduction to Semiconductor P-N junction diodes, Biasing and Characteristics of diodes, Zener Diode, Zener diode as a voltage regulator, Photodiode, LED.

Rectifier- Half Wave Rectifier, Full wave Rectifier.

Introduction to BJT, NPN and PNP Transistor, Mode of operation.

Unit IV: Digital Circuits (08 Hrs.)

Analog vs Digital System, Basic Logic Gates (AND, OR, NOT) their Truth Tables, Universal Logic Gates (NAND, NOR) Introduction to Combinational Circuits – Adder and Subtractor.

Introduction to 8085 Microprocessor - Architecture.

Unit V: Electronics Measurement, Sensors and Instruments (08 Hrs.)

Introduction to Measurement System, Generalized block diagram of Measurement system, Static and Dynamic characteristic of measurements System, Measurement Errors and Accuracy.

Sensors and Transducers: Temperature Sensors (RTD, Thermistor, Thermocouple),

Pressure Sensors, Electro mechanical Instruments (PMMC), LVDT

Introduction to PLC (Programmable Logic Controller).

Text Books: -

1. D. P. Kothari & I. J. Nagrath, Basic Electrical Engineering, McGraw Hill Education.
2. Rajendra Prasad, Fundamentals of Electrical Engineering, PHI Learning Pvt. Ltd.
3. V. N. Mittle & Arvind Mittle Basic Electrical Engineering, McGraw Hill Education.
4. V. K. Mehta, Rohit Mehta, Principal of Electronics S. Chand Publication.
5. Electronic Devices and Circuits - S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, McGraw Hill Education.
6. R. P. Jain, 'Digital Electronics' McGraw Hill Education.
7. Ramesh S. Gaonkar, Microprocessor Architecture, Programming and Applications with the 8085, McGraw Hill Education.
8. Jon Stenerson, Industrial Automation and Process Control, Pearson Education.
9. A. K. Sawhney and Puneet Sawhney, Electrical and Electronics Measurements and Instrumentation, Chanpat Rai and Co.

Reference Books: -

1. William H. Hayt Jr., Jack E. Kemmerly & Steven M., Engineering Circuit Analysis, 10th Edition McGraw Hill Education.
2. James W. Nilsson & Susan A. Riedel, Electric Circuits- Pearson Education.
3. M. E. Van Valkenburg, Network Analysis, Pearson Education.
4. Anand Kumar, Fundamentals of Digital Circuits, PHI Learning.
5. K. Udaya Kumar & B. S. Umashankar, The 8085 Microprocessor: Architecture, Programming and Interfacing, Pearson Education
6. John W. Webb & Ronald A. Reis. Programmable Logic Controllers: Principles and Applications, Pearson Education.

~~Army Reserve~~

Agarwal
Dr. P. Agarwal

Dr. P. S. Lakshman
Dean (Acad)

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Digital B.O.S. chaitpeeson
SRPCE-ETC

Dr. H. E. Nawle



Sanmarg Shikshan Sanstha's
SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING
AN AUTONOMOUS INSTITUTE
NAAC ACCREDITED

Recognized by Government of Maharashtra & AICTE New Delhi
Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
Near Dighori Naka, Umrer Road, Nagpur - 440 034
Mob. : 9881014701, 9823464644, 8983550843
Email : admin@srpce.ac.in • website : www.srpce.ac.in

FACULTY OF SCIENCE & TECHNOLOGY

DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION ENGINEERING

**B.TECH. I SEMESTER COMPUTER ENGINEERING/ ARTIFICIAL INTELLIGENCE &
DATA SCIENCE ENGINEERING /COMPUTER SCIENCE ENGINEERING/
MECHANICAL ENGINEERING-Major (NEP) (CBCS)**

Course Category:	Engineering Science Course (ESC-III)		
Semester: I	Total Hours Distribution per week		
Total Credit: 01	Lab (P): 2 Hrs.		Tutorial (T): 0 Hr.
Subject Code & Subject Name:	BT1CE05P / BT1AD05P/ BT1CS05P/ BT1ME05P		Basics of Electrical and Electronics Engineering
EXAMINATION SCHEME			
Continuous Internal Evaluation (CIE)Marks	End Semester Examination (ESE) Marks	Minimum Passing Marks	Examination Duration
25	25	25	-----

COURSE OBJECTIVES:

1. To understand the basics of DC circuits, electrical components, sources, network laws, and simple circuit analysis methods.
2. To learn the basic concepts of AC circuits, waveforms, phasors, impedance, admittance, and power calculations.
3. To study the working and characteristics of semiconductor devices like PN junction diodes, Zener diodes, and transistors through experiments.
4. To learn the fundamentals of digital electronics, logic gates, combinational circuits, and the basic operation of the 8085 Microprocessor.
5. To understand measurement systems, sensors, transducers, and basic PLC techniques used in industrial automation.

COURSE OUTCOMES:

1. Students will be able to solve basic DC circuits using Ohm's law, Kirchhoff's laws, source transformation, and network reduction methods.
2. Students will be able to analyze simple AC circuits, calculate electrical quantities, and understand power and phasor relationships in R, L, and C circuits.

3. Students will be able to study the V-I characteristics of PN and Zener diodes, understand voltage regulation, and analyze transistor characteristics.
4. Students will be able to understand and analyze basic logic circuits, design simple combinational circuits, and explain the working of the 8085 Microprocessors.
5. Students will be able to understand measurement systems, study sensor characteristics, and develop basic PLC ladder programs for control applications.

SYLLABUS

LIST OF EXPERIMENTS

1. To measure Voltage, current and power in single phase circuit with resistive load.
2. To measure Voltage, current and power in single phase circuit with R-L load.
3. Determine transformer ratio (K) of single-phase transformer.
4. To study the forward and reverse bias V-I characteristics of a P-N junction diode and determine the cut-in (knee) voltage.
5. To obtain the V-I characteristics of a Zener diode and verify its operation as a voltage regulator.
6. To study the input and output characteristics of an NPN/PNP transistor in Common Emitter (CE) configuration and identify its regions of operation.
7. To verify the truth tables of **AND, OR, NOT, NAND, and NOR** gates and demonstrate the implementation of basic gates using universal gates (NAND and NOR).
8. To implement and verify the operation of a **Half Adder** and **Half Subtractor** using logic gates.
9. To study the **static characteristics** of a measurement system, determine measurement errors and accuracy.
10. To study the characteristics of **RTD, Thermistor, Thermocouple, and LVDT**, and compare their performance.
11. To study the basic operation of a **Programmable Logic Controller (PLC)** and develop simple ladder Logic programs for industrial control applications.

Dr. Shital V. Wale
BOS chairperson

Dr. N. A. Kulkarni

Dr. N. A. Kulkarni

Dr. P. S. L. Amjekar
Dean (Ac.)

Dr. P. Agarkar

**B. Tech. Mechanical Engineering/Civil Engineering/Electrical Engineering/
Electronics & Telecommunication/ Computer Engineering/ Computer Science &
Engineering (NEP) (CBCS)**

Sem-I	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L): 2Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT1ME06T/BT1CV06T/BT1EE05T /BT1ET07T/BT1CE07T/BT1CS07T	Communication Skill	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
20 Marks	30 Marks	25	2 Hours

Course Objectives	
1	To apply tools and techniques for better communication.

Course Outcomes	
After completion of syllabus, students would be able	
1	To apply grammatically correct formation of sentences.
2	To make use of verbal and non verbal communication effectively.
3	To identify and overcome barriers to communication.
4	To apply Public speaking and extempore skills.

09/07/2026

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09/07/2006

Dr. D. R. Shastri
09/07/2026.

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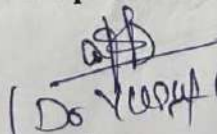
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(Dr. Monsumi Aich)
9/7/2016

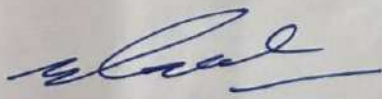
SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1 : Grammar & Composition			
Subject-Verb Agreement <u>Types Of Tenses</u> & Question Tags, Voice: Active & Passive. <u>Narration</u> : Direct & Indirect. <u>Types Of Sentences</u> : Simple, Compound & Complex Sentences Imperative, Affirmative, Negative & Interrogative. <u>E-Mail Etiquettes, Paragraph & Letter Writing.</u>	6		1
Unit 2:			
Communication Nature & Process, Types Of Communication (Verbal & Non-Verbal), Effective Communication, Types Of Verbal (Written & Oral), Types Of Non-Verbal Communication (Kinesics, Vocalics, Paralanguage, Chronemics, Haptics, Proxemics)	6		2
Unit 3			
Barriers To Communication, Types Of Barriers & Remedies. 7 C's Of Communication (Clear, Concise, Correct, Coherent, Complete & Courteous)	6		3
Unit 4:			
Public Speaking, Necessary Components, Do's & Don'ts, Reading, Hearing, Listening & Debating Skills. Group Discussion: Necessary Components, Do's & Don'ts.	6		4

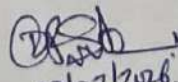
Text/Reference Books: -

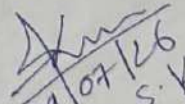
- 1) High School English Grammar & Composition by Wren & Martin. S. Chand & Company Ltd.
- 2) Professional Communication Skills. Dr. A.K. Jain, Dr. Pravin S.R. Bhatia Dr. A. M. Sheikh. S. Chand & Company Ltd.
- 3) Functional English. Dr. M. Sabir. Das Ganu Prakashan,
- 4) Functional English For Technical Students. Dr. Pratibha Mahato, Dr. Dora. Thompson. Himalaya Publishing House.

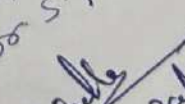

(Dr. Yusuf Qureshi)

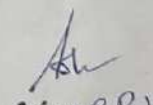

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Dr. Anil V. Musale


09/07/2026
Dr. D. F. Shastri


09/07/26
Dr. S. Khan


09/07/2026
M. S. Patil


9/7/2026
(Dr. Moumini Aich)

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING NAGPUR
AN AUTONOMOUS INSTITUTE
 AFFILIATED TO RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR
FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. MECHANICAL ENGINEERING

Course Category	Vocational & Skill Enhancement Course(VSEC-I) Vocational Skill Course –I(VSC-I)			
Sem: I	Total Hours Distribution per week			
Total Credit: - 02	Practical(P): - 04Hrs	Tutorial/Activity(T/A): - --Hr.		
Course Code:-	BTIME07P	Course:- Workshop Practice		
Examination Scheme				
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Total Marks	Minimum Passing Marks	Examination Duration
50	50	100	50	-

Course Outcomes

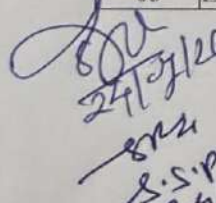
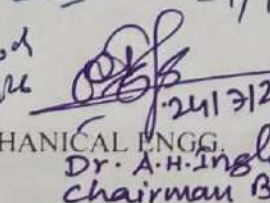
After successful completion of this course the student will be able to:

CO1	know the importance of general safety precautions on different shop floors.
CO2	Identify the basics of tools and equipments used in fitting, carpentry ,welding, piping and electric fitting .
CO3	Do fabrication of wooden joints and understand joining of metals
CO4	Understand the basics of removal of material from work piece surface to attain specific shape.

List of Practical's

The following Practical's shall be performed:

Sr. No.	List of Practical's
01	Carpentry : Safety precaution, Kinds of wood and timber, Application of timber as per their classification, Carpentry hand tools and machines, Different types of carpentry joint, Demonstration of wood working
02	Welding : Safety precaution in welding shop, Introduction to gas and arc welding, Soldering and brazing etc. Welding equipment and welding material.
03	Fitting : Safety precaution, Introduction to fitting shop tools, Equipment, Operation and their uses, Marking and measuring practice.
04	Piping(Plumbing): Safety precautions, Equipment Used for Piping, Tools used for piping
05	Electric Fittings : Safety precautions, Tools used for electric Fitting.

 24/7/26
 24/7/26
 SRPCE, MECHANICAL ENGG.
 Dr. A.H. Ingle
 Chairman BOS

Retakhalote P. Pawar.
 24/7/26 (R.P.D. SAWARKAR)
 24/7/26

Bhargava.
 24/07/2026

24/7/26, 24/7/26

VERSION:1.0

PRINCIPAL
 SMT. RADHIKATAI PANDAV COLLEGE
 OF ENGINEERING
 NAGPUR
 from Session:2026-27

Text Books:

1. S K Hajra Choudhury, A K Hajra Choudhury, N. Roy. *Workshop Technology Vol I & II*, Media Promoters & Publishers Pvt. Ltd; 9/e.

Reference Books:

1. H S Bawa. *Workshop Practice*, McGraw Hill Education; 2nd edition, 2/e.

Note:

1. Conduct All 05 practical's from above list and **practical job of welding, carpentry, fitting pipping is Compulsory**.
2. Viva-voce question should be included in each of the practical.
3. **Continuous Internal Evaluation (CIE)**, 50 internal practical marks are distributed as 24 marks for four shop job preparation, 16 marks for final submission with viva-voce examination & 10 marks for attendance.
4. **End Semester Examination (ESE)**, 50 external marks are distributed as 30 marks for performance of job and 20 marks for viva-voce examinations.
5. For Eligibility of ESE Practical examination, **Internal submission of All four jobs & Journal (Practical File)** is mandatory.

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Retuchalake P. Bawa.
24/7/26 (Dr. P. D. SAWARKAR)
24/7/2026

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24/7/26
Dr. A. H. Ingle
Chairman BOS (Mech)

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S. S. Pawar
24/7/26

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PRINCIPAL
SMT RADHIKATAI PANDAV COLLEGE
OF ENGINEERING
BAHADURA (NAGPUR)

**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA, UMRER
ROAD, NAGPUR**

An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

**B.Tech. Mechanical Engineering/Civil Engineering/Electronics & Telecommunication
/Electrical Engineering/**

Computer Science & Engineering/Computer Engineering (NEP) (CBCS)

Sem-I	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L) :	Tutorial/Activity (T/A) : 4Hrs	
Subject Code	BT1ME08P/BT1CV08P/ BT1ET08P/BT1EE08P/BT1C S08P/BT1CE08P	CC Basket-I (Games & Sports)	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
100 Marks	-	50	-

Course Objectives	
1	Improved knowledge of rules and strategies of particular games and sports.
2	To develop physical fitness, strength, flexibility, and coordination.

SYLLABUS

•**Basics of Games and Sports:** History of games, Classification of games, Importance of games.

•**Indoor Games:** Chess, Carrom, Table-Tennis and Badminton.

•**Outdoor Games:** Cricket, Football, Volleyball, Athletic (track and field), Kabaddi, Tug of war.

•**Role of Sports in Education and Society:** Physical benefits, Safety measure and Injury prevention, Emotional & Mental health.

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Dr. D. Khan
09/07/2026

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Dr. D. F. Shastri
09/07/2026

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Sandeep R. Grandhe

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N. M. S. P. P. P.
09/07/2026

**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA, UMRER
ROAD, NAGPUR**

An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

B.Tech. Mechanical Engineering (NEP) (CBCS)

Sem-II	Total Hours Distribution Per Week		
Total Credits : 3	Lecture (L) : 3 Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2ME01T	Applied Mathematics-II	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
40 Marks	60 Marks	50	3 Hours

Course Objectives

1	To introduce the basic concepts of solving algebraic, transcendental equations, Simultaneous and Differential equations.
2	To understand techniques of interpolation, polynomial fitting, numerical differentiation and integration.

Course Outcomes

After completion of syllabus, students would be able to

1	The concept to solve the Algebraic and Transcendental Equations.
2	Solve the simultaneous linear equations.
3	To apply the different methods to solve Ordinary differential equations.
4	Understand the application of Laplace Transform & Fourier Transform in solving Differential and Integral Equations.
5	To understand the concept to solve the problems on unequal interval, numerical differentiation and numerical integration.

Contd.

Handwritten: 09/07/2026
Dr. Y. V. Patil

Handwritten: 09/07/2026
Dr. S. V. Patil

Handwritten: 09/07/2026
Dr. S. V. Patil

Handwritten: Dr. R. V. Harane

SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1: Solution of Algebraic and Transcendental Equations			
Types of iterative methods: Bisection method, Method of False position, Newton Raphson method and their convergence, Newton Raphson method for multiple roots, Direct iteration method.	7		1
Unit 2: Solution of system of simultaneous linear equations			
Gauss elimination method, Gauss Seidel method, Gauss Jordan method, Crout's method Largest Eigen value and its corresponding Eigen vector by iteration method.	7		2
Unit 3: Numerical solution of Ordinary differential equations			
Taylor's series method, Picards method, Euler's modified method, Runge Kutta method of 4th order, Milne's Predictor-Corrector method, Runge Kutta method to solve simultaneous first order differential equations.	8		3
Unit 4: Laplace Transform & Fourier Transform			
Laplace Transform: Definition and Properties with examples, Inverse Laplace Transform, Convolution theorem (Statement only), Unit step function and Periodic Function, Application of Laplace Transform to solve Ordinary Differential Equation, Integral and Integro-Differential Equations.	8		4
Fourier Transform: Definition & Properties, Fourier Integral, Application of Fourier Transform to solve Integral Equation.			
Unit-5: Finite Differences, Numerical Differentiation and Integration			
Lagranges interpolation formula for unequal intervals, Numerical Differentiation: Newton's Forward and Backward difference Numerical Integration: Trapezoidal rule, Simpson's 1/3rd rule, Simpson's 3/8th rule.	6		5

Text/Reference Books:

- (1) Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
- (2) Ramana B.V., Higher Engineering Mathematics, Tata Mc-Graw Hill, New Delhi, 11th Reprint, 2010.
- (3) N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
- (4) B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
- (5) P. N. Wartikar and J. N. Wartikar, Applied Mathematics, Volume I and II.
- (6) H.K. Dass, Rama Verma, Rajnish Verma, V.J. Dagwal, Sajid Anwar and D.F. Shastri, Engineering Mathematics, Volume II, S. Chand.

09/07/2026
Dr. D.R. Shastri

09/07/2026
Dr. D.R. Shastri

09/07/2026
Mrs. M.S. Palast

Dr. R.V. Harane

**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA, UMRER
ROAD, NAGPUR**
An Autonomous Institute Affiliated to RTMNU, Nagpur
Faculty of Science & Technology
B.Tech. Mechanical Engineering (NEP) (CBCS)

Sem-II	Total Hours Distribution Per Week		
Total Credits : 1	Practical (P) : 2 Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2ME01P	Applied Mathematics-II Lab	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
25 Marks	25 Marks	25 Marks	3 Hours

Practical Course Objectives

Solving problems using Open-Source Software Programming Language

Practical Course Outcomes

After completing the practical course, students will be able to solve the following using Open-Source Software Programming Language.

- 1 Problems on the Algebraic and Transcendental Equations.
- 2 Problems on the simultaneous linear equations.
- 3 Problems by using the different methods to solve Ordinary differential equations.
- 4 Problems to find the Laplace transform of various functions.
- 5 Problems on Finite Differences, Numerical differentiation and numerical integration.

Sr. No.	List of the Practical: Performance of at least SIX practical is compulsory in a semester.
Unit-1: Solution of Algebraic and Transcendental Equations (6 Hours)	
1	Write a Program to solve Algebraic and Transcendental Equations by one of the iterative methods: Bisection method, and Method of False position.
2	Write a Program to solve Algebraic and Transcendental Equations by one of the iterative methods: Newton Raphson method, Newton Raphson method for multiple roots and Direct iteration method.
Unit 2: Solution of system of simultaneous linear equations: (04 Hours)	
3	Write a Program to solve the system of simultaneous linear equations by one of the iterative methods: Gauss Jordan method, and Gauss seidel method.
4	Write a Program to solve the system of simultaneous linear equations by one of the direct methods: Gauss elimination method, and Crout's method
5	Write a Program to find the Largest Eigen value and its corresponding Eigen vector of a matrix by iteration method.
Unit 3: Numerical solution of Ordinary differential equations: (04 Hours)	
6	Write a Program to solve ordinary differential equations numerically by the iterative method: Euler's modified method.
7	Write a Program to solve ordinary differential equations numerically by the iterative method: Runge Kutta method of 4 th order.
8	Write a Program to solve ordinary differential equations numerically by the iterative method: Milne's Predictor-Corrector method.

(Dr. Yashraj Chavhan)
09/07/2026

(Dr. S. K. S. Kulkarni)
09/07/2026
Dr. D. R. Shastri
09/07/2026

(Dr. R. V. Hanare)

(Dr. M. S. Patil) Contd.

Unit-4 Laplace Transform & Fourier Transform

9	Write a Program to find the Laplace transform and Inverse Laplace transform of different functions.
10	Write a Program to find the Fourier transform of different functions.

Unit-5: Finite Differences, Numerical Differentiation and Integration

11	Write a Program to solve the problems on Unequal interval. Also Numerical Differentiation by one of the formulas: Forward, Backward and Central difference formula
12	Write a Program to solve the problem of Numerical Integration by one of the formulas: Trapezoidal rule, Simpson's 1/3rd rule, Simpson's 3/8th rule.

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09/07/2026
(Dr. Yusuf Ali)

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09/07/2026
(Dr. S. K. Sharma)
Dr. D. F. Shastri
09/07/2026

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Mrs. M. S. Patel

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Dr. R. V. Harane

**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA, UMRER
ROAD, NAGPUR**

An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

**B.Tech. Mechanical Engineering/Electrical Engineering/ Electronics & Telecommunication
Engineering (NEP) (CBCS)**

Sem-II	Total Hours Distribution Per Week		
Total Credits : 3	Lecture (L) : 3 Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2ME02T/BT2EE02T/BT2ET02T	Applied/Engineering Chemistry	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
40 Marks	60 Marks	50 Mark	3 Hours

Course Objectives

1	To provide fundamental knowledge of electrochemistry necessary to understand the function of batteries and understanding of the rare earth metals
2	To make students learn about the environment and ensuring sustainable development.
3	To develop analytical problem-solving and laboratory skills for applying chemical concepts.

Course Outcomes

After completion of syllabus, students would be able to

1	Students will inculcate the use of instrumentation techniques and interpret its applications in material characterization.
2	Know about fuels and lubricants and analyze the situation for their appropriate applications
3	Analyze the various industrial problems arising due to water quality and their remediation.
4	Develop the environmental awareness from the basics of green chemistry and its application
5	Students will able to solve problems regarding rare earth elements, the correct disposal methods of e-wastes and while creating any tool they will keep this environmental aspect in mind.

*Dr. Aravind
09/07/2026*

*Dr. S. K. Sharma
09/07/2026*
*Dr. D. P. Shastri
09/07/2026*

*Dr. D. P. (Hons)
09/07/26*
Mr. M. S. Patil

*P. A. Patle
09/07/26*

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SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1: Fundamentals of Spectroscopy and instrumentation			
UV-visible Spectroscopy (Beer-Lambert's law and its numerical), (IR) Infrared spectroscopy and (NMR) Nuclear Magnetic Resonance spectroscopy, (XRD) X-ray Diffraction Analysis, Gas Chromatography.	7		1
Unit-2: Fuels & Lubricants			
A] Fuels: Introduction: HCV & LCV, numerical based on calorific value determination by Bomb and Boy's calorimeter; Liquid fuels – fractional distillation of crude petroleum. B] Lubricants: Mechanism of lubrication, types of lubricants and its properties (viscosity & viscosity index, flash & fire point, aniline point).	8		2
Unit 3: Water Chemistry			
Introduction, potable water quality parameter, types of hardness sterilization desalination of water by RO softening of water by zeolite process and ion exchange, demineralization of water, numerical based on Zeolite process, boiler trouble –Scale and sludge.	7		3
Unit- 4: Electrochemical Power system			
Battery: Introduction, characteristic and general application, H ₂ -O ₂ fuel cells, Lithium ion battery. Super capacitors: Definition, types, characteristics and application. amorphous Si and quantum dye sensitized solar cells. Corrosion: Definition cause & Theories of Corrosion (Dry, Wet and Differential Aeration), Pilling-Bedworth Rule & Numerical, Types of Corrosion (Intergranular & Stress), Corrosion Protection methods.	7		4
Unit 5:Sustainable material and E-waste			
Introduction, source, composition characteristic and need of E waste management, E- waste environmental and health risks, Extraction of rare earth and precious metals from e-wastes, Twelve principles of Green Chemistry. Green Computing, Role of Green Computing in Environment and Research, Green devices and Green data Servers.	7		5

(Dr. A. Vaidya)
09/07/26

(Dr. D. P. Shastri)
09/07/2026

(Dr. S. K. Saha)
09/10/2026

(Mr. M. S. Paul)
12/07/26

(Mr. D. P. Chaudhary)
09/10/26

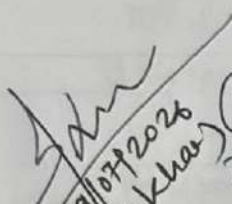
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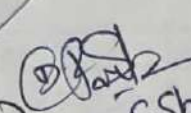
(P. A. Patil)
09/10/26

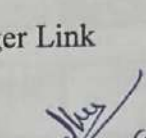
Text/Reference Books:

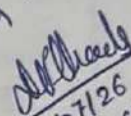
1. M Afshar Alam, Sapna Jain, HenaParveen, Green Computing Approach Towards Sustainable Development, Wiley Interscience Publications.
2. S. S. Dara, A Textbook of Engineering Chemistry, S. Chand Publications
3. ShikhaAgrawal, Engineering Chemistry: Fundamentals and Applications, Cambridge University Press.
4. Supercapacitors and Their Applications Fundamentals, Current Trends, and Future Perspectives, Edited By Anjali Paravannoor, Baiju K.V, CRC Press
5. The Rare Earth Elements: An Introduction, JHL Voncken, Springer Link


09/10/2026
(Dr. A. Vaidya)


09/10/2026
(Dr. S. Khar)


Dr. D. F. Shastri
09/10/2026


Mrs. M. S. Palani


09/10/2026
(M. D. P. Chaitanya)


09/10/2026
P. A. Patle

**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA, UMRER
ROAD, NAGPUR**

An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

**B.Tech. Mechanical Engineering/Electrical Engineering/ Electronics & Telecommunication
Engineering (NEP) (CBCS)**

Sem-II	Total Hours Distribution Per Week		
Total Credits : 1	Lecture (L) : 0 Hrs	Practical/Activity (P/A) : 2 Hr	
Subject Code	BT2ME02P/BT2EE02P/BT2ET02P	Applied/Engineering Chemistry Lab	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
25 Marks	25 Marks	25	3 Hours

Practical Course Objectives

1	Analyze experimental data, interpret results and draw scientifically valid conclusion.
2	Use modern laboratory techniques analytical tools for the characterization of chemical system and materials.

Practical Course Outcomes

After completion the Practical course, students would be able to

1	Estimate the concentration soluble impurities present in the given water sample.
2	Operate laboratory instrument safely and accurately to evaluate fuel and lubricant.
3	Perform quantitative chemical analysis using standard laboratory Procedure with accuracy.

List of Practical (Any 6 performance based and 1 virtual lab experiment)

Sr. no.	
1	Proximate Analysis of coal.
2	Estimation of viscosity of oil by Redwood Viscometer 1 or 2.
3	Estimation of Flash point of lubricating oil by open/ closed cup apparatus.
4	Estimation of Hardness of water (Total, Permanent & Temporary) by complexometry.
5	Estimation of Alkalinity of water (Warder's Method).
6	Estimate the amount of dissolved oxygen present in water sample.
7	Estimation of Ni by complexometry.
8	Fe (II)/ (III) estimation by redox titration.
9	Virtual Lab: Experiment on Calorimetry.
10	Virtual Lab: Beer's Law verification by spectrophotometer.

(Signature)
09/07/26
(A. S. Kulkarni)

(Signature)
09/07/2026
D. P. Shandekar
09/07/2026
(A. S. Kulkarni)

(Signature)
09/07/26
P. A. Patil

(Signature)
Ms. M. S. Patil

(Signature)
09/07/26
(Ms. D. P. Chaudhary)

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING NAGPUR
AN AUTONOMOUS INSTITUTE
AFFILIATED TO RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR
FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. MECHANICAL ENGINEERING

Course Category	ESC-IV		
Sem: II	Total Hours Distribution per week		
Total Credit: 3	Lecture (L): 3 Hrs	Tutorial/Activity(T/A): 0 Hr.	
Subject Code	BT2ME03T (Th)	ENGINEERING MECHANICS	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Minimum Passing Marks	Examination Duration
40	60	-	3 Hours

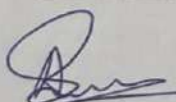
Course Objectives

1	To Understand the force systems and draw free body diagram to analyze rigid body equilibrium.
2	To Comprehend the principles of friction and solve engineering mechanics problems associated with frictional force.
3	To introduce the concept of centriod and moment of inertia of plane area.
4	To make student aware about the method of joint and method of section to analyse the truss.
5	To Understand the concept of motion of particles and rigid bodies.

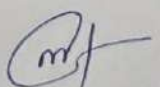
Course Outcomes

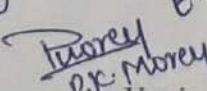
After successful completion of this course the student will be able to:

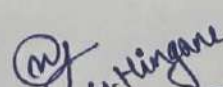
CO1	Analyse a given force system and apply the knowledge of force system and moment to determine resultant of various force system & apply the knowledge of equilibrium of force system.
CO2	To apply the basics of friction
CO3	Locate Centroid and compute area Moment of Inertia for standard shapes and composites areas.
CO4	Analyze simple determinate trusses
CO5	Analyze the connected system of particles using concept of dynamic equilibrium

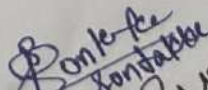

Dr. A.S. Moon
 Chairman BOS

BOS:-CIVILB-TECH


Dr. S.M. Gajbhiye


Er. P.K. Morey
 Version:-1


Er. M.G. Hingane
D.L. Budhlani


Er. B. B. Khatke
S.V. Pathare
 Session-2026-27

SYLLABUS

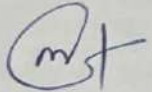
Contents	No. of hours
UNIT 1: Basics Concepts and equilibrium of force systems Introduction to Engineering Mechanics: Force Systems, Basic concepts, Rigid Body equilibrium; System of Forces, Coplanar Concurrent Forces, Resultant Moment of Forces and its Applications. Equilibrium of System of Forces, Free body diagrams, Equilibrium of Coplanar Systems. Simple beams and support reactions. Diagram of Statically Determinate Beams.	7
UNIT 2: Friction Types of friction, Limiting friction, Laws of Friction, Static Friction; Motion of Bodies, wedge friction.	5
UNIT 3: Centroid and Moment of Inertia Centroid and Centre of Gravity, Centroid of standard shapes and application to composite plane shapes; Area moment of inertia: formula of area moment of inertia of standard shapes, parallel and perpendicular axis theorem, application to composite plane shapes	7
UNIT 4: Analysis of structures- Trusses Assumption and Analysis of simple trusses by method of joints & method of sections	5
UNIT 5: Kinetics of Particles Kinetics of particles D'Alemberts principle and its application in connected system of particles, Impulse Momentum, Collision of bodies.	5

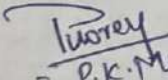
References

Text Books Recommended:

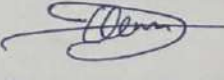
1. Vector Mechanics for Engineers: Statics and Dynamics, Johnston. R.E., Beer. F., Eisenberg. E. R., & Mazurek. D., McGraw Hill
2. Engineering Mechanics: Principles of Statics and Dynamics, R. C. Hibbler, Pearson Press
3. Engineering Mechanics, S S Bhavikatti, Newage International publication

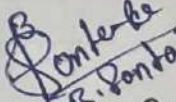

 Dr. A. S. Moon
 Chairman BOS


 Dr. S. M. Gajbhiye


 Er. P. K. Morey


 Er. M. Hingane


 D. L. Budhlani


 Er. B. Sontakke
 S.V. Patil

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING NAGPUR**AN AUTONOMOUS INSTITUTE****AFFILIATED TO RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR****FACULTY OF SCIENCE & TECHNOLOGY****B.TECH. MECHANICAL ENGINEERING**

Course Category	ESC-IV		
Sem:II	Total Hours Distribution per week		
Total Credit: 1	Practical(P): 2 Hrs	Tutorial/Activity(T/A): 0 Hr.	
Subject Code	BT2ME03P (Practical)	Engineering Mechanics Lab	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Minimum Passing Marks	Examination Duration
25	25	25	1 Hours

Course Outcomes

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

CO1	Analyse a given force system and apply the knowledge of force system and moment to determine resultant of various force system & apply the knowledge of equilibrium of force system.
CO2	To apply the basics of friction
CO3	Locate Centroid and compute area Moment of Inertia for standard shapes and composites areas.
CO4	Analyze simple determinate trusses
CO5	Analyze the connected system of particles using concept of dynamic equilibrium

Minimum Eight out of the following practical's shall be performed:

Sr. No.	List of Practical's
01	To verify law of polygon of forces using Law of Polygon Apparatus
02	To determine the forces in the members of a Jib Crane Apparatus experimentally and graphically
03	Parallel Forces Apparatus
04	Law Of Moment
05	Rolling Friction Apparatus
06	Equilibrium Forces Apparatus
07	To find determine the support reactions of a Simply Supported Beam experimentally and analytically
08	To determine the coefficient of friction between two surfaces of different material on Plane Friction Apparatus.
09	To find the forces in the member of truss using graphical method and hand calculation.
10	To find (1) Principle moment of inertia and (2) Moment of inertia and product of inertia

Dr. A.S. Maan
Chairman BOS

Dr. S.M. Gaybiye

Version: 1.0

Er. M. G. Ingane

D.L. Budhkar

Er. P.K. Jadhav

Er. B. B. Jadhav

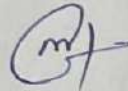
S.V. Patil

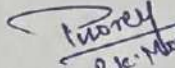
	about any inclined axis for a composite figure using Mohr's circle and hand calculation.,
11	To determine the coefficient of friction of Coil Friction Apparatus.
12	Kinetics of particles (collision of bodies)
13	To find support reactions of a simply supported beam using graphical method and hand calculation.

Note:

6. Conduct minimum 08 practical's out of above list and practical no. 1 is mandatory.
7. Viva-voce question should be included in each of the practical.
8. During Continuous Internal Evaluation (CIE) practical Marks, regular performance of practical's for 10 marks, 05 Marks for Journal submission and 10 Marks for internal viva-voce examination.
9. During End Semester Exam (ESE) practical Marks, external practical examination performance must be conducted for 15 marks and 10 Marks for viva.
10. For Eligibility of ESE Practical examination, internal submission of Journal (Practical File) is mandatory.

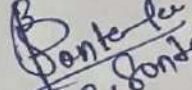

Dr. A.S. Moon
Chairman BOS


Dr. S.M. Gajbhiye


Er. P.K. Morey


Er. M.G. Hingane


D.L. Budhlani


Er. B. Sondakhe

S.V. Patil

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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. MECHANICAL ENGINEERING

Course Category	Engineering Science Course -V(ESC-V)		
Sem: II	Total Hours Distribution per week		
Total Credit: 02	Lecture (L): 02 Hrs.	Tutorial/Activity(T/A): ----	
Subject Code	BT2ME04T Theory	Problem Solving with Python	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE) Marks	Minimum Passing Marks	Examination Duration
20	30	25	2 Hours
Course Objectives			

Course Objectives

1	Understand the fundamentals of Python programming, including variables, data types, operators, and expressions.
2	Apply control structures such as conditional statements and loops to solve computational problems.
3	Manipulate data using strings, lists, tuples, dictionaries, and sets.

Course Outcomes

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

CO1	Understand the fundamentals of Python programming, including installation, IDE usage, Python syntax, variables, data types, and input/output operations. Mapped with Unit-1
CO2	Apply Python data structures such as lists, tuples, sets, dictionaries, and strings for efficient data storage, manipulation, and processing. Mapped with Unit-2
CO3	Develop Python programs using decision-making statements, looping constructs, and loop control statements to solve computational problems. Mapped with Unit-3
CO4	Design modular Python programs using functions, function calling techniques, and different types of function arguments such as positional, keyword, default, and variable-length arguments. Mapped with Unit-4

SYLLABUS

Contents	No. of hours
Unit I:-Introduction to Python: Installing Python and IDE :(IDLE / VSCode / PyCharm),Features of Python,Python syntax and indentation ,Variables and data types: • Integer • Float • String • Boolean Input and output statements	6
Unit II: -Conditional statements: • if • if-else • if-elif-else Looping statements: • for loop • while loop Loop control: • break • continue • Pass	6
Unit III:-Introduction to Data Types : Lists • Creating Lists • Indexing in Lists • Slicing in Lists • List Methods Tuples • Introduction to Tuples • Creating Tuples Sets • Introduction to Sets • Creating Sets Dictionaries • Introduction to Dictionaries • Creating Dictionaries • Accessing Dictionary Elements String Operations and Methods • Introduction to Strings • String Indexing • String Slicing • String Operations	6
Unit IV:-Introduction to Functions • Definition and purpose of functions • Advantages of using functions • Types of functions in Python • Built-in functions and user-defined functions Defining and Calling Functions • Creating a function using def keyword • Function syntax • Calling a function Function Parameters and Argument ○ Positional arguments ○ Keyword arguments ○ Default arguments ○ Variable-length arguments (*args, **kwargs)	6

Sr. No.	Assignment Guidelines
1	Understand Python installation, syntax, variables, data types, operators, and basic input/output.
2	Apply Python data structures and perform various operations on strings, lists, tuples, and dictionaries.
3	Design reusable programs using functions and solve problems using recursion.
4	Design simple object-oriented programs using classes, objects, constructors, and methods.

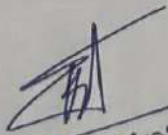
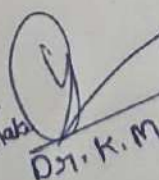
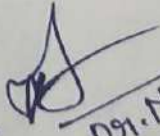
References

Text Books Recommended:

1. **Reema Thareja**, Python Programming: Using Problem Solving Approach, Oxford University Press.
2. **R. Nageswara Rao**, Core Python Programming, Dreamtech Press.
3. **Allen B. Downey**, Think Python: How to Think Like a Computer Scientist, 2nd Edition, O'Reilly Media.
4. **Yashavant Kanetkar**, Let Us Python, BPB Publications.

Reference Books Recommended:

1. **Eric Matthes**, Python Crash Course, 3rd Edition, No Starch Press.
2. **Mark Lutz**, Learning Python, 5th Edition, O'Reilly Media.
3. **Al Sweigart**, Automate the Boring Stuff with Python, 2nd Edition, No Starch Press.

 P.B. Jaipurkar
 Dr. A.N. Thakur
 Dr. K. Malpe
 Dr. N.T. Gole

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING NAGPUR

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FACULTY OF SCIENCE & TECHNOLOGY B.TECH. MECHANICAL ENGINEERING

Course Category	Program Core Course -I (PCC-I)			
Sem:II	Total Hours Distribution per week			
Total Credit: 02	Lecture (L): 02Hrs.	Tutorial/Activity(T/A): -----Hr.		
Course Code	BT2ME05T	Course :-Basics of Mechanical Engineering		
	Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Total Marks	Minimum Passing Marks	Examination Duration
20	30	50	25	----Hours

Course Objectives

1	To introduce fundamentals of structures, stress-strain analysis, materials, and manufacturing processes.
2	To develop understanding of thermodynamics, heat transfer, refrigeration, and energy conversion.
3	To explain principles of machines, mechanisms, and modern advances in mechanical engineering.
4	To familiarize learners with IC engines, automobile engineering, and electric vehicle technology.
5	To build foundation in fluid mechanics, hydraulic machines, measurement, and energy sources.

Course Outcomes

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

CO1	Introduction on structure analysis, stress-strain concepts, and engineering materials.
CO2	Basics in thermodynamics, heat transfer, refrigeration, and power plants.
CO3	Explain IC engines, automobile systems, and fundamentals of electric vehicles
CO4	Explain mechanisms, machine elements, automation, mechatronics, and robotics and electric vehicle.
CO5	Interpret measurement techniques, fluid mechanics principles, hydraulic machines, and energy sources.

S. S. Pawar
24/7/26
SRPCE.MECHANICAL ENGG.

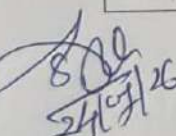
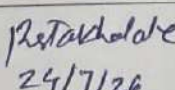
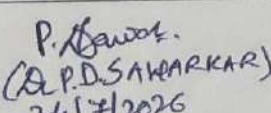
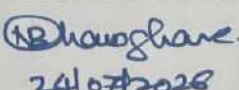
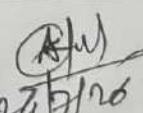
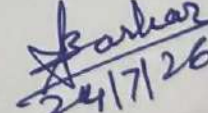
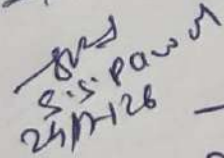
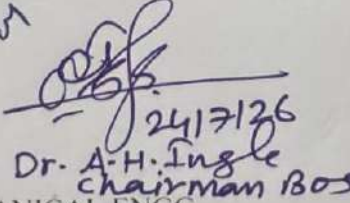
Dr. A. H. Ingle
24/7/26
Chairman.

Version:1

PRINCIPAL
SMT RADHIKATAI PANDAV COLLEGE
OF ENGINEERING
BAHADURA (NAGPUR)
Effective from Session :2026-27

SYLLABUS

Contents	No. of hours
Unit I – Materials, Manufacturing and Structure analysis • Engineering Materials – Introduction, Ferrous and non ferrous metal, alloys and their composites structures, smart materials and their basic properties. • Manufacturing Processes – Introduction on Casting, Forming, sheet metal working, Joining, machining, CNC and 3D printing. • Structure Analysis – Basics of beams, loads, supports, shear force and bending moment diagrams. • Stress and Strain Analysis – Normal and shear stress, types of strain, elastic constants, stress-strain curve.	8
Unit II – Fluids, Measurement and Energy Sources • Fluid Mechanics and Machines – Properties of fluids, Pascal's law, Bernoulli's theorem, Centrifugal and reciprocating pumps, Introduction on Pelton and Francis turbine. • Measurement and Metrology – Standards of measurement, linear measurement instruments. Accuracy, precision, limits, fits, tolerances, quality control and inspection. • Energy Sources – Conventional sources (coal, hydro, nuclear) and unconventional sources (solar, wind, geothermal, tidal).	7
Unit III – Thermal and Energy Conversion (Sciences) • Thermodynamics – Laws of thermodynamics, basic processes, Otto, Diesel and Carnot cycles. • Heat Transfer – Conduction, convection, radiation, simple heat exchangers. • Refrigeration and Air Conditioning – Vapour compression and refrigeration cycle, psychrometry chart. • Energy Conversion, IC Engines and Power Plants – Air Compressor: Introduction, Uses of Compressed air, Basics on reciprocating compressor and centrifugal compressor. Introduction to hydro and nuclear power plants. • IC Engines: Components of IC engines, Basics of two-stroke Four stroke and Petrol/Diesel engines. • Automobile Engineering – Basics in Vehicle layout, suspension, braking systems.	8
Unit IV – Machines and Modern Advances • Advances in Mechanical Engineering – Basics of automation (AIP), mechatronics systems, Artificial Intelligence and Machine Learning. Fundamentals of electric vehicles. • Introduction to Robotics: General in Robot anatomy, joints and links and common robot configurations. • Theory of Machines – Introduction on Kinematics and dynamics of machines, inversions of four-bar chain and slider-crank. • Machine Elements and mechanical drives- Components: Shafts, axles, clutches, brakes, bearings, springs, pressure vessels and. Introduction to Power Transmission devices- Belt, Rope, Chain and Gear drive	7
TOTAL----- 30 HOURS	

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Dr. A. H. Ingle
Chairman BOS
SRPCE, MECHANICAL ENGG.

PRINCIPAL
SMT RADHIKATAI PANDAV COLLEGE
OF ENGINEERING
BAHADURA (NAGPUR)
 Version: I Effective from Session :2026-27

Sr. No.	Assignment Guidelines
1	Assignment must be completed and submitted individually.
2	Assignments must be neat, legible, and well-structured Format Compliance.
3	Content must be organized, properly formatted, and easy to understand.
4	All assignments must be submitted on or before the due date.

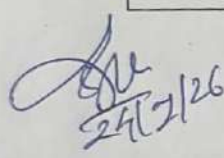
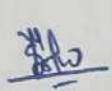
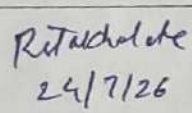
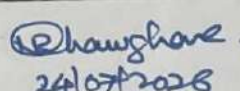
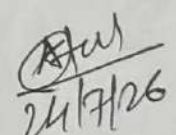
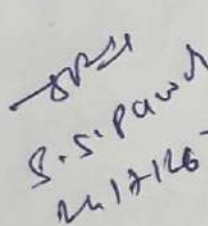
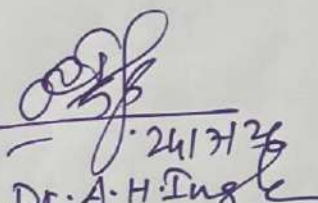
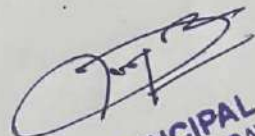
References

Text Books Recommended:

1. R.K. Rajput , Engineering Materials . 3rd Edition. S. Chand Publishing, New Delhi, 2016.
2. P.N. Rao , Manufacturing Processes . 5th Edition. Tata McGraw Hill Education, New Delhi, 2013.
3. R.K. Bansal , Strength of Materials. 4th Edition. Laxmi Publications, New Delhi, 2014.
4. R.K. Bansal , Fluid Mechanics and Hydraulic Machines —. 9th Edition. Laxmi Publications, New Delhi, 2015.
5. R.K. Rajput , Thermal Engineering . 10th Edition. Laxmi Publications, New Delhi, 2017.

Reference Books Recommended:

1. A.K. Jha , Metrology and Measurement . 2nd Edition. Khanna Publishers, New Delhi, 2012.
2. P.K. Nag ,Energy Sources and Power Plant Engineering . 2nd Edition. Tata McGraw Hill Education, New Delhi, 2014.
3. J.P. Holman ,Heat and Mass Transfer . 10th Edition. McGraw Hill Education, New York, 2010.
4. S.S. Rattan ,Theory of Machines . 4th Edition. Tata McGraw Hill Education, New Delhi, 2014.
5. Kirpal Singh , Automobile Engineering . Vol. I & II. Standard Publishers, New Delhi, 2011

 24/7/26

 24/7/26 (A.P.D. SAWARKAR) 24/7/2026
 24/07/2026
 24/7/26
 24/7/26
 24/7/26
 Dr. A. H. Ingole
 Chairman BOS

PRINCIPAL
 SMT RADHIKATAI PANDAV COLLEGE
 OF ENGINEERING
 BAHADURA (NAGPUR)

**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA, UMRED
ROAD, NAGPUR**

An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

**B. Tech. Mechanical Engineering/Civil Engineering/Electrical Engineering/
Electronics & Telecommunication/Computer Sci. Engineering/Computer Engineering
(NEP) (CBCS)**

Sem-II	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L): 2Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2ME06T/BT2CV06T/BT2EE06T /BT2ET07T/BT2CS06T/BT2CE06T	REFER TO IKS (Preserving Art, Culture and Traditions)	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
20 Marks	30 Marks	25 Marks	2 Hours

Course Objectives	
1	To recognize the perspective of Indian Knowledge System v(IKS) for national pride.
2	Sensitize the students to the contributions made by Indians in the field of philosophy, art and health.

Course Outcomes	
After completion of syllabus, students would be able	
1	Interpret basics of Indian Knowledge system.
2	Integrate the teaching of Indian culture and civilization.
3	Appreciate Indian artistic tradition.
4	Analyze Indian health and wellness system for healthy living.

DR. AMOL MUSALE

Dr. D. R. Shinde
09/07/2026

Supriya May
09/07/2026

Mrs. M. S. Palekar

SYLLABUS.(REFER TO IKS)

DETAILS OF TOPIC	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1			
Introduction to Indian Knowledge System: Introduction and overview of Indian Knowledge System , Vedic Corpus-Vedas, Types of Vedas, Upvedas, Types of Upvedas.	6		1
Unit-2			
Indian Culture and Civilization: Indian Culture and Civilization, Its characteristics, Difference between Culture and Civilization, Indus Valley Civilization, Vedic Civilization.	6		2
Unit-3			
Indian Artistic Traditions: Indian Artistic Traditions, Chitrakala- Indian Style Painting (Madhubani, Warli, Phad, Kalamkari, Gond, Mandana), Nritya: Indian Dance Forms(Bharat natyam , Kathak, Kathakali, Kuchipudi, Manipuri, Mohiniattam). Sangeet: Carnatic Music & Hindustani Music.	6		3
Unit-4			
Health And Wellness: Wellbeing, Mental And Physical, Dimensions of Wellness, Concept of Healthy Living In Ayurveda, Tri-Doshas-Relationship To Health.	6		4

Text/Reference Books: -

- 1) Indian Knowledge Systems Ancient Wisdom For The Modern World, Dr. Madhukar Nikam, DATTSONS.
- 2) Indian Knowledge Systems Concepts And Applications. B. Mahadevan, Vinayak Rajat Bhat, Nagendra Pavana R.N.PHI Learning Private Limited.
- 3) Indian Knowledge Systems. Dr. Vilas Gajbe. Dr. Sanjiv Khondekar. Dr. Vinay Upadhyay. Dr. Prashant Raut. Nutan Akash Publication.

DR. ANUR MUSALE

Dr. D.F. Shastri
09/07/2026

Supriya Aen
09/07/2026

Ms. M. S. Palani

**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA, UMRED
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Faculty of Science & Technology

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(NEP) (CBCS)**

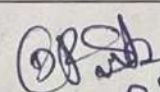
Sem-II	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L): 2Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2ME06T/BT2CV06T/BT2EE06T /BT2ET07T/BT2CS06T/BT2CE06T	REFER TO IKS (Consciousness Studies)	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
20 Marks	30 Marks	25	2 Hours

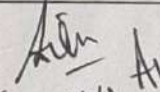
Course Objectives	
1	To recognize the perspectives of Consciousness Studies

Course Outcomes	
After completion of syllabus, students would be able	
1	To define the primary fundamentals of Consciousness Studies.
2	To explain the pros and cons of the effects of Consciousness Studies.
3	To classify the consequences of Consciousness studies to promote behavioural science.
4	To relate the basics of Consciousness Studies to better understanding the problems of individual and society.


DR ANMOL MUSACE
 09/07/2026
 (Dr. Skhan)

maulay
 Mrs. M.S. Patel
 09/07/2026


 Dr. D.P. Shetye
 09/07/2026


 (Supriya Aher)
 09/07/2026

SYLLABUS (REFER TO IKS)

DETAILS OF TOPIC	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1			
Introduction to Psychology: An introduction to Psychology, Definition of Psychology, History of Psychology, Psychological methods, Sub-divisions of Psychology, Application of Psychology.	6		1
Unit-2			
Basic Cognitive Processes Sensory Process-general characteristics of senses, visual sense, auditory sense, other senses, Perpetual organization-principles of Perceptual organization, object perception and perceptual, object perception and perceptual constancies, influences upon perception, extra sensory perception.	6		2
Unit-3			
Classical conditioning, theories about classical conditioning, Reinforcement and Punishment.	6		3
Unit-4			
Theories about memory, brain and memory, long term memory, forgetting.	6		4

Text/Reference Books: -

1. Clifford T Morgan, King, Weiss and Schopler, Introduction to Psychology, McGraw Hill Education (India) Private Limited.
2. Hilliard Atkinson and Atkinson, (1977) Introduction to Psychology, Tatty McGraw Hill.
3. Kao H.S.R. & Sin had. (Ends) (1977) Asian Perspectives on Psychology

Handwritten signatures and dates:
 1. *Dr. A. M. S. Paley*
 2. *Dr. D. F. Sharma* 09/07/2026
 3. *Supriyo K* 09/07/2026
 4. *Dr. S. Kumar* 09/07/2026
 5. *DR. AMOL MUSALE*

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA, UMRED ROAD,
NAGPUR

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Faculty of Science & Technology

B. Tech. Mechanical Engineering/Civil Engineering/Electrical Engineering/
Electronics & Telecommunication/Computer Sci. Engineering/Computer Engineering
(NEP) (CBCS)

Sem-II	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L): 2Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2ME06T/BT2CV06T/BT2EE06T /BT2ET07T/BT2CS06T/BT2CE06T	REFER TO IKS (Glimpse of Ancient Science & Technology)	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
20 Marks	30Marks	25 Marks	2 Hours

Course Objectives	
1	To recognize the Glimpse of Ancient Science & Technology

Course Outcomes	
After completion of syllabus, students would be able	
1	To understand about great mathematicians and to help students to trace, indentify, practice, and develop the significant Indian mathematics
2	To understand the concept of motion and its application in Indian ancient physics literature.
3	To understand the concept of basic chemicals & metallurgical process of ancient and medieval India.

SR Anur Murti

Ms. M. S. Patel

Dr. D. F. Shastri

09/07/2026

Dr. S. K. Khair

09/07/2026

Dr. D. F. Shastri

09/07/2026

Dr. A. B. Shastri

09/07/2026

Dr. A. B. Shastri

09/07/2026

SYLLABUS (REFER TO IKS)

DETAILS OF TOPIC	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1			
Mathematics in India: Introduction of inception of Mathematics from Vedic periods. Great mathematician and their contribution (e.g. Aryabhatta, Bhaskara, Bhramagupta, Ramanujan, Pingala, Bhaskara-II, Sulabhasutras (Pythagoras theorem), Square, Square root of imperfect squares, Value of Pi.	6		1
Unit-2			
India: Vaisheshikadarshan Atomic Theory & law of motion, Theory of Panchamahabhoota, BrihatShathaka (division of time, unit of distance), Bhaskaracharya (Introduction to theory of gravity, Suryasidhanta & Sidhantasjhiromani), Lilavati (Gurutvakarshan shakti)	6		2
Unit-3			
Chemistry of India: Vatsyayana, Nagarjuna, Vagbhata – building of Theras-Shala (laboratory), working arrangements of Ras-Shala, material and equipment, YashoDharaBhatta-process of distillation, apparatus. Metallurgy in India, Suvarna(gold) and its different types of properties, Rajata (Silver), Tamra (Copper) , Loha (Iron), Jasta (Zinc) Naga/Sisa (lead), Pittala (brass)	6		3
Unit- 4			
Medicines and yog in India : Importance and benefits of yoga purpose of yoga traditional knowledge of medicinal plant, use of home available herbs and spices.	6		4

Text/Reference Books: -

1. R. P Kularani, Glimpse of Indian Engineering and Technology (Ancient & Medieval period, Munshiram Manoharlal Publishers Pvt. Ltd, 2018
2. A.K. Pathak, Science and Technology in India, Anshikapraakashnpratapgarh ,2016.
3. PB Sharma, S Narnia, Doctors Scientists and Engineers of Ancient India, Kalpaz Publications 2017.
4. NVP, Unithiri.Indian Scientific Traditions(Professor K.N. NeelkantanElayath Felicitation Volume), publicatio9n division, University of Calicut,2006.
5. Anonymous, History of Science in India-Volume-I, Part-I(Physics, Mathematics & Statistics), the national academy of science, India & the Ramakrishna Mission Institute of culture, 2014.
6. Kaptur K and Singh A.K.(Eds 2005), Indian Knowledge Systems, Vol-1, Indian Institute of Advanced Study, Shimla. Tatvabodh of Snakaracharya, Central Chimney Mission Trust, Bombay, 1995.
7. Dharmpal, Indian Science & Technology in the 18th century, Rashtrottahanasahitya, 1983.
8. S Biswal, B L Ray, Vedic Science and Technology, DK Porint world, 2009.

DR. AMR MUSACE

Mus. M. S. Palani
09/07/2026

Dr. D. R. Shankar
09/07/2026

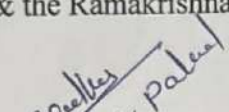
Supriyo Aich
09/07/2026

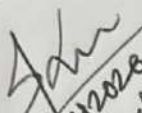
Dr. Monami Aich
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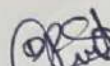
9. A. K. Bag, History of technology in India, (Set 3 vol), Indian Nation Science Academy, 1997.
10. A Gosh, History of Science in India (Volume-I Part-II Astronomy), the national academy of science, India & the Ramakrishna mission institute of culture, 2014.



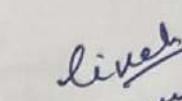
DR. ANMOL MUSACE


Mrs. M. S. Patel


09/07/2026
(Dr. S. K. Sharma)


Dr. D. R. Shastri
09/07/2026


(Supriya)
09/07/2026


(Dr. Monmurti)
09/07/2026

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Faculty of Science & Technology

**B. Tech. Mechanical Engineering/Civil Engineering/Electrical Engineering/
Electronics & Telecommunication/Computer Sci. Engineering/Computer Engineering
(NEP) (CBCS)**

Sem-II	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L): 2Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2ME06T/BT2CV06T/BT2EE06T /BT2ET07T/BT2CS06T/BT2CE06T	REFER TO IKS (Wellness, traditional medicines & yoga)	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
20 Marks	30 Marks	25 Marks	2 Hours

Course Objectives	
1	To recognize the perspective

Course Outcomes	
After completion of syllabus, students would be able	
1	To define the primary fundamentals Wellness, Traditional Medicines & Yoga.
2	To relate the overall elements of nature around human life & livelihood.
3	To classify and rectify the problems related to body .
4	To explain benefits of wellness.

*DR. ANNA
MUSACE*

*Dr. D. F. Shastri
09/07/2026
(Dr. S. K. Kulkarni)*

*Supriya
(SUPRIYA)
09/07/2026*

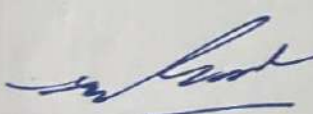
Ms. M. S. Palani

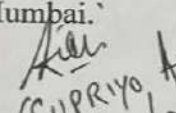
SYLLABUS (REFER TO IKS)

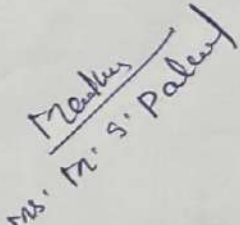
DETAILS OF TOPIC	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1			
Importance of health and wellness, Essential components of balance diet for healthy living, Processed foods and unhealthy eating habits.	6		1
Unit-2			
Body systems and common disease, Sedentary lifestyle and its risk of disease, Stress, Anxiety and depression, Factors affecting mental health.	6		2
Unit-3			
Importance and benefits of Yoga, Purpose of Yoga, traditional knowledge of medicinal plant, use of home available herbs and spices.	6		3
Unit-4			
Vedas and its types, Social change in Indian society, Social stratification and class conflicts.	6		4

Text/Reference Books:

1. Sociology in India- Surendra Sharma, Rawat Publication.
2. Bradford B, Strand and Others, Fitness Education Arizona GorsuchSeani; sbrick Publishers, 1997.
3. Scott K Powers and Stephen L Dodd. Total Fitness; Exercise; Nutrition and wellness Boston: Ally and Bacon, 1999.
4. RigvedaSamhita with SayanaBhashya, VaidikSamshodhanMandal, Pune.
5. Riksuktashati, H. D. Velankar, BharatiyaVidyaBahavan, Mumbai.


 DR. D. F. SHANDEKAR
 09/07/2026
 (S. K. Khar)


 SUPRIYO
 09/07/2026
 (HEH)


 MS. M. S. PALEY

DR. AMULUMSALE

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING NAGPUR
AN AUTONOMOUS INSTITUTE
 AFFILIATED TO RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR
FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. MECHANICAL ENGINEERING

Course Category	Vocational skill enhancement course (VSEC-II)			
Sem:II	Total Hours Distribution per week			
Total Credit: - 02	Practical(P): - 04Hrs	Tutorial/Activity(T/A): - --Hr.		
Course Code:-	BT2ME07P	Course:- Personality Development and Communication LAB		
Examination Scheme				
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Total Marks	Minimum Passing Marks	Examination Duration
50	50	100	50	----Hours

Course Outcomes

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

CO1	Students will demonstrate verbal and non-verbal communication skills.
CO2	Students will apply personality development techniques for confidence, motivation, and self-improvement.
CO3	Students will work effectively in groups and exhibit leadership qualities.
CO4	Students will manage time efficiently and enhance creativity.
CO5	Students will Participate in GDs, presentations, and interviews with competence.

List of Practical's

Minimum Eight out of the following practicals shall be performed:

Sr. No.	List of Practical's
1	Introduction to communication process & Techniques.
2	Demonstrate 7c's of communication. Explain verbal & Non-verbal communication.
3	Description of Barriers to communication: Methods to overcome Barriers.
4	Acquire knowledge of listening & Speaking skills and Acquisition of Reading & writing skills. Exercise on technical writing, Practice on preparing abstracts.
5	Stage manners: Execute the skills of Grooming, Body language, voice modulation, speed. Development of positive Attitude, Emotional intelligence.
6	Deliver a structured introduction covering background, strengths, and career goals, meet and greet.
7	Developing skill on individual Presentation and Developing skill on group presentation.

SRPCE.MECHANICAL ENGG.

Version:1

Effective from Session :2026-

P. Bawale
24/7/26

P. Bawale
(M.P.D.SAHEKAR)
24/7/2026

P. Bawale
24/07/2026

P. Bawale
24/7/26

PRINCIPAL
RADHIKATAI PANDAV COLLEGE
NAGPUR

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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. MECHANICAL ENGINEERING

Course Category	Vocational Skill Enhancement Course (VSEC-II)			
Sem:II	Total Hours Distribution per week			
Total Credit: - 02	Practical (P): - 04 Hrs	Tutorial/Activity(T/A): - 2 Hrs.		
Course Code	BT2ME07P(C)	Course :-Advanced Excel Lab		
Examination Scheme				
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Total Marks	Minimum Passing Marks	Examination Duration
50	50	100	50	-----Hours

Course Objectives

After successful completion of this course the student will be able to:	
CO1	To develop advanced Microsoft Excel skills for efficient data management and analysis.
CO2	To learn and apply advanced formulas and functions
CO3	To create and customize PivotTables and Pivot Charts for data summarization.
CO4	To perform data validation, sorting, filtering, and advanced data analysis.

Course Outcomes

After successful completion of this course the student will be able to:	
CO1	Demonstrate Excel Interface navigation and data handling tools.
CO2	Apply cell referencing, formulas and functions to perform advanced calculations.
CO3	Create data visualization using charts, conditional formatting and dashboards.
CO4	Summarise large data sets using pivot tables, pivot charts and slicers for decision making.

Practical Guidelines

Sr. No.	Do's and Don't
1	Listen to faculty demo first. Don't start before explanation is complete.
2	Create a folder with Roll No, Name, Lab No. xlsx format. Save work every 10 min.
3	Don't play games, use social media or install software. Log out after saving.
4	Know the topics- Pivots, VLOOKUP and Macros while coming for practical.
5	Always carry pen drive and storage device while coming for practical.

SRPCE, MECHANICAL ENGG.

Version:-1

Effective from session 2026

SRPCE
24/7/26

Ritakhatole
24/7/26

P. Sawarkar
COLP.D.SAWARKAR
24/7/2026

Bhawane
24/07/2026

Atul
24/7/26

Dr. A. H. Hingale
24/7/26
PRINCIPAL
SMT. RADHIKATAI PANDAV COLLEGE
NAGPUR

List of Practical's
Minimum 8 out of the following 12 practicals shall be performed:

Sr. No.	List of Practical's
01	To study the basic features and user interface of Microsoft Excel.
02	To learn how to format data in Microsoft Excel.
03	To perform the calculations and logical operations using mathematical and logical function in Microsoft Excel.
04	To learn and perform data searching using the Lookup & V Lookup function.
05	To study and implement advanced functions in Microsoft Excel for efficient data analysis and management.
06	To learn and implement data validation in Microsoft Excel for controlling data entry and ensuring data accuracy.
07	To study and implement date and Text functions in Microsoft Excel.
08	To learn and perform data cleaning and data handling techniques using sorting, filtering and removing duplicates features in Microsoft Excel.
09	To learn and create different types of charts for visualizing data in Microsoft Excel.
10	To learn and perform data Summarization using Microsoft Excel for analyzing and presenting data effectively.
11	To automate repetitive tasks in Microsoft Excel using macros.
12	To automate repetitive tasks in Microsoft Excel using Visual Basic for Applications (VBA).

References Text Books Recommended:

1. Wayne Winston- Microsoft Excel 2021 Data Analysis and Business Modeling — 6th Edition.
2. Michael Alexander & Dick Kusleika- Power Programming with VBA — 1st Edition.
4. Michael R. Middleton Data Analysis Using Microsoft Excel. 4th Edition.

Reference Books Recommended:

1. Michael Alexander- Excel Dashboards and Reports — 3rd Edition.
2. Joseph Schmuller- Statistical Analysis with Excel for Dummies — 4th Edition.

Websites:-

- 1.Excel Training & Tutorials — Microsoft Support Team. Online Resource. Microsoft.com, 2026. Available at: www.support.microsoft.com/excel
- 2.Excel Easy – Learn Excel Online — Editorial Team. Online Resource. ExcelEasy.com,2026. Available at: www.excel-easy.comExcel

Note:

1. Conduct minimum 08 practical's out of above list.
2. Viva-voce question should be included in each of the practical.
3. **Continuous Internal Evaluation (CIE)**, 50 Internal Practical marks are distributed as 25 marks for regular performance of practicals, 15 Marks for Journal submission with viva-voce examination & 10 Marks for attendance.
4. **End Semester Exam (ESE)**, 50 External Practical marks are distributed as 30 marks for practical performance and 20 Marks for viva-voce examination
5. Eligibility of ESE Practical examination, **internal submission of Journal (Practical File) is mandatory.**

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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. MECHANICAL ENGINEERING

B. TECH. MECHANICAL ENGINEERING				
Course Category	Vocational Skill Enhancement Course – II (VSEC-II)			
Sem: II	Total Hours Distribution per week			
Total Credit: - 02	Practical (P): - 4 Hrs	Tutorial/Activity(T/A): - ---- Hr.		
Course Code	BT2ME07P	Course :- Digital Marketing LAB		
Examination Scheme				
Continuous Internal Evaluation (CIE)Marks	End Semester Exam (ESE) Marks	Total Marks	Minimum Passing Marks	Examination Duration
50	50	100	50	----- Hours

Course Outcomes

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

CO1	Use Search Engine Optimization tools for digital marketing campaigns
CO2	Use Search engine Optimization techniques in digital marketing
CO3	Use Social Media marketing to promote Various brands
CO4	Apply Search engine marketing techniques for creating effective advertising campaigns.
CO5	Use Websites analytics to improve the effectiveness of advertisements

Sr. No.	Practical's Guidelines
1	The laboratory assignments are to be submitted by students in the form of a journal
2	Journal consists of certificate , table of contents and handwritten write-up of each assignment.
3	Continuous assessment of laboratory work is done on overall performance and Laboratory performance of students.
4	Every evaluation for a laboratory assignment should offer a grade or marks based on parameters with appropriate weight age
5	Suggested parameters for overall assessment as well as each Laboratory assignment include timely completion , performance , efficiency , punctuality and neatness.

Minimum Eight out of the following practicals shall be performed:

List of Practical's

Sr. No.	List of Practical's
01	To gain hands-on experience with digital marketing techniques, including search engine optimization (SEO), social media marketing, email marketing, content marketing, and web analytics to promote a product or service effectively.
02	To create and configure a fully functional WordPress website using themes, plugins, and basic customization tools.
03	To understand and implement the fundamental techniques of Search Engine Optimization (SEO) to improve a website's visibility and ranking in search engine results.
04	To apply social media marketing techniques to promote a brand, engage with the target audience, and improve online presence.
05	To study the principles of content marketing and develop effective content for promoting a product, service, or brand through digital platforms.
06	To study the process of email marketing and create effective promotional email campaigns to engage customers and increase brand awareness.
07	To understand the concept and working of affiliate marketing by promoting products or services through affiliate links and analyzing their effectiveness in generating traffic, leads, or sales.
08	To study the sales funnel process and design an effective sales funnel for converting potential customers into loyal customers.
09	To study the principles of marketing automation and implement automated marketing campaigns using digital marketing tools.
10	To understand the fundamentals of web analytics by collecting, measuring, and analyzing website data to evaluate user behavior and improve website performance and digital marketing effectiveness.

Reference Books

1. Dave Chaffey, Fiona Ellis-Chadwick Digital Marketing: Strategy, Implementation and Practice Pearson Education
2. Melissa Barker, Donald I. Barker, Nicholas F. Bormann, Debra Zahay Social Media Marketing: A Strategic Approach Cengage Learning
3. Philip Kotler, Hermawan Kartajaya, Iwan Setiawan Marketing 5.0: Technology for Humanity Wiley

Note:

1. Conduct minimum 08 practical's out of above list.
2. Viva-voce question should be included in each of the practical.
3. **Continuous Internal Evaluation (CIE)**, 50 Internal Practical marks are distributed as 25 marks for regular performance of practicals, 15 Marks for Journal submission with viva-voce examination & 10 Marks for attendance.
4. **End Semester Exam (ESE)**, 50 External Practical marks are distributed as 30 marks for practical performance and 20 Marks for viva-voce examination
5. Eligibility of ESE Practical examination, **internal submission of Journal (Practical File) is mandatory.**

05	Study and demonstrate the Microstructure of Composite Material Subjected to Tensile Testing
06	Study and demonstrate the Microstructure of Heat-Treated Steels
07	Perform the Rockwell hardness test.
08	Prepare the Specimen and operate the Metallurgical Microscope for Microstructure Observation
09	Study and demonstrate of powder metallurgy process and sintered components.
10	Perform the Brinell hardness test.
11	Study and demonstrate Grinding, polishing and etching of metal specimens.
12	Study and demonstrate Microstructure of mild steel.

Text books names:-

1. V. D. Kodgire. Material Science and Metallurgy for Engineers, Everest Publishing House, Pune; Latest Edition.
2. O. P. Khanna. A Textbook of Material Science and Metallurgy, Dhanpat Rai Publications, New Delhi; Latest Edition.
3. R. K. Rajput. Engineering Materials and Metallurgy, S. Chand & Company Ltd., New Delhi; Latest Edition.

Reference Books:-

1. William D. Callister Jr. and David G. Rethwisch. Materials Science and Engineering: An Introduction, John Wiley & Sons; Latest Edition.
2. V. Raghavan. Materials Science and Engineering, Prentice Hall of India (PHI); Latest Edition.

Note:

1. Conduct minimum 08 practical's out of above list.
2. Viva-voce question should be included in each of the practical.
3. **Continuous Internal Evaluation (CIE)**, 50 Internal Practical marks are distributed as 25 marks for regular performance of practicals, 15 Marks for Journal submission with viva-voce examination & 10 Marks for attendance.
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SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING NAGPUR
AN AUTONOMOUS INSTITUTE
 AFFILIATED TO RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR
FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. MECHANICAL ENGINEERING

Course Category	Vocational skill enhancement course (VSEC-II)			
Sem:II	Total Hours Distribution per week			
Total Credit: - 02	Practical(P): - 04Hrs	Tutorial/Activity(T/A): - --Hr.		
Course Code:-	BT2ME07P	Course:- Engineering Metallurgy		
Examination Scheme				
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Total Marks	Minimum Passing Marks	Examination Duration
50	50	100	50	-

Course Outcomes

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

CO1	Identify the microstructure of low, medium & high carbon steels & correlated it with their mechanical Properties.
CO2	Identify the microstructure of cast irons & distinguish their characteristic & engineering application.
CO3	Examine the microstructure of non-Ferrous pure metals & alloys.
CO4	Perform hardness testing & interpret the effort of heat, treatment & material composition of hardness.
CO5	Demonstrate the powder metallurgy process including powder production ,compaction and sintering, and understand its industrial application.
CO6	Prepare metallographic specimens by grinding, polishing and etching techniques for micro structural examination.

List of Practical's

Minimum Eight out of the following practicals shall be performed:

Sr. No.	List of Practical's
01	Study and demonstrate the Microstructure of Low, Medium and High Carbon Steels
02	Study and demonstrate the Microstructure of Grey Cast Iron and White Cast Iron
03	Study and demonstrate the Microstructure of Non-Ferrous Pure Metals (Copper and Aluminium)
04	Study and demonstrate the Microstructure of Non-Ferrous Alloys (Brass and Bronze)

SRPCE, MECHANICAL ENGG.

VERSION:1.0

Effective from Session:2026-27

PRINCIPAL
 SMT. RADHIKATAI PANDAV COLLEGE
 NAGPUR

**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA, UMRER
ROAD, NAGPUR**

An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

**B.Tech. Mechanical Engineering/Civil Engineering/Electronics & Telecommunication
/Electrical Engineering/**

Computer Science & Engineering/Computer Engineering (NEP) (CBCS)

Sem-II	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L) :	Tutorial/Activity (T/A) : 4Hrs	
Subject Code	BT2ME08P/BT2CV08P/ BT2ET08P/BT2EE08P/BT2CS08P/ BT2CE08P	CC Basket-II (Yoga & Cultural Activities)	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
100 Marks	-	50	-

Course Objectives	
1	To understand the fundamental and benefits of yoga and cultural activities.
2	To develop physical fitness, strength, flexibility, and coordination.

SYLLABUS

1. Yoga Practices: Importance and types of yoga, Warm up and stretching exercise, Pranayam techniques, Suryanamaskar, safety precaution during yogapractice.

2. Health and Wellness: Stress management through yoga, Healthy lifestyle and nutrition, mindfulness and emotional balance.

3. Cultural Activities: Meaning and importance of culture activities, Indian art, music, dance, drama, folk tradition.

4. Cultural Excellence and Creative Expression: National festival, Regional festivals, college cultural festivals and competitions and Innovation.

Mrs. M. S. Palani

Dr. D. F. Shrivastava
21/07/2026
(Dr. S. K. V.) 09/07/2026

Sandesh R. Grandhe
09/07/2026