

VISION OF THE INSTITUTE

"To Empower Students With Knowledge, Skills, And Ethical Values, Driving Innovation And Bridge Academic Excellence With Real-World Applications In Engineering Technology And Management."

MISSION OF THE INSTITUTE

1. To provide quality education in engineering technology and management through innovative teaching methodologies and industry collaboration.
2. To develop skilled professionals with strong ethical values, leadership qualities, and a problem-solving mindset.
3. To promote interdisciplinary learning through collaboration with industry, academia, and research institutions.
4. To build a strong alumni network that fosters mentor ship , innovation and community engagement.

VISION OF THE DEPARTMENT

"To Be A Center Of Excellence In Artificial Intelligence And Data Science Through Innovation, Research, And Ethics".

MISSION OF THE DEPARTMENT

M1	To impart quality education in Artificial Intelligence and Data Science through outcome-based learning, strong fundamentals, and practical skill development.
M2	To promote innovation, research, entrepreneurship, and industry collaboration for developing intelligent and data-driven solutions to real-world challenges.
M3	To nurture ethical, competent, and socially responsible professionals through lifelong learning, leadership, and multidisciplinary practices.

Glurbe

Pipurbie

Ajayali

A.K. Bawankule

Prof. A.A. Thakare

Prof. P.R. Sawade

Prof. S. R. Ghorasolkar

Prof. S. B. Borkar

Prof. B. S. Shetkar

Prof. C. A. Bamble

PEO1: Engineering Knowledge and Technical Expertise

PEO2: Professional Excellence and Continuous Development

PEO3: Research, Innovation, and Social Responsibility

PROGRAMME OUTCOMES (POs)

Apply knowledge of mathematics, science, engineering fundamentals, Artificial Intelligence, and Data Science to solve complex engineering problems.

Identify, formulate, analyze, and interpret complex AI and data-driven problems using appropriate computational and analytical techniques.

PO3: Design and Development of Solutions
Design intelligent systems, machine learning models, and data-driven solutions that meet specified needs while considering societal, legal, and ethical requirements.

Conduct investigations using research methodologies, experimentation, statistical analysis, and interpretation of data to derive valid conclusions.

Select and apply appropriate AI frameworks, programming languages, cloud platforms, big data technologies, and software engineering tools with an understanding of their capabilities and limitations.

and apply appropriate AI frameworks, programming languages, cloud platforms, big data technologies, and software engineering tools with an understanding of their capabilities and limitations.

PO6: Engineer and Society.

Apply contextual knowledge to assess societal, legal, cultural, economic, and professional responsibilities while developing AI-based solutions.

PO7: Innovation and Entrepreneurship (Replaces Environment & Sustainability)

Demonstrate innovation, entrepreneurship, and design thinking to develop intelligent, scalable, and value-driven AI and Data Science solutions for industry and society.

PO8: Ethics

Apply ethical principles, professional integrity, fairness, transparency, privacy, and accountability in the design, development, and deployment of Artificial Intelligence systems.

PO9: Individual and Teamwork

Function effectively as an individual and as a member or leader in multidisciplinary and diverse teams.

PO10: Communication

Communicate effectively with technical and non-technical audiences through reports, presentations, technical documentation, and digital communication tools.

PO11: Leadership, Project Management, and Lifelong Learning

Demonstrate leadership, project management, entrepreneurship, financial awareness, and a commitment to lifelong learning to adapt to rapidly evolving Artificial Intelligence and Data Science technologies.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Technical Proficiency

Apply core Artificial Intelligence & Data Science concepts and modern technologies to design, develop, and deploy secure, intelligent, and efficient computing solutions for real-world applications.

PSO2: Professional and Innovative Competence

Demonstrate innovation, ethical practices, research, teamwork, entrepreneurship, and lifelong learning to address industrial and societal challenges.

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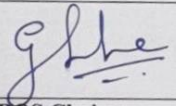
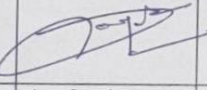
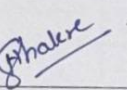
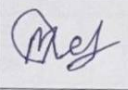
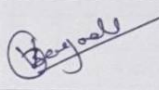
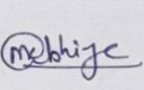
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SANMARG SHIKSHAN SANSTHA'S
SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BHANDARA
AN AUTONOMOUS INSTITUTE
B.TECH. CREDIT STRUCTURE

All BOS Chairman's of various departments are advised to maintain the credit structure of different semesters as given below
BOS Artificial Intelligence & Data Science (Choice Based Credit System)

Semester	Total credits	BSC	ESC	PCC	PEC	MDM	OE	VSEC	AEC	ENTR/ ECOI MANAG.	IKS	VEC	RM	C/PEP	PROJECT	INTER/ OJT	CC	Cumulative credit
B.Tech.-I SEM	22	7	9	-	-	-	-	2	2	-	-	-	-	-	-	-	2	22
B.Tech.-II SEM	22	8	6	2	-	-	-	2	-	-	2	-	-	-	-	-	2	44
B.Tech.-III SEM	21	-	-	10	-	2	3	-	-	2	-	2	-	2	-	-	-	65
B.Tech.-IV SEM	23	-	-	10	-	2	3	2	2	2	-	2	-	-	-	-	-	88
B.Tech.-V SEM	19	-	-	10	4	3	2	-	-	-	-	-	-	-	-	-	-	107
B.Tech.-VI SEM	21	-	-	8	8	3	-	2	-	-	-	-	-	-	-	-	-	128
B.Tech.-VII SEM	20	-	-	4	8	-	-	-	-	-	-	-	4	-	4	-	-	148
B.Tech.-VIII SEM	16	-	-	-	-	4	-	-	-	-	-	-	-	-	-	12	-	164
TOTAL CREDITS	164	15	15	44	20	14	8	8	4	4	2	4	4	2	4	12	4	164

						
BOS Chairperson	Academic Dean	Nominee By Vice Chancellor	Subject Experts From Outside Parent University	Industrial Expert	Alumni	Alumni

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR-440034

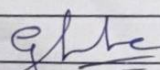
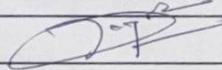
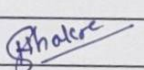
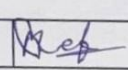
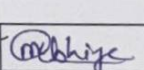
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Teaching Scheme of Examination for

B.Tech. Semester-I Artificial Intelligence & Data Science-NEP (Choice Based Credit System)2026-27

Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching			Total Hrs per Week	Total Credits	Examination Scheme								
					L	T	P			Theory				Practical			Min passing marks	Total Marks
										Exam. Hrs.	CIE	ESE	Total	CIE	ESE	Total		
1	BSC-I	BT1AD01T	Applied Mathematics-I	ASH	3	—	—	3	3	3	40	60	100	—	—	—	50	100
2	BSC-II	BT1AD02T	Applied Chemistry	ASH	3	—	—	3	3	3	40	60	100	—	—	—	50	100
3	BSC-II	BT1AD02P	Applied Chemistry (Lab)	ASH	—	—	2	2	1	—	—	—	—	25	25	50	25	50
4	ESC-I	BT1AD03T	Fundamentals of 'C' Programming	AIDS	3	-	—	3	3	3	40	60	100	—	—	—	50	100
5	ESC-I	BT1AD03P	Fundamentals of 'C' Programming (Lab)	AIDS	—	—	2	2	1	—	—	—	—	25	25	50	25	50
6	ESC-II	BT1AD04P	Integrated Computer Workshop (Lab)	AIDS	—	—	2	2	1	—	—	—	—	25	25	50	25	50
7	ESC-III	BT1AD05T	Basic of Electrical and Electronics Engineering	ETC	3	—	—	3	3	3	40	60	100	—	—	—	50	100
8	ESC-III	BT1AD05P	Basic of Electrical and Electronics Engineering (Lab)	ETC	—	—	2	2	1	—	—	—	—	25	25	50	25	50
9	VSEC-I	BT1AD06P	Web Design Technology (Lab)	AIDS	—	—	4	4	2	—	—	—	—	50	50	100	50	100
10	AEC-I	BT1AD07T	Communication Skill	ASH	2	—	—	2	2	2	20	30	50	—	—	—	25	50
11	CC-I	BT1AD08P	Refer CC- I Basket	ASH	—	—	4	4	2	—	—	—	—	100	—	100	50	100
			Total		14		16	30	22		180	270	450	250	150	400		850

Total Credits B-tech -I sem =22

					
BOS Chairperson	Academic Dean	Expert Nominated by Vice-Chancellor	Subject Experts From Outside Parent University	Industrial Expert	Alumni

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR

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Email: admin@srpce.ac.in Website: www.srpce.ac.in

B.Tech. Semester-I (Artificial Intelligence And Data Science)(NEP)2026-27

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

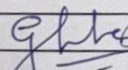
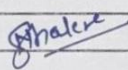
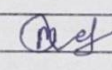
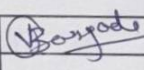
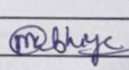
Course Category	Course Code	Name of Subject	Total Credits	Semester
Vocational Skill Enhancement Course (VSEC-I)	BT1AD06P	Web Design Technology (Lab)	2	I

Ability Enhancement Course (AEC-I)

Course Category	Course Code	Name of Course	Total Credits	Semester
Ability Enhancement Course (AEC-I)	BT1AD07T	Communication Skills	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)	BT1AD08P	National Social Services	2	I
	BT1AD08P	Games & Sports	2	
	BT1AD08P	Cultural Activities	2	
	BT1AD08P	Yoga	2	
	BT1AD08P	Elements of Japanese Language(NPTEL Online)	2	
	BT1AD08P	Elements of German Language(NPTEL Online)	2	
	BT1AD08P	Elements of French Language(NPTEL Online)	2	
	BT1AD08P	Elements of Spanish Language(NPTEL Online)	2	
	BT1AD08P	Elements of Spanish Language(NPTEL Online)	2	

					
BOS Chairperson	Academic Dean	Expert Nominated by Vice-	Subject Experts From Outside Parent University	Industrial Expert	Alumni

SMT. RADHIKAT PANDAV COLLEGE OF ENGINEERING, AGPUR-440034

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Teaching Scheme of Examination for

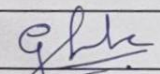
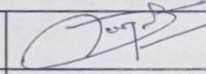
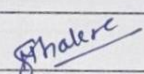
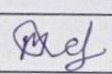
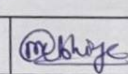
B.Tech. Semester-II Artificial Intelligence & Data Science -NEP (Choice Based Credit System)2026-27

Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching			Total Hrs per Week	Total Credits	Examination Scheme								
					L	T	P			Exam. Hrs.	Theory			Practical			Min Passing Marks	Total Marks
											CIE	ESE	Total	CIE	ESE	Total		
1	BSC-III	BT2AD01T	Probability And statistics	ASH	3			3	3	3	40	60	100				50	100
2	BSC-III	BT2AD01P	Probability And statistics (Lab)	ASH			2	2	1					25	25	50	25	50
3	BSC-IV	BT2AD02T	Applied Physics	ASH	3			3	3	3	40	60	100				50	100
4	BSC-IV	BT2AD02P	Applied Physics (Lab)	ASH			2	2	1					25	25	50	25	50
5	ESC-IV	BT2AD03T	Python programming language	AIDS	3			3	3	3	40	60	100				50	100
6	ESC-IV	BT2AD03P	Python programming language (Lab)	AIDS			2	2	1					25	25	50	25	50
7	ESC-V	BT2AD04T	Principle Of Digital Electronics	ETC	2			2	2	2	20	30	50				25	50
8	PCC-I	BT2AD05T	Computer Architecture and Organization	AIDS	2			2	2	2	20	30	50				25	50
9	IKS-I	BT2AD06T	Refer IKS Basket	ASH	2			2	2	2	20	30	50				25	50
10	VSEC-II	BT2AD07P	Refer VSEC-II Basket	AIDS			4	4	2					50	50	100	50	100
11	CC-II	BT2AD08P	Refer CC-II Basket	ASH			4	4	2					100		100	50	100
			Total		15		14	29	22		180	270	450	225	125	350		800

Total Credits B.tech -II Sem = 22

Cummulative Total Credits till B.Tech. II Semester=44

Exit Option : An Additional 8 credits as per exit basket

					
BOS Chairperson	Academic Dean	Expert Nominated by Vice-Chancellor	Subject Experts From Outside Parent University	Industrial Expert	Alumni

SMT. RADHIKATAI PANDAI COLLEGE OF ENGINEERING, NAGPUR

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Email: admin@srpce.ac.in Website: www.srpce.ac.in

B.Tech. Semester-II Artificial Intelligence & Data Science NEP (Choice Based Credit System)2026-27

List of Indian Knowledge System Courses (IKS)

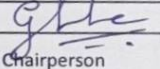
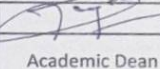
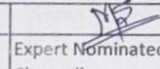
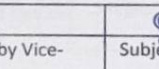
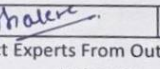
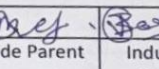
Course Category	Course Code	Name of Subject	Credits	Semester
Indian Knowledge System (IKS)	BT2AD06T	Consciousness Studies	2	II SEM
	BT2AD06T	Preserving Art, Cultural & Traditional	2	
	BT2AD06T	Wellness , Tradition Medicines & Yoga	2	
	BT2AD06T	Glimses of Ancient Science & Technology	2	

List of VSEC-II (Vocational Skill Enhancement Courses)

Course Category	Course Code	Name of Subject	Credits	Semester
VSEC-II (Vocational Skill Enhancement)	BT2AD07P	Linux and Shell Programming	2	II SEM
	BT2AD07P	Digital Marketing	2	

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

Course Category	Course Code	Name of Subject	Credits	Semester
Liberal Learning Courses(CC-II)	BT2AD08P	National Social Services(NSS)	2	II SEM
	BT2AD08P	Games & Sports	2	
	BT2AD08P	Cultural Activities	2	
	BT2AD08P	Yoga	2	
	BT2AD08P	Elements of Japanese Language(NPTEL Online)	2	
	BT2AD08P	Elements of German Language(NPTEL Online)	2	
	BT2AD08P	Elements of French Language(NPTEL Online)	2	
	BT2AD08P	Elements of Spanish Language(NPTEL Online)	2	
	BT2AD08P	Elements of Spanish Language(NPTEL Online)	2	

 BOS Chairperson	 Academic Dean	 Expert Nominated by Vice-Chancellor	 Subject Experts From Outside Parent University	 Industrial Expert	 Alumni
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SMT. RADHIKAT PANDAV COLLEGE OF ENGINEERING, NAGPUR-440034

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Teaching Scheme of Examination for

B.Tech. Semester-III Artificial Intelligence & Data Science-NEP (Choice Based Credit System)2026-27

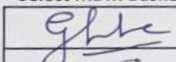
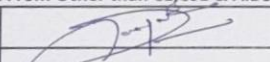
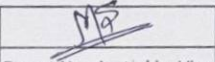
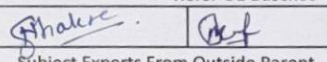
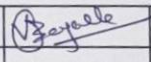
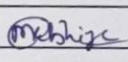
Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs.)			Total Hrs per Week	Total Credits	Examination Scheme								
					L	T	P			Exam. Hrs.	Theory			Practical			Min Passing Marks	Total Marks
											CIE	ESE	Total	CIE	ESE	TOTAL		
1	PCC-II	BT3AD01T	Data Structure	AIDS	3	_	_	3	3	3	40	60	100	_	_	_	50	100
2	PCC-II	BT3AD01P	Data Structure (Lab)	AIDS	_	_	2	2	1	_	_	_	_	25	25	50	25	50
3	PCC-III	BT3AD02T	Object-Oriented Programming	AIDS	3	_	_	3	3	3	40	60	100	_	_	_	50	100
4	PCC-III	BT3AD02P	Object-Oriented Programming (Lab)	AIDS	_	_	2	2	1	_	_	_	_	25	25	50	25	50
5	PCC-IV	BT3AD03T	Operating System	AIDS	2	_	_	2	2	2	20	30	50	_	_	_	25	50
6	MDM-I	BT3AD04T	Refer MDM Basket *	AIDS	2	_	_	2	2	2	20	30	50	_	_	_	25	50
7	OE-I	BT3AD05T	(Open Elective) Refer OE-I Basket **	AIDS	3	_	_	3	3	3	40	60	100	_	_	_	50	100
8	VEC-I	BT3AD06T	Startup And Business	MBA	2	_	_	2	2	2	20	30	50	_	_	_	25	50
9	HSSM-I	BT3AD07T	Constitution of India	AIDS	2	_	_	2	2	2	20	30	50	_	_	_	25	50
10	CEP	BT3AD08P	Community Engagenent Project	AIDS	_	_	4	4	2	_	_	_	_	50	50	100	50	100
			Total		17		10	27	21		200	300	500	150	100	250		750

Total Credits B.tech -III Sem = 21

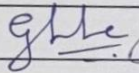
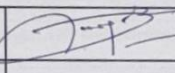
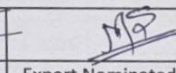
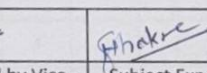
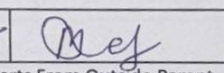
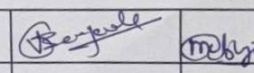
Cummulative Total Credits till B.Tech. III Semester=65

***Select MDM Basket From Other than CE,CSE & AIDS**

****Refer OE Bascket**

					
BOS Chairperson	Academic Dean	Expert Nominated by Vice-Chancellor	Subject Experts From Outside Parent University	Industrial Expert	Alumni

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR An Autonomous Institution UGC Approved & Affiliated to Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur Email: admin@srpce.ac.in Website: www.srpce.ac.in B.Tech. Semester-III Artificial Intelligence & Data Science NEP (Choice Based Credit System)2026-27				
Open Elective-Basket (Theory)				
Course Category	Course Code	Name of Subject	Credits	Semester
Open Elective - I(OE-I)	BT3AD05T	Principles of Management	3	III Sem
Open Elective - II(OE-II)	BT4AD05T	Stress Management	3	IV Sem
Open Elective - III(OE-III)	BT5AD06T	IPR Development & Training	2	V Sem

					
BOS Chairperson	Academic Dean	Expert Nominated by Vice-Chancellor	Subject Experts From Outside Parent University	Industrial Expert	Alumni

SMT. RADHIKAT PANDAV COLLEGE OF ENGINEERING, NAGPUR-440034

An Autonomous Institute

Teaching Scheme of Examination for

B.Tech. Semester-IV Artificial Intelligence & Data Science-NEP (Choice Based Credit System)2026-27

Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs.)			Total Hrs per Week	Total Credits	Examination Scheme									
					L	T	P			Exam. Hrs.	Theory			Practical			Min Passing Marks	Total Marks	
											CIE	ESE	Total	CIE	ESE	Total			
1	PCC-V	BT4AD01T	Introduction to Artificial Intelligence	AIDS	3	–	–	3	3	3	40	60	100	–	–	–	50	100	
2	PCC-V	BT4AD01P	Introduction to Artificial Intelligence (Lab)	AIDS	–	–	2	2	1	–	–	–	–	25	25	50	25	50	
3	PCC-VI	BT4AD02T	Design & Analysis of Algorithms	AIDS	3	–	–	3	3	3	40	60	100	–	–	–	50	100	
4	PCC-VII	BT4AD03T	Data Science	AIDS	2	–	–	2	2	2	20	30	50	–	–	–	25	50	
5	PCC-VII	BT4AD03P	Data Science (Lab)	AIDS			2	2	1					25	25	50	25	50	
6	MDM-II	BT4AD04T	Refer MDM Basket *	AIDS	2	–	–	2	2	2	20	30	50	–	–	–	25	50	
7	OE-II	BT4AD05T	(Open Elective-II) Refer OE-	AIDS	3	–	–	3	3	2	40	60	100	–	–	–	25	100	
8	VSEC-III	BT4AD06P	Technical Skill Development Phase-I	AIDS	–	–	4	4	2	–	–	–	–	50	50	100	50	100	
9	AEC-II	BT4AD07P	Professional Communication & Technical Writing	ASH	–	–	4	4	2	–	–	–	–	50	50	100	50	100	
10	HSSM-II	BT4AD08T	Fundamentals of Economics and Mangement	MBA	2	–	–	2	2	2	20	30	50	–	–	–	25	50	
11	VEC-II	BT4AD09T	Environmental Science	ASH	2	–	–	2	2	2	20	30	50	–	–	–	25	50	
Total						17		12	29	23		200	300	500	150	150	300		800

Total Credits B.tech -IV Sem = 23

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

Exit Option: An Additional 8 Credits as per Exit Basket

***Select MDM Basket From Other than CE,CSE & AIDS**

****Refer OE Basket**

SRPCE- AIIDS Chairperson	Academic Dean	Chancellor	VERSION-1.0	Subject Experts From Outside Parent	Industrial Expert	Effective From	Session:2026-27
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B.Tech. Semester-IV Artificial Intelligence & Data Science NEP (Choice Based Credit System)2026-27**Open Elective- Basket (Theory)**

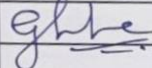
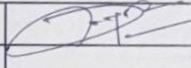
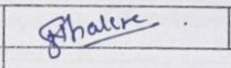
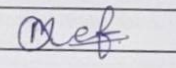
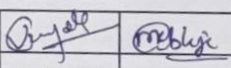
Course Category	Course Code	Name of Subject	Credits	Semester
Open Elective -I(OE-I)	BT3AD05T	Principles of Management	3	III Sem
Open Elective -II(OE-II)	BT4AD05T	Stress Management	3	IV Sem
Open Elective -III(OE-III)	BT5AD06T	IPR Development & Training	2	V Sem

Vocational & skill Enhancement Courses Category:- VSEC-III Basket

Course Category	Course Code	Name of Subject	Credits	Semester
VSEC-III	BT4AD06P	Technical Skill Development Phase-I	2	IV SEM

Ability Enhancement Course AEC-II Course

Course Category	Course Code	Name of Subject	Credits	Semester
AEC-II	BT4AD07P	Professional Communication & Technical Writing	2	IV SEM

					
BOS Chairperson	Academic Dean	Expert Nominated by Vice-Chancellor	Subject Experts From Outside Parent University	Industrial Expert	Alumni

SMT. RADHIKAT PANDAV COLLEGE OF ENGINEERING, NIPUR-440034

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Teaching Scheme of Examination for

B.Tech. Semester-V Artificial Intelligence & Data Science-NEP (Choice Based Credit System)2026-27

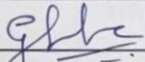
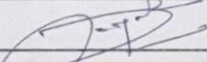
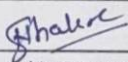
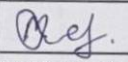
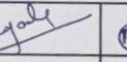
Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs)			Total Hrs per Week	Total Credits	Examination Scheme								
					L	T	P			Exam. Hrs.	Theory			Practical			Min Passing Marks	Total Marks
1	PCC-VIII	BT5AD01T	Database Management System	AIDS	3	—	—	3	3	3	40	60	100	—	—	—	50	100
2	PCC-VIII	BT5AD01P	Database Management System (Lab)	AIDS	—	—	2	2	1	—	—	—	—	25	25	50	25	50
3	PCC-IX	BT5AD02T	Machine Learning	AIDS	3	—	—	3	3	3	40	60	100	—	—	—	50	100
4	PCC-IX	BT5AD02P	Machine Learning (Lab)	AIDS	—	—	2	2	1	—	—	—	—	25	25	50	25	50
5	PCC-X	BT5AD03T	Theory Of Computation	AIDS	2	—	—	2	2	2	20	30	50	—	—	—	25	50
7	PEC-I	BT5AD04T	Program Elective-I	AIDS	3	—	—	3	3	3	40	60	100	—	—	—	50	100
8	PEC-I	BT5AD04P	Program Elective-I (Lab)	AIDS	—	—	2	2	1	—	—	—	—	25	25	50	25	50
9	MDM-III	BT5AD05T	Refer MDM Basket *	AIDS	3	—	—	3	3	3	40	60	100	—	—	—	50	100
11	OE-III	BT5AD06T	(Open Elective III)Refer OE-III Basket **	AIDS	2	—	—	2	2	2	20	30	50	—	—	—	25	50
Total					16	—	6	22	19	—	200	300	500	75	75	150	—	650

Total Credit B. Tech-V Sem = 19

Cummulative Total Credits till B.Tech. V Semester=108

*Select MDM Basket From Other than CE,CSE & AIDS

**Refer OE Basket

					
BOS Chairperson	Academic Dean	Expert Nominated by Vice-Chancellor	Subject Experts From Outside Parent University	Industrial Expert	Alumni

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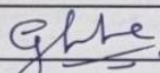
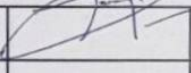
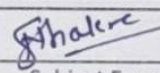
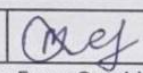
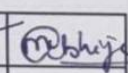
B.Tech. Semester-V Artificial Intelligence & Data Science - NEP (Choice Based Credit System)2026-27

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

Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Courses - I (PEC-I)	BT5AD04T	Data Visualization Techniques	3	V SEM
	BT5AD04P	Data Visualization Techniques (Lab)	1	
	BT5AD04T	Information Security	3	
	BT5AD04P	Information Security(Lab)	1	
	BT5AD04T	Cloud Computing	3	
	BT5AD04P	Cloud Computing(Lab)	1	

Open Elective- Basket (Theory)

Course Category	Course Code	Name of Subject	Credits	Semester
Open Elective - I(OE-I)	BT3AD05T	Principles of Management	3	III Sem
Open Elective - II(OE-II)	BT4AD05T	Stress Management	3	IV Sem
Open Elective - III(OE-III)	BT5AD06T	IPR Development & Training	2	V Sem

					
BOS Chairperson	Academic Dean	Expert Nominated by Vice-Chancellor	Subject Experts From Outside Parent University	Industrial Expert	Alumni

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR-440034

An Autonomous Institute

Teaching Scheme of Examination for

B.Tech. Semester-VI Artificial Intelligence & Data Science-NEP (Choice Based Credit System)2026-27

Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs.)			Total Hrs per Week	Total Credits	Examination Scheme								
					L	T	P			Exam Hrs.	Theory			Practical			Min Passing Marks	Total Marks
											CIE	ESE	Total	CIE	ESE	Total		
1	PCC-XI	BT6AD01T	Deep Learning	AIDS	3	—	—	3	3	3	40	60	100	—	—	—	50	100
2	PCC-XI	BT6AD01P	Deep Learning(Lab)	AIDS	—	—	2	2	1	—	—	—	—	25	25	50	25	50
3	PCC-XII	BT6AD02T	Big Data Analytics	AIDS	3	—	—	3	3	3	40	60	100	—	—	—	50	100
4	PCC-XII	BT6AD02P	Big Data Analytics(Lab)	AIDS	—	—	2	2	1	—	—	—	—	25	25	50	25	50
5	PEC-II	BT6AD03T	Program Elective-II	AIDS	3	—	—	3	3	3	40	60	100	—	—	—	50	100
6	PEC-II	BT6AD03P	Program Elective-II(Lab)	AIDS	—	—	2	2	1	—	—	—	—	25	25	50	25	50
7	PEC-III	BT6AD04T	Program Elective-III	AIDS	3	—	—	3	3	3	40	60	100	—	—	—	50	100
8	PEC-III	BT6AD04P	Program Elective-III(Lab)	AIDS	—	—	2	2	1	—	—	—	—	25	25	50	25	50
9	MDM-IV	BT6AD05T	Refer MDM Basket *	AIDS	3	—	—	3	3	3	40	60	100	—	—	—	50	100
10	VSEC-IV	BT6AD06P	Technical Skill Development Phase-II	AIDS	—	—	4	4	2	—	—	—	—	50	50	100	50	100
			Total		15		12	27	21		200	300	500	150	150	300		800

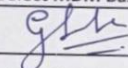
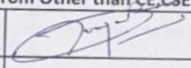
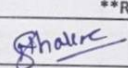
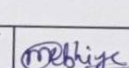
Total Credits B.Tech-VI Sem = 21

Exit Option: An Additional 8 Credits as per Exit Basket

***Select MDM Basket From Other than CE,CSE & AIDS**

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

****Refer OE Basket**

					
BOS Chairperson	Academic Dean	Expert Nominated by Vice-Chancellor	Subject Experts From Outside Parent University	Industrial Expert	Alumni

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR

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B.Tech. Semester-VI Artificial Intelligence & Data Science - NEP(Choice Based Credit System)2026-27

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

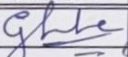
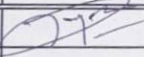
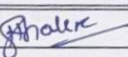
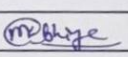
Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Courses II (PEC-II)	BT6AD03T	Computer Vision	3	VI SEM
	BT6AD03P	Computer Vision (Lab)	1	
	BT6AD03T	Power BI	3	
	BT6AD03P	Power BI(Lab)	1	
	BT6AD03T	Augmented Reality &Virtual Reality	3	
	BT6AD03P	Augmented Reality &Virtual Reality (Lab)	1	

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

Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Courses III(PEC-III)	BT6AD04T	Computer Network	3	VI SEM
	BT6AD04P	Computer Network (Lab)	1	
	BT6AD04T	Reinforcement Learning	3	
	BT6AD04P	Reinforcement Learning (Lab)	1	
	BT6AD04T	AI for Cyber Security	3	
	BT6AD04P	AI for Cyber Security (Lab)	1	

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

Course Category	Course Code	Name of Subject	Credits	Semester
Vocational Skill Enhancement Courses -IV	BT6AD06P	Technical Skill Development Phase-II	2	VI SEM

					
BOS Chairperson	Academic Dean	Expert Nominated by Vice-Chancellor	Subject Experts From Outside Parent University	Industrial Expert	Alumni

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, AGPUR-440034

An Autonomous Institute

Teaching Scheme of Examination for

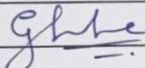
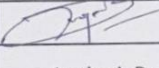
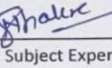
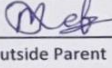
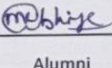
B.Tech. Semester-VII Artificial Intelligence & Data Science-NEP (Choice Based Credit System)2026-27

Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs.)			Total Hrs per Week	Total Credits	Examination Scheme								
					L	T	P			Exam. Hrs.	Theory			Practical			Min Passing Marks	Total Marks
											CIE	ESE	Total	CIE	ESE	Total		
1	PCC-XIII	BT7AD01T	Natural Language Processing	AIDS	3	—	—	3	3	3	40	60	100	—	—	—	50	100
2	PCC-XIII	BT7AD01P	Natural Language Processing (Lab)	AIDS	—	—	2	2	1	—	—	—	—	25	25	50	25	50
3	PEC-IV	BT7AD03T	Program Elective-IV	AIDS	3	—	—	3	3	3	40	60	100	—	—	—	50	100
4	PEC-IV	BT7AD03P	Program Elective-IV (Lab)	AIDS	—	—	2	2	1	—	—	—	—	25	25	50	25	50
5	PEC-V	BT7AD04T	Program Elective-V	AIDS	3	—	—	3	3	3	40	60	100	—	—	—	50	100
6	PEC-V	BT7AD04P	Program Elective-V (Lab)	AIDS	—	—	2	2	1	—	—	—	—	25	25	50	25	50
7	RM	BT7AD05T	Research Methodology *	AIDS	3			3	3	3	40	60	100	—	—	—	50	100
8	RM	BT7AD05P	Research Methodology (Lab) *	AIDS	—	—	2	2	1	—	—	—	—	25	25	50	25	50
9	PROJECT	BT7AD06P	Major Project	AIDS	—	—	8	8	4	—	—	—	—	100	100	200	200	200
			Total		12		16	28	20		160	240	400	200	200	400		800

Total Credits B.tech -VII Sem = 20

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

Indicates that Online Courses to be done from NPTEL/SWYAM/MOOCs. Examination will be conducted by NPTEL/INSTITUTE

					
BOS Chairperson	Academic Dean	Expert Nominated by Vice-Chancellor	Subject Experts From Outside Parent University	Industrial Expert	Alumni

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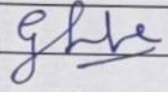
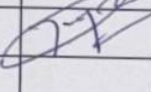
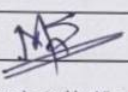
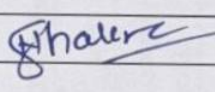
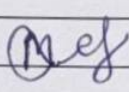
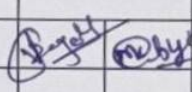
B.Tech. Semester-VII Artificial Intelligence & Data Science - NEP (Choice Based Credit System) 2026-27

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

Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Courses-IV (PEC-IV)	BT7AD03T	Graph Machine Learning	3	VII SEM
	BT7AD03P	Graph Machine Learning(Lab)	1	
	BT7AD03T	Generative Artificial Intelligence	3	
	BT7AD03P	Generative Artificial Intelligence (Lab)	1	
	BT7AD03T	Ethics & Responsible AI	3	
	BT7AD03P	Ethics & Responsible AI (Lab)	1	

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

Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Courses-V (PEC-V)	BT7AD04T	Agentic AI	3	VII SEM
	BT7AD04P	Agentic AI (Lab)	1	
	BT7AD04T	Intelligent Robotics	3	
	BT7AD04P	Intelligent Robotics (Lab)	1	
	BT7AD04T	Human Computer Interaction	3	
	BT7AD04P	Human Computer Interaction (Lab)	1	

					
BOS Chairperson	Academic Dean	Expert Nominated by Vice-Chancellor	Subject Experts From Outside Parent University	Industrial Expert	Alumni

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, AGPUR-440034

An Autonomous Institute

Teaching Scheme of Examination for

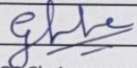
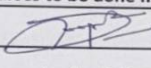
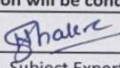
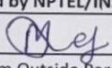
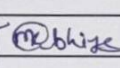
B.Tech. Semester-VIII Artificial Intelligence & Data Science-NEP (Choice Based Credit System)2026-27

Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs.)			Total Hrs per Week	Total Credits	Examination Scheme								
					L	T	P			Exam. Hrs.	Theory			Practical			Min Passing Marks	Total
											CIE	ESE	Total	CIE	ESE	Total		
1	MDM-V	BT8AD01T	Refer MDM Basket *#	AIDS	2	—	—	2	2	2	20	30	50	—	—	—	25	50
2	MDM-VI	BT8AD02T	Refer MDM Basket *#	AIDS	2	—	—	2	2	2	20	30	50	—	—	—	25	50
3	OJT	BT8AD04P	Internship	AIDS	—	—	24	24	12	—	—	—	—	200	200	400	200	400
			Total		4		24	28	16		40	60	100	200	200	400	250	500

Total Credits B.tech -VIII Sem = 16

Cummulative Total Credits till B.Tech. VIII Semester=168

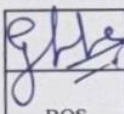
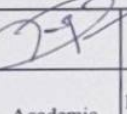
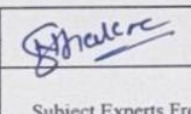
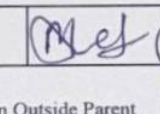
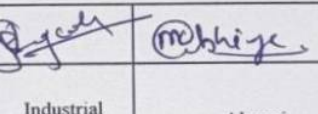
Indicates that Online Courses to be done from NPTEL/SWYAM/MOOCs. Examination will be conducted by NPTEL/INSTITUTE

					
BOS Chairperson	Academic Dean	Expert Nominated by Vice-Chancellor	Subject Experts From Outside Parent University	Industrial Expert	Alumni

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B.Tech. Artificial Intelligence & Data Science NEP (Choice Based Credit System)

Multidisciplinary Minor Course

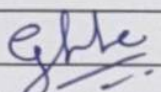
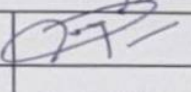
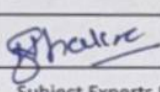
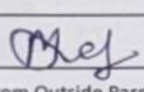
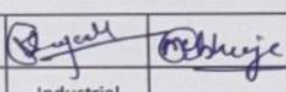
Course Category	Course Code	Name of Subject	Credits	Semester	Applicable to Students
MDM-I	BT3AD04T	Data Structure	2	III	Civil, Electronics & Telecommunication, Mechanical, Electrical Engineering
MDM-II	BT4AD04T	Database Management system	2	IV	
MDM-III	BT5AD05T	Fundamental of Computer Network	3	V	
MDM-IV	BT6AD05T	Artificial Intelligence	3	VI	
MDM-V	BT8AD01T	Data Science	2	VIII	
MDM-VI	BT8AD02T	Cyber Security	2	VIII	

					
BOS Chairperson	Academic Dean	Expert Nominated by Vice-Chancellor	Subject Experts From Outside Parent University	Industrial Expert	Alumni

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An Autonomous Institution
 UGC Approved & Affiliated to Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur
 Email: admin@srpce.ac.in Website: www.srpce.ac.in
B.Tech. Artificial Intelligence & Data Science NEP (Choice Based Credit System)2026-27

Open Elective-Basket (Theory)

Course Category	Course Code	Name of Subject	Credits	Semester
Open Elective -I(OE-I)	BT3AD05T	Principles of Management	3	III Sem
Open Elective -II(OE-II)	BT4AD05T	Stress Management	3	IV Sem
Open Elective -III(OE-III)	BT5AD06T	IPR Development & Training	3	V Sem

					
BOS Chairperson	Academic Dean	Expert Nominated by Vice-Chancellor	Subject Experts From Outside Parent University	Industrial Expert	Alumni

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR-4400340

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B. Tech. of Artificial Intelligence and Data Science NEP (Choice Based Credit System)

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

Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Course-I (PEC-I)	BT5AD04T	Data Visualization Techniques	3	V-SEM
	BT5AD04P	Data Visualization Techniques(Lab)	1	
	BT5AD04T	Information Security	3	
	BT5AD04P	Information Security(Lab)	1	
	BT5AD04T	Cloud Computing	3	
	BT5AD04P	Cloud Computing(Lab)	1	

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

Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Course-II (PEC-II)	BT6AD03T	Computer Vision	3	VI- SEM
	BT6AD03P	Computer Vision(Lab)	1	
	BT6AD03T	Power BI	3	
	BT6AD03P	Power BI(Lab)	1	
	BT6AD03T	Augmented Reality and Virtual Reality	3	
	BT6AD03P	Augmented Reality and Virtual Reality(Lab)	1	

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

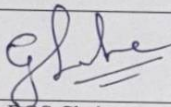
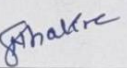
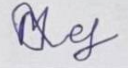
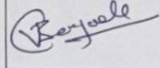
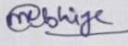
Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Course- III (PEC-III)	BT6AD04T	Computer Network	3	VI- SEM
	BT6AD04P	Computer Network(Lab)	1	
	BT6AD04T	Reinforcement Learning	3	
	BT6AD04P	Reinforcement Learning(Lab)	1	
	BT6AD04T	AI For Cyber Security	3	
	BT6AD04P	AI For Cyber Security(Lab)	1	

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

Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Course- IV (PEC-IV)	BT7AD03T	Graph Machine Learning	3	VII- SEM
	BT7AD03P	Graph Machine Learning(Lab)	1	
	BT7AD03T	Generative Artificial Intelligent	3	
	BT7AD03P	Generative Artificial Intelligent(Lab)	1	
	BT7AD03T	Ethics & Responsible AI	3	
	BT7AD03P	Ethics & Responsible AI(Lab)	1	

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

Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Course- V (PEC-V)	BT7AD04T	Agentic AI	3	VII- SEM
	BT7AD04P	Agentic AI (lab)	1	
	BT7AD04T	Intelligent Robotics	3	
	BT7AD04P	Intelligent Robotics(Lab)	1	
	BT7AD04T	Human Computer Interaction	3	
	BT7AD04P	Human Computer Interaction (Lab)	1	

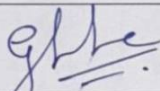
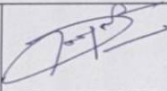
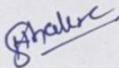
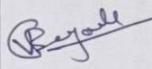
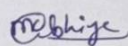
						
BOS Chairperson	Academic Dean	Nominee By Vice Chancellor	Subject Experts From Outside Parent University		Industrial Expert	Alumni

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR-440034
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B. Tech. Artificial Intelligence & Data Science NEP(Choice Based Credit System)

Program Core Course (Major Courses)

Course Category	Course Code	Name of Subject	Credits	Semester
PCC-I	BT2AD05T	Computer Architecture and Organization	02	II Sem
PCC-II	BT3AD01T	Data Structure	03	III Sem
PCC-II	BT3AD01P	Data Structure (Lab)	01	
PCC-III	BT3AD02T	Object-Oriented Programming	03	
PCC-III	BT3AD02P	Object-Oriented Programming (Lab)	01	
PCC-IV	BT3AD03T	Operating System	02	
PCC-V	BT4AD01T	Introduction to Artificial Intelligence	03	IV Sem
PCC-V	BT4AD01P	Introduction to Artificial Intelligence(Lab)	01	
PCC-VI	BT4AD02T	Design & Analysis of Algorithms	03	
PCC-VI	BT4AD02P	Design & Analysis of Algorithms(Lab)	01	
PCC-VII	BT4AD03T	Data Science	02	
PCC-VIII	BT5AD01T	Database Management System	03	V Sem

PCC-VIII	BT5AD01P	Database Management System(Lab)	01	
PCC-IX	BT5AD02T	Machine Learning	03	
PCC-IX	BT5AD02P	Machine Learning(Lab)	01	
PCC-X	BT5AD03T	Theory Of Computation	02	
PCC-XI	BT6AD01T	Deep Learning	03	VI Sem
PCC-XI	BT6AD01P	Deep Learning(Lab)	01	
PCC-XII	BT6AD02T	Big Data Analytics	03	
PCC-XII	BT6AD02P	Big Data Analytics(Lab)	01	
PCC-XIII	BT7AD01T	Natural Language Processing	03	VII Sem
PCC-XIII	BT7AD01P	Natural Language Processing(Lab)	01	

						
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ROAD, NAGPUR**

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Faculty of Science & Technology

B. Tech. Artificial Intelligence and Data Science (NEP) (CBCS)

Sem-I	Total Hours Distribution Per Week		
Total Credits : 3	Lecture (L) : 3 Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT1AD01T	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.

Contd.

(Signature)
Dr. D. P. Shastri
05/08/2026

(Signature)
Mrs. M. S. Patel
05/08/2026

(Signature)
05/08/2026
(Dr. S. K. Khar)

(Signature)
Dr. R. V. Hanane
05/08/2026

(Signature)
05/08/2026
(Dr. S. K. Khar)

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. Shastri, Engineering Mathematics, Volume I and II, S. Chand.

05/08/2020
(Dr. Jyoti Chavhan)

05/08/2020
Dr. D.F. Shastri

05/08/2020
Mrs. M.S. Pali
05/08/2020

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

B.Tech. Artificial Intelligence & Data Science (NEP) (CBCS)

Sem-I	Total Hours Distribution Per Week		
Total Credits : 3	Lecture (L) : 3 Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT1AD02T	Applied Chemistry	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
40 Marks	60 Marks	50	3 Hours

Course Objectives	
1	To provide fundamental knowledge of electrochemistry necessary to understand the function of batteries.
2	To gain an understanding of the rare earth metals and waste handling generated out of their uses.
3	Explain the synthesis and characterization techniques used for nanomaterials.

Course Outcomes	
After completion of syllabus, students would be able to	
1	Analyze the various industrial problems arising water quality and their remediation.
2	They will understand the role of nanomaterial's and their applications.
3	Students will be able to apply the basics concepts of battery technology & energy storage devices.
4	Understand the degradation of metal kinetics of corrosion and implement corrosion control method.
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.

Mr. S. Patil
05/08/26

Dr. A. Vaidya
05/08/26

Dr. D. P. Shastri
05/08/2026

D.P. Chauhan
05/08/26

Contd.

P.A. Patil
05/08/26

SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1: Water Chemistry			
Introduction, potable water quality parameters hardness 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		1
Unit-2: Nanomaterial's for engineering applications			
Introduction of nanomaterial's, Synthesis of nanomaterials- Top down and bottom-up approach. Carbon nanomaterials: Types, properties and applications of CNT and graphene. Applications of nanomaterial. Chemical sensor types and applications.	7		2
Unit-3: Electrochemical Power system			
Fundamental of Electrochemical energy storage and modern battery technologies. Topics include basic electrochemistry, electrochemical cell Lithium cobalt oxide, Super capacitors with examples and applications. Introduction, characteristics of H ₂ -O ₂ fuel cells, amorphous Si and quantum dye sensitized solar cells.	8		3
Unit-4: Corrosion			
Corrosion- Introduction , Cause, Types (dry, wet, differential aeration) , Prevention method (cathodic protection, Protective coating , galvanizing, Tinning).	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

Text/Reference Books:

1. M Afshar Alam, Sapna Jain, Hena Parveen, Green Computing Approach Towards Sustainable Development, Wiley Interscience Publications.
2. S. S. Dara, A Textbook of Engineering Chemistry, S. Chand Publications
3. Shikha Agrawal, 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

(Dr. P. Vaish)
05/08/26
17-5-2026
05/08/26

(Dr. S. Khan)
05/08/2026
05/08/2026
05/08/2026

(Dr. P. Chauhan)
05/08/26
D. P. Chauhan

(Dr. P. A. Patel)
05/08/26
P. A. Patel

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Faculty of Science & Technology

B.Tech. Artificial Intelligence & Data Science (NEP) (CBCS)

Sem I		Total Hours Distribution Per Week		
Total Credits :1	Lecture (L) : 0Hrs	Tutorial T : 0 Hr	Practical P: 2Hr	
Subject Code	BT1AD02P	Applied Chemistry Lab		
Examination Scheme				
CIE	ESE	Minimum Passing Marks:	Examination Duration:	
25 Marks	25 Marks	25 Marks	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	Prepare standard solution and perform quantitative analysis using volumetric and instrumental method.
2	Perform quantitative chemical analysis using standard laboratory Procedure with accuracy.

Sr. no	List of Practical (Any 6-performance based and 1 virtual lab experiment)
1.	Estimation of Copper estimation (iodometrically)
2.	Estimation of Ni by complexometry.
3.	To determine the rate of corrosion of given metal specimen by the weight-loss method.
4.	Redox titration by potentiometry
5.	Estimate the amount of dissolved oxygen present in water sample.
6.	Acid base titration by conductometry
7.	To determine the total hardness of given water sample by EDTA complexometry method.
8.	Virtual Lab: Beer's Law verification by spectrophotometer.

(Signature)
05/08/26
Dr. A. V. Mankar
05/08/26
Dr. M. S. Patil

(Signature)
05/08/2021
Dr. S. Kharad
Dr. D. P. Shambhu

(Signature)
05/08/26
D. P. Chauhan

(Signature)
05/08/26
P. A. Patil

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING NAGPUR
AN AUTONOMOUS INSTITUTE
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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. ARTIFICIAL INTELLIGENCE & DATA SCIENCE

Course Category	Engineering Science Course –I (ESC-I)		
Sem:I	Total Hours Distribution per week - 3		
Total Credit: 3	Lecture (L): 3Hrs	Tutorial/Activity(T/A): --	
Subject Code	BT1AD03T(Th)	Fundamentals of ‘C’ Programming	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	Semester End Exam(SEE)Marks	Minimum Passing Marks	Examination Duration
40	60	50	3 Hours

Course Objectives

1	To understand the basics, history, and structure of the C programming language
2	Develop simple C programs to illustrate the applications of different data types such as arrays, pointers, functions

Course Outcomes

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

CO1	Build a strong foundation in C programming for developing logical thinking and problem-solving skills.
CO2	Implement C programs using conditional and iterative control structures to solve complex computational problems efficiently
CO3	Demonstrate optimized C solutions using arrays, matrices, and string manipulation techniques for computational and data-processing applications.
CO4	Use functions for modular programming
CO5	Apply efficient C programs using pointers and file handling techniques for effective memory management and persistent data processing.

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M. G. G. Gule

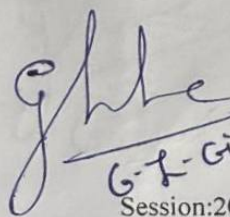
MS
Dr. M. Chaudhari

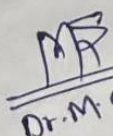
Abhije
M. Gajbhiye

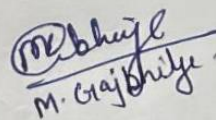
Phalere
Nitin. Thakre

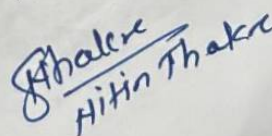
Vaishav Kabsogade

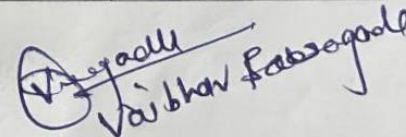
SYLLABUS		
Contents	No. of hours	Mapped With CO Number
Unit I introduction to C: History of C, Features of C, Structure of C program, Character Set, C Tokens, Keywords, Identifiers, Constants, Variables, data types, Operators, variable declaration, Assigning Value to variable, Introduction to Computing: Algorithm, Flowchart, Representation of Algorithm and Flowchart with examples. Operator and Expression: Arithmetic, Relational, Logical, Assignment, Increment and Decrement, Conditional operator, Bitwise operators, sizeof operator, Arithmetic Expression, Evaluation expression. Expressions, Precedence and Associativity, Expression Evaluation, Type conversion.	9	1
Unit II: Conditional Statements 'if' Statement, 'if..else' statement, Nested if Statements, ladder if ... else, Ternary operator, switch case. Control Flow Statements The while Statement, The do .. while Statement, The for Statement, The break, continue Statements and goto Statement	8	2
Unit III One-dimensional Arrays, Declaration of One-dimensional Arrays, Initialization of One-dimensional Arrays, Example programs- Linear search, Binary search, Bubble sort, Selection sort. Two-dimensional Arrays, Declaration of Two-dimensional Arrays, Initialization of Two-dimensional Arrays, Example programs – Matrix Addition, Multiplication, Transpose of a matrix, Character Arrays and Strings: Declaring and Initializing String, String-handling Functions (strlen(), strcpy(), strcmp(), strcat(), strrev()), Example Programs (with and without using built-in string functions), Two-dimensional character arrays.	9	3
Unit IV Function: Syntax and Declaration of Function, Type of Function, Create a function, Scope of function return function, call by reference. Recursion: Recursion as a different way of solving problems.. Structure: Defining structures and Array of structures, Declaration and Initialization of structure. Unions: Union Declaration, Initializing Unions	8	4
Unit V Pointers: Idea of pointers, defining pointers, Declaration and Initialization of pointer, Type of pointer, Pointer using Array, pointer to pointer Function pointer. File handling Basics of File Handling In C, Types of Files, File Input/ Output Operations: Modes of file opening, Reading and writing the file, Closing the files, .	8	5


 G. F. Girdle
 Session:2026-27


 Dr. M. Chaudhary
 BOS:-AIDS Version:-1


 M. Gajbhiye


 Atin Thakre


 Vaibhav Pansare

W.e.f.:01/July/2026

References –

Text Book-

- 1 B. W. Kernighan and D. M. Ritchie, The C Programming Language , Second Edition, Pearson, June 2015
2. E. Balagurusamy Programming in ANSI C, 5th Edition, Tata McGraw-Hill Publications
3. Yashwant Kanetkar Letus C, 6th Edition, BPB publication
4. H. Schildt, Turbo C: The Complete Reference, 4th Edition, 2000, McGraw Hill Education.

Reference Book

1. An Introduction to Data Structure with Applications, Tremblay J.P. and Sorenson P.G, Tata McGraw Hill Pub Co. Ltd
2. Programming in ANSI C: E. Balguruswami McGraw Hill
3. Understanding Pointers in C, Yashwant P. Kanetkar 4th Edition, 2013 BPB publication.

URL –

- 1 <https://www.w3schools.com/c/>
- 2 <https://www.geeksforgeeks.org/c/c-programming-language/>

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MS
Dr. M. Chaudhary

M. Ghajjar
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Thalere
Mitha Thalere

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING NAGPUR
AN AUTONOMOUS INSTITUTE
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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. ARTIFICIAL INTELLIGENCE & DATA SCIENCE

Course Category	Engineering Science Course –I(ESC-I)		
Sem:I	Total Hours Distribution per week- 2		
Total Credit: 1	Practical(P): 2.Hrs	Tutorial/Activity(T/A):	
Subject Code	BT1AD03P (Practical)	Fundamentals of ‘C’ Programming (Lab)	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	Semester End Exam(SEE)Marks	Minimum Passing Marks	Examination Duration
25	25	25	–

Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	Apply C language fundamentals, including variables, data types, operators, expressions, and input/output statements, to solve programming problems.
CO2	Implement various concepts of arrays and strings and pointers.
CO3	Create programs using user defined data types and functions in C.
CO4	Develop, Debug and Execute programs to demonstrate the basic concepts of pointers in C
CO5	Implement various concepts of files.

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MS
Dr. M. Chaudhari
G.S. Girhe

Abhiye
M. G. Abhiye

Thalere
Nitin Thalere

Waghmare
Vishwan B. Waghmare

List of Practical's

Following practical's shall be performed:

Sr. No.	List of Practical's
01	Execute a program to swap two variables values with and without using third variable.
02	Develop a C Program to implement a simple calculator to perform addition, subtraction, multiplication and division operations using switch construct.
03	Develop a C Program to find the roots of quadratic equation for non-zero co- efficient using if-else ladder construct.
04	Program to calculate the factorial of given number.
05	Program to generate Fibonacci sequence upto n terms.
06	Develop a recursive C function to find the factorial of a number, $n!$, defined by $\text{fact}(n)=1$, if $n=0$. Otherwise $\text{fact}(n)=n*\text{fact}(n-1)$. Using this function, develop a C program to compute the Binomial coefficient nCr . Perform input validation as well.
07	Develop a C program to find the smallest and largest elements in an array using pointers and then swap these elements and display the resultant array
08	Develop a C program to read two matrices A ($m \times n$) and B ($p \times q$) and compute the product of the two matrices. Print both the input matrices and resultant matrix with suitable headings and output should be in matrix format only.
09	Develop a C program to count the vowels & consonants in a given string.
10	Design a C program with a recursive function to calculate the factorial of a given positive integer.
11	Program to create and display employee details using structures.
12	Program to write text to a file.
13	Program to copy contents from one file to another file.

Note:

1. Conduct above practical's from 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) practicalMarks, 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)practicalMarks,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.

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G.L. Ghosh

M. Chaudhary
M. Chaudhary

M. Gajbhiye
M. Gajbhiye

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H.N. Thakre

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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. ARTIFICIAL INTELLIGENCE & DATA SCIENCE

ARTIFICIAL INTELLIGENCE & DATA SCIENCE			
Course Category	Engineering Science Course -II (ESC-II)		
Sem: I	Total Hours Distribution per week		
Total Credit: 01	Practical(P): 02Hrs	Tutorial/Activity(T/A):Hr.	
Subject Code	BT1AD04P(Practical)	Integrated Computer Workshop Lab	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	Semester End Exam(SEE)Marks	Minimum Passing Marks	Examination Duration
25	25	25	---

Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	Identify the components of a PC and Assemble & disassemble the same..
CO2	Experiment with installation of Operating System and Secure a computer from Cyber threats.
CO3	Develop presentation /documentation using Office tools.
CO4	Build dialogs and documents using ChatGPT.
CO5	Improve individual / teamwork skills, communication and report writing skills with ethical values..

List of Practical's

following practical's shall be performed:

Sr. No.	List of Practical's
01	Exploration and Effective Use of Electronic components ICs, resistor, capacitor, Transistors MOSFET etc.
02	Exploration of computer peripheral devices . Identify input, output, and storage devices
03	To Install and assemble computer hardware components correctly and verify their proper functioning.
04	To Install the Microsoft Windows XP operating system on computer system
05	To Install the LINUX operating system on a computer system .

06	Create a newsletter using Microsoft Word by applying features like columns, images, textboxes, WordArt, and basic formatting.
07	Design and Development of a Newsletter Using Microsoft Word Advanced Formatting Tools.
08	Learn basic spreadsheet operation and create a scheduler using Microsoft Excel with formatting, summation and autofill features.
09	To Install and configure a software application on a computer system.
10	Explore and apply the various features of Microsoft PowerPoint for creating a professional and interactive presentation.
11	Learn Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email.
12	To understand and practice the use of a web browser such as Google Chrome or MozillaFirefox for accessing websites, searching information, navigating web pages, and using online services effectively
13	To study and use ChatGPT for generating content such as stories, reports, and summaries. To understand how AI tools improve productivity and assist in creative and academic tasks.

Note:

1. Conduct 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)practicalMarks,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.

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G. L. Gite

S. B. Borkar
S. B. Borkar

S. R. Gopandhan
S. R. Gopandhan

M. Gijhaye
M. Gijhaye

M. S. M. Chandhori
M. S. M. Chandhori

Nitin Thakre
Nitin Thakre



Sanmarg Shikshan Sanstha's
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AN AUTONOMOUS INSTITUTE
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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 V. Umale
Bos. Chairperson

Dr. N. G. Hawale

Dr. P. S. Laxman
Dr. A. C. J.

Dr. P. 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, Dhanpat 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.

[Handwritten signatures and names]

[Signature]
V. Umale
Digital B.O.S. chairperson

[Signature]
Dr. P. Agarkar

[Signature]
Dr. N. G. Navale

[Signature]
Dr. P. S. Lomjany
Dean (Acad)



Sanmarg Shikshan Sanstha's
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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.

SRPCE

Version-01(2026-27)

Page 1

Dr. Shital V. Sonale
BOS, Chem. Engg.

Dr. N. G. Hawale

Dr. P. S. Laxman
Dem. Acad.

Dr. P. Agarkar

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. P. S. L. Anjekar
Dr. N. A. Sawale

Dr. P. S. L. Anjekar
Dr. (A.A.)

Dr. P. Agarkar

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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. ARTIFICIAL INTELLIGENCE & DATA SCIENCE

Course Category	Vocational & Skill Enhancement Course -VSEC-I		
Sem:I	Total Hours Distribution per week		
Total Credit:02	Practical (P): 04 Hrs	Tutorial/Activity(T/A): 0Hr.	
Subject Code	BT1AD06P	Web Design Technology Lab	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	Semester End Exam(SEE) Marks	Minimum Passing Marks	Examination Duration
50	50	50	---

Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	Acquire a clear understanding of Internet basics and the key concepts used in web design.
CO2	Build basic websites with a clear structure using HTML and CSS.
CO3	Develop dynamic web pages by implementing JavaScript objects, along with event handling techniques for form validation and interactivity
CO4	Build modern, interactive web application and deploy them efficiently to a live environment.
CO5	Apply Saas to write modular, acalable, and maintainable CSS, utilizing advanced features like variables, nesting and mixins for enhanced styling flexibility.

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Dr. M. chaudhary

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M. Ghhe

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H. H. Thakre

SYLLABUS	
Contents	No. of hours
UNIT I: HTML (Hypertext Markup Language) CSS(Cascading Style Sheets) Basic of HTML, Text formatting, Forms and Input Element, Introduction to CSS, Selector and Properties, Layout and position, CSS Box Model. 1. To create a basic web page using HTML that demonstrates the use of basic HTML structure, headings, text formatting, semantic elements, lists, and hyperlinks. 2. To design a web page using HTML that includes forms and input elements along with proper use of headings and structured layout. 3. To design a structured web page layout using CSS that demonstrates layout techniques, positioning, and the CSS box model for proper spacing and alignment.	10
UNIT II: Responsive Web Design Media Queries, Fluid Layouts, Flexbox and Grid Layout, Mobile-First Design. 1. To design a responsive web page using media queries and fluid layouts to ensure proper display on different screen sizes. 2. To create a webpage layout using CSS Flexbox and Grid for effective alignment, spacing, and structured design. 3. To develop a responsive website using a mobile-first design approach, integrating media queries, fluid layouts, and modern layout techniques for improved user experience across	10
UNIT III: Images and Multimedia Image Formats and Optimization, Working with Images in HTML and CSS, Embedding Audio and Video, Animations and Interactive Media 1. To create a web page that demonstrates the use of different image formats and techniques for image optimization in HTML. 2. To create a web page that demonstrates the use of different image formats and techniques for image optimization in HTML. 3. To develop a multimedia web page that includes embedding audio and video, along with basic animations and interactive media using HTML and CSS.	10
UNIT IV: Web Accessibility Accessibility Principles and Guidelines, ARIA Roles and Attributes, Testing for Accessibility, Designing for All Users. 1. To design a web page following accessibility principles and guidelines, ensuring content is usable for all users. 2. To implement ARIA roles and attributes in a web page to improve accessibility for assistive technologies. 3. To test and enhance a web page for accessibility by applying accessibility testing methods and designing for all users.	12
UNIT V: Web Development Tools and Advanced Topics Text Editors and Integrated Development Environments (IDEs), Version Control with Git and GitHub, Browser Developer Tools, Debugging and Testing, Frameworks and Libraries, CSS Preprocessors (e.g., Sass), JavaScript Basics, Introduction to Content Management Systems (CMS), Web Hosting and Deployment 1. To explore and use text editors and IDEs, along with browser developer tools, for writing, debugging, and testing web applications. 2. To Study GIT and GITHUB. 3. To study about JavaScript.	10

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Session:2026-27

MS
Dr. M. Chaudhari

BOS:- AIDS Version:-1

M. Rajkhije

V. V. V.
V. V. V.

Shaker
Nitin Thakre

W.e.f:-01/July/2026

Note: Create One Website After All Practicals Performed. (compulsory to All)

1. Create Ecommerce website
2. Create statics and dynamics website
3. Create user personal information website

References

Referance Book Recommended:

- 1.HTML & CSS: Design and Build WebsitesWritten by author Jon Duckett
- 2.HTML& CSS: The Complete Reference Authored by Thomas A.
- 3.Responsive Web Design with HTML5 and CSS Authored by Ben Frain
- 4.Learning Web Design: A Beginner's Guide Written by Jennifer Robbins,

Text Books Recommended:

1. "HTML AND XML FOR BEGINNERS" –Mirrison M. , Presentice Hall Of India-Publication
2. "DYNAMIC HTML IN ACTION WEB TECHNOLOGY"-Schurman E. M. ,Presentice Hall Of India-Publication
- 3."HTML and CSS: Design and Build Websites" – *Jon Duckett*, Wiley Publication

URL:

1. <https://www.w3schools.com>
2. <https://www.flux-academy.com/free-resources>
3. <https://wordpress.com/website-builder/>

ghe
G.L. Gisle

MS
Dr. m. chandhavi

~~M. Graybiere~~

~~① Bengard~~
Vaidh Bengard

Thakre
Hirin Thakre

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

An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

B. Tech. Artificial Intelligence & Data Science (NEP) (CBCS)

Sem-I	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L): 2Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT1AD07T	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. |

DR. AMOL MISHRA

*DR. S. K. V. ...
05/08/2026
DR. D. P. Shandekar
05/08/2026
DR. M. S. Palani
05/08/2026*

*Dr. Moumuni Acharya
5/8/2026*

*DR. SUPRIYO DEB
5/8/2026*

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, <u>Voice</u> : 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.er. A.K. Jain ,Dr. Pravin S.R. Bhatia Dr. A. M. Sheikh. S. Chand & Company Ltd.
- 3) Functional English. Dr. M. Sabir. Das GanuPrakashan,
- 4) Functional English For Technical Students. Dr. PratibhaMahato, Dr.Dora. Thompson. Himalaya Publishing House.

DR. AMOL MURARE

09/08/2026
Dr. S. K. Sharma
Dr. D. P. Shastri
05/08/2026
Dr. S. Palani
05/08/2026

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(Dr. Moumuni Ach)
5/8/2026

5/8/2026
(Sukiy. Khan)

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

An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

B. Tech. Artificial Intelligence and Data Science (NEP) (CBCS)

Sem-I	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L) :	Tutorial/Activity (T/A) : 4Hrs	
Subject Code	BT1AD08P	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

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

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

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

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

M. S. Paley
M. S. Paley
05/08/2026

Dr. S. Kher
05/08/2026
Dr. D. P. Shastri
05/08/2026

Sendesh R. Gadhane
Sendesh R. Gadhane

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

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Faculty of Science & Technology

B.Tech. Artificial Intelligence & Data Science (NEP) (CBCS)

Sem-II	Total Hours Distribution Per Week		
Total Credits : 3	Lecture (L) : 3 Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2AD01T	Probability and Statistics	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
40 Marks	60 Marks	50	3 Hours

Course Objectives

1	The aim is the process of managing the random events including the collection of data, its analysis and interpretation.
2	The topic covered enhances the analytical thinking power of the students dealing with the real life problems.

Course Outcomes

After completion of syllabus, students would be able to

1	Analyze the concept of Discrete and Continuous random variable, conditional probability and able to solve the problems of Probability.
2	Apply the concept of probability to analyze the various parameters of probability.
3	To understand the types of Probability distributions applying to solve the particular problems.
4	To solve the various types of problems having statistical data.
5	To solve the problems having statistical data and analyze the various parameters.

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05/08/2026
Dr. Yashu (over)

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05/08/2026
D. F. Shastri
(D. F. Shastri)

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Mrs. M. S. Patil
05/08/2026

SYLLABUS

SYLLABUS			
Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit 1: Theory of Probability			
Axioms of Probability, Conditional Probability, Baye's theorem and its examples, Review of Discrete and Continuous random variables, Joint distribution, Independent random variables, Conditional Distributions.	7		1
Unit 2: Mathematical Expectations			
Mathematical Expectations, Variance and Standard Deviation. Moments, Moment generating function, Moments about origin and about mean, measure of Skewness and Kurtosis. Conditional Expectations, Covariance and Correlation Coefficient.	8		2
Unit 3: Probability Distributions			
Binomial distribution, Poisson's distribution, Normal distribution, Uniform distribution and Exponential distribution.	7		3
Unit 4: Statistical Techniques-I			
Introduction to Correlation and Regression, Multiple correlation and its properties, Multiple regression analysis, Regression equations of three variables. Measures of central tendency: Mean Median, Quartile, Decile, Percentile and Mode.	8		4
Unit-5: Statistical Techniques-II			
Measures of Dispersion: Range, Quartile deviation, Mean deviation, Variance, Standard deviation. Coefficient of dispersion. Skewness: Tests and uses of skewness and types of distributions, Measures of skewness, Karl Pearson's coefficient of skewness, Measure of skewness based on moments.	6		5

Text/Reference Books:

- Text/Reference Books:**
- (1) Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
 - (2) Probability and Statistics (Schaum's Outline Series), Murray Spiegel, Jhon Schiler, R.A.Srinivasan.
 - (3) N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Eight edition 2011.
 - (4) B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010. ncy
 - (5) Probability, Statistics and Random Process (TMH), T. Veerarajan. P. N. Wartikar and J. N. Wartikar, Applied Mathematics, Volume I and II.
 - (6) H.K Dass Advanced Engineering Mathematics Reprint 2016, S. Chand.

05/08/2026
(Dr. Yusuf Olunzi)

05/08/2026
Dr. S. Khan
Dr. D. F. Shastri
05/08/2026

Ms. M. S. Palani
05/08/2026

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

B.Tech. Artificial Intelligence & Data Science (NEP)(CBCS)

Sem-II	Total Hours Distribution Per Week		
Total Credits : 1	Practical (P) : 2 Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2AD01P	Probability and Statistics 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 Theory of Probability.
- 2 Problems on the Mathematical Expectations.
- 3 Problems on Probability Distributions.
- 4 Problems on Statistical Techniques-I
- 5 Problems on Statistical Techniques-II

Sr. No.	List of the Practical: Performance of at least SIX practical is compulsory in a semester.
Unit-1: Theory of Probability (6 Hours)	
1	Write a Program to solve examples on Bayes theorem.
2	Write a Program to solve the examples on Joint Distribution.
Unit 2: Mathematical Expectations (04 Hours)	
3	Write a Program to solve the problem on Mathematical Expectations.
4	Write a Program to solve the problems on Moment generating function.
5	Write a Program to find the Covariance and Correlation Coefficient.
Unit 3: Probability Distributions (05 Hours)	
6	Write a Program to solve problems on Binomial distribution and Poisson's distribution.
7	Write a Program to solve problems on Normal distribution.
8	Write a Program to solve problems on Uniform distribution and Exponential distribution.
Unit-4 Statistical Techniques-I (04 Hours)	
9	Write a Program to solve the Problems on Correlation and Regression.
10	Write a Program to solve the Problems on Measures of central tendency.
Unit-5: Statistical Techniques-II (05 Hours)	
11	Write a Program to solve the problem on Measures of Dispersion.
12	Write a Program to solve the problem on Measures of Skewness.

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An Autonomous Institute Affiliated to RTMNU, Nagpur
Faculty of Science & Technology
**B. Tech. Second Semester Artificial Intelligence & Data Science 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	BT2AD02T	Applied 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 Optical Fibre used for advanced applications in Engineering
3	To familiarize prospective engineers with fundamental concepts of semi-conductors and their applications in semiconductor technology
4	To gain an understanding of the total internal reflection in electron optical system
5	To make acquainted with the Nano technology

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 optical fibre 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 Motion Of Electron in Various Electrical Devices.
5	Learn Various types of Nonmaterial and their different types.

Contd.

Yas
05/08/2020
Dr. C.L. Khobragad

Praveen
05/08/2020
Mrs M. S. Paley

Dr. S. V. Khar
05/08/2020
Dr. S. V. Khar

Dr. S. V. Khar
05/08/2020
Sanket Lande

SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1 Quantum Mechanics & Quantum Computing			
De-Broglie Hypothesis, Concept of wave-particle duality, Matter Waves, Davisson-Germer Experiment. 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, Introduction about Quantum Computer, Explain Bit & Qubits, Quantum Entanglement, & Numerical	7		1
Unit 2: Optical Fibre			
Structure of optical fiber, total internal reflection, modes of propagation, Classification of Fibre, Graded index profile, Single Mode and Multi Mode Numerical aperture, classification of optical fiber, Acceptance angle and cone, attenuation and dispersion, fiber optic communication system. & Numerical.	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: Electron optics			
Motion of electron in magnetic and electric field, Bethe's law, Electrostatic lens, CRT : Block diagram and functions of each part of CRT. CRO: Block diagram and functions of each part like trigger circuit and time base circuit. Applications of CRO	7		4
Unit 5: Nanotechnology			
Basic Concept of nanotechnology, Classification of Nano Materials, Comparison Of Properties Of Nonmaterial's With Bulk Materials Top-down and bottom-up approach, comparison of properties of bulk and nano-materials, sol gel process and ball mill process, special types of materials, Zeolite and Graphene, applications of nanotechnology.	7		5

Contd.

Dr. C. L. Chitambar
05/08/2026

Dr. D. F. Shandekar
05/08/2026

Dr. S. Khoo
05/08/2026

Dr. Ashutosh Raut
05/08/2026

Sanjay Lambe
05/08/2026

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. Bhounik, 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.ShrutiPatle, 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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Dr. C.L. Khobragade
05/08/2026

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(Dr. S. V. Khosla)
05/08/2026

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Dr. D. F. Shastri
05/08/2026

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Ashutosh Raut
05/08/2026

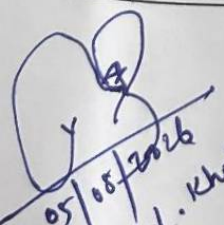
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Sanket Londe
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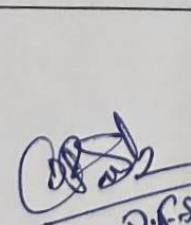
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UMRER ROAD, NAGPUR
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Faculty of Science & Technology
B.Tech. Second Semester Artificial Intelligence & Data Science Engineering
(NEP)(CBCS)(Practical)

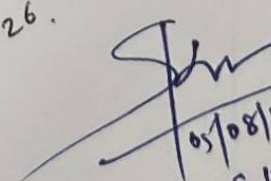
Sem-II	Total Hours Distribution Per Week		
Total Credits :1	Lecture (L) : 0Hrs	Tutorial/Activity (T/A) : 2 Hrs	
Subject Code	BT2AD02P	Applied Physics Lab	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
25 Marks	25 Marks	25	3 Hours

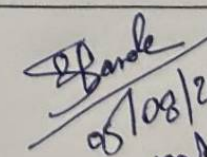
List of Experiments: Performance of at least eight experiments is compulsory in a semester.

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.
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.


05/08/2026
Dr. C.L. Khobragade


ms.m.s. fabel
5/8/26.
Dr. D.P. Shastri
05/08/2026.


05/08/2026.
Dr. S. Ichem.


05/08/2026
Sanjay Kande.

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. ARTIFICIAL INTELLIGENCE

& DATA SCIENCE

Course Category	Engineering Science Course - ESC -IV		
Sem:II	Total Hours Distribution per week		
Total Credit: 03	Lecture (L): 03 Hrs	Tutorial/Activity(T/A): ----- Hr.	
Subject Code:	BT2AD03T	Python programming language	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	Semester End Exam(SEE) Marks	Minimum Passing Marks	Examination Duration
40	60	50	03 Hrs

Course Objectives

1	Acquire essential knowledge of Python programming and its core features.
2	Equip students with the knowledge and skills required to write, debug, and maintain Python programs for real-world applications and problem-solving.
3	Enable the students to develop the applications using the concepts of Python.

Course Outcomes

After successful completion of this course the student will be able to:	
CO1	Apply Python programming concepts to develop solutions for computational problems.
CO2	Develop Python programs using variables, data types, operators, control statements, and functions.
CO3	Implement Python programs using built-in data structures such as lists, tuples, dictionaries, and sets.
CO4	Implement object-oriented programming concepts, exception handling, and file handling to develop robust Python applications.
CO5	Develop Python-based solutions to solve real-world computational problems using appropriate Object Oriented concepts.

ghbe
G.L. Girdle

Pr. M. Chandhari
M. Chhajjhiye

V. B. Bhoirane
Vishnu Bhoirane
Shakre
Hitesh Thakre

SYLLABUS		Mapped with CO Numbers
Contents	No. of hours	
Unit I : Introduction To Python Importance of Python, Installing Python in Windows & Ubuntu, Executing Python programs, Comments in Python, Indentation in Python, Python character set, Tokens, Python Core Data Types, The print () function, Assignment of values to variables, The input() function. Operators, (arithmetic operator, relational operator, Boolean operator, assignment.	10	CO1
Unit II : Control Statements And Functions Decision making statements; if, if else and nested if else. Loop Control Statements: for loop ,while loop, range() function ,break statement, continue statement, pass statement. Functions- Syntax , Use of a function, Parameters and arguments in a function, Recursive functions, lambda function.	08	CO2
Unit III : Lists ,Tuples And Sets Lists-Creating Lists, Accessing the elements of a List, List slicing, Python in-built functions for lists, List Methods, Passing list to a function, Returning a list to function. Tuples - Creating tuples, tuple() function, Inbuilt functions for tuples, Indexing and Slicing, Operations on tuples, Passing variable length arguments to tuples, Sort tuples, Traverse tuples from a list, The zip() function, The Inverse zip(*) function; Sets - Creating sets, The Python Set Class, Set operations.	08	CO3
Unit IV : Dictionaries , String And File Handling Dictionaries- Basics of Dictionaries, Creating a Dictionary, Adding and replacing values, Retrieving values, Formatting dictionaries, Deleting items, Comparing two dictionaries, Methods of dictionary class, Traversing dictionaries, Nested dictionaries, Strings- Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings. File Handling -Text files, Reading and Writing files, Writing numbers to a file, Reading Text, Reading numbers from a file, seek() function.	08	CO4
Unit V : Oops Concepts Introduction to OOP- Procedural vs Object-Oriented Programming features of oops, Advantages of OOP ,Classes and Objects -Creating classes and objects, Class attributes and instance attributes.	10	CO5

G.L. Girdle

Dr. M. Chaudhary

M. G. Girdle

Vishal Kargu

Hitesh Thakre

References Books Recommended:

1. Gowrishankar S, Veena A, "Introduction to Python Programming", 1st Edition, CRC Press/Taylor & Francis, 2018. ISBN-13: 978-0815394372
2. Reema Thareja "Python Programming" 2nd Edition.
3. Mark Summerfield ."Programming In Python 3" , 2nd Edition
4. Kamthane, A. N., &Kamthane, A.A. (2017) Programming and Problem Solving with Python, McGraw Hill Education.

URL:

1. <https://www.w3schools.com>
2. <https://www.learnpython.org/>
3. <https://www.python.org/about/gettingstarted/>

ghe
G.L. Girdle

MS
Dr. m. chaudhary

m. ghuge
m. Ghughe

Vaibhav
Vaibhav Baopad
Thakre
Nitin Thakre

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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. ARTIFICIAL INTELLIGENCE & DATA SCIENCE

Course Category	Engineering Science Course - ESC -IV		
Sem:II	Total Hours Distribution per week		
Total Credit:1	Practical (P): 02 Hrs	Tutorial/Activity(T/A):	
Subject Code:	BT2AD03P	Python Programming Language Lab	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	Semester End Exam(SEE) Marks	Minimum Passing Marks	Examination Duration
25	25	25	

Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	Demonstrate the installation, configuration, and execution of Python programs using an appropriate Python IDE.
CO2	Develop Python programs using variables, operators, decision-making statements, and looping constructs to solve basic computational and mathematical problems.
CO3	Apply Python data structures and string manipulation techniques to perform data processing and problem-solving tasks..
CO4	Implement recursive functions and file handling operations to develop efficient Python applications.
CO5	Design simple object-oriented Python programs using classes and objects to solve real-world problems.

List of Practical's

Following practical's shall be performed:

Sr. No.	List of Practical's
01	To study python programming and install python IDE in windows.
02	Construct a program to find out the total marks in average and calculate percentage of a student.
03	Find a Largest of Three Numbers in python Using Nested if Else.
04	Construct a program calculate total cost of item in shopping cart with discount based on the total amount.
05	Implement a program to check whether a number is a palindrome.

06	Create a list of student marks and perform insertion, deletion, updating, and sorting.
07	Construct a program to count vowels and consonants in a string.
08	Develop a program to reverse a string.
09	Implement a recursive function to calculate the factorial of a number.
10	Develop a program to copy the contents of one file to another.
11	Construct a program to find area and perimeter of rectangle using class and object.
12	Implement a Program to merge two text files into a third file.

Note:

1. Conduct 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.

Ghbe
G. Girdle

MS
Dr. M. Chaudhary

M. G. Ghuge
M. G. Ghuge

Vaibhav Rayale
Hitin Thakre



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

NAAC ACCREDITED

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

FACULTY OF SCIENCE & TECHNOLOGY

DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION ENGINEERING

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

Course Category:	Engineering Science Course (ESC-V)		
Semester: II	Total Hours Distribution per week		
Total Credit: 02	Lecture (L): 2 Hrs.	Tutorial (T): 0 Hr.	
Subject Code & Subject Name:	BT2CE04T / BT2AD04T/ BT2CS04T	Principle of Digital Electronics	
EXAMINATION SCHEME			
Continuous Internal Evaluation (CIE)Marks	End Semester Examination (ESE) Marks	Minimum Passing Marks	Examination Duration
20	30	25	2 Hours

COURSE OBJECTIVES:

1. To discuss the fundamentals of digital systems, number systems, and signed number representation used in digital electronics.
2. To develop an understanding of Boolean algebra, logic gates, and logic simplification techniques for digital circuit design.
3. To justify knowledge of the design and analysis of combinational logic circuits using standard digital building blocks.
4. To discuss memory elements and sequential logic circuits used in digital system design.

COURSE OUTCOMES:

1. Apply number system conversions and signed number representations to solve digital arithmetic problems.
2. Implement Boolean expressions and design minimized logic functions using Boolean algebra and Karnaugh maps.
3. Design and analyze combinational logic circuits using adders, subtractors, multiplexers, decoders, encoders, and code converters.
4. Analyze and design sequential logic circuits using latches, flip-flops, registers, and counters.

Dr. Shital V. Umale
BAS, Chairperson
Dr. Anurag Pawar

Version-01(2026-27)

Dr. N. G. Hanole

Page 1

Dr. P. Agarkar

SYLLABUS

Unit I: Digital Systems and Number Systems: (08 Hours)

Introduction to Digital Systems, Analog vs. Digital Systems
Number Systems: Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number System, Number System Conversions, Signed Number Representation: 1's Complement, 2's Complement.

Unit II: Boolean Algebra and Logic Simplification: (08 Hours)

Basic Logic Gates: AND, OR, NOT Gates, Universal Gates: NAND and NOR
Boolean Algebra, Boolean Identities and Theorems, De Morgan's Theorems,
Canonical Forms: Sum of Products (SOP), Product of Sums (POS)
Logic Function Minimization using Karnaugh Maps (2, 3, and 4 Variables)
Don't Care Conditions.

Unit III: Combinational Logic Circuits: (08 Hours)

Design of Combinational Logic Circuits-Half Adder, Full Adder Half Subtractor, Full Subtractor, Multiplexers and Demultiplexers, Encoders and Priority Encoders
Decoders, Code Converters.

Unit IV: Sequential Logic Circuits: (08 Hours)

Introduction to Sequential Circuits, Latches: SR Latch, D Latch
Flip-Flops: SR, JK, D, and T Flip-Flops, Characteristic Tables Excitation Tables,
Flip-Flop Conversions. Registers: Shift Registers (SISO, SIPO, PISO, PIPO)
Counters: Asynchronous (Ripple) Counters, Synchronous Counters, Mod-N Counters.

Text Books:

1. Morris Mano, 'Digital Electronics' 6th Edition, Pearson Education.
2. Anand Kumar, 'Fundamentals of Digital Circuits' 4th Edition, PHI Learning Pvt. Ltd.
3. R.P. Jain, 'Modern Digital Electronics' 4th Edition, McGraw-Hill Education (India)
4. Anil K. Maini, 'Digital Electronics Principles: Devices and Applications, Wiley India, 2007.

Reference Books:

1. Thomas L. Floyd, 'Digital Fundamentals' 11th Edition (2015), Pearson Education.
2. Brian Holdsworth 'Digital Logic Design', 4th Edition, Newness Publication.

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UNIVERSITY, NAGPUR
FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. ARTIFICIAL INTELLIGENCE & DATA
SCIENCE

SCIENCE

Course Category	Program Core Course -PCC-I		
Sem:II	Total Hours Distribution per week		
Total Credit: 02	Lecture (L): 02 Hrs	Tutorial/Activity(T/A): 00Hrs.	
Subject Code:	BT2AD05T(Th)	Computer Architecture And Organization	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	Semester End Exam(SSE) Marks	Minimum Passing Marks	Examination Duration
20	30	25	02 Hours

Course Objectives

1	Enhance the knowledge of computer, instructions, handling data, performing ALU operations in Hardware, memory optimization of system behavior and understand the awareness in role of operating system.
2	To develop and enhance the skill in hardware and I/ O operations.

Course Outcomes

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

CO1	Interpret Register Transfer Language (RTL) statements to analyze the execution of basic computer instructions and data transfer operations ,addressing mode
CO2	Analyze data representation techniques, instruction sets, and computer arithmetic algorithms, including integer and floating-point operations, arithmetic circuits, multiplication, and division techniques, to explain data processing in computer systems.
CO3	Illustrate memory organization concepts, including memory hierarchy, cache memory organization, mapping techniques, replacement algorithms, and write policies to analyze and improve memory access performance in computer systems.
CO4	Apply concepts of input-output organization, I/O transfer methods, interrupt handling, instruction privileges, and process state transitions to analyze peripheral device communication and system performance.

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Dr. J. K. Kulkarni
Vishal Kulkarni

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SYLLABUS		
Contents	No. Of Hours	Mapped with CO
Unit I: Basic Structure of Computers: Basic Functional blocks of a computer, CPU, Memory, Input-Output subsystems, control unit. Instruction set architecture of CPU, registers, instruction execution cycle, RTL Interpretation of instruction, addressing modes.	06	CO-1
Unit II: Data Representation : Signed number, Fixed and floating point and character representation, addressing modes, Instruction set, Computer arithmetic-integer addition, subtraction, multiplication, shift and add, ripple carry adder, look-ahead carry adder, Floating point arithmetic, Booth's multiplier, carry save multiplier, Division- Restoring and Non Restoring techniques.	08	CO-2
Unit III: Memory Organization: Concept of Memory hierarchy and Memory Interleaving, Cache memory (mapping techniques: direct, associative, set-associative) Cache size vs Block size, Mapping functions Replacement Algorithm, Write Policy.	07	CO-3
Unit IV: Peripheral Devices: Input-Output subsystems, Characteristic, I/O Transfers program Controlled , DMA and Interrupt driven Privileged and Non Privileged Instructions, Software interrupts and Exceptions, Programs and process (role of interrupts in process state transition)	07	CO-4

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W. K. Singh
W. K. Singh

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Hitin Thakur

References Book Recommended:

1. **Computer Organization and Architecture:** by William Stallings, First Edition Published in 1987.
2. **Computer Organization and Design:** by David A. Patterson, John L. Hennessy, First Edition Published in 1993.
3. **Computer System Architecture:** by Morris Mano, Published October 19th 1992 by Prentice Hall.
4. **Structured Computer Organization:** by Andrew S. Tanenbaum, Published July 25th 2012, Todd Austin

Text Book Recommended:

1. **Computer Organization and Design:** (RISC-V edition): The Hardware/Software Interface (RISC-V edition) by Patterson and Hennessy.
2. **Computer Architecture:** A Quantitative Approach by John L. Hennessy.

E-Book Recommended:

1. **Computer Architecture And Organization:**

<https://os.ecci.ucr.ac.cr/ci0114/material/Stallings/Computer-Organization-Architecture-11th.pdf>.

2. **Computer System Architecture:**

<https://www.mbit.edu.in/wp-content/uploads/2020/05/computer-systems-Architecture.pdf>

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V. Jayaram
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Hirish Thakre

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Faculty of Science & Technology

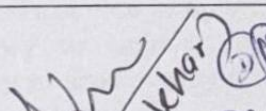
B. Tech. Artificial Intelligence and Data Science(NEP)(CBCS)

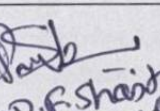
Sem-II	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L): 2Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2AD06T	REFER TO IKS (Glimpse of Ancient Science & Technology)	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
20 Marks	30Marks	25 Marks	2 Hours

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.


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Dr. D. R. Shinde
05/08/2026


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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, Anshikaparakashnpratapgarh ,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.

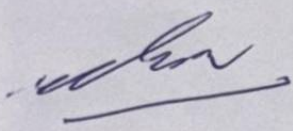
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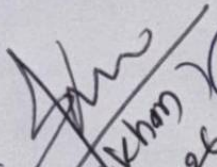
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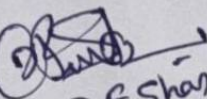
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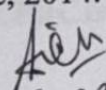
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8. S Biswal, B L Ray, Vedic Science and Technology, DK Porint world, 2009.
9. A. K. Bag, History of technology in India, (Set 3 vol), Indian Nation Science Academy, 1997.
10. A Gosh, History of Science in India (Volume-I Part-II Astronomy), the national academy of science, India & the Ramakrishna mission institute of culture, 2014.


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Faculty of Science & Technology

B. Tech. Artificial Intelligence and Data Science(NEP)(CBCS)

Sem-II	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L): 2Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2AD06T	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.

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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.

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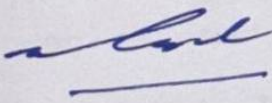
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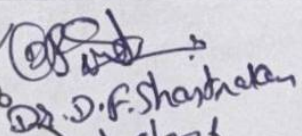
B. Tech. Artificial Intelligence and Data Science(NEP)(CBCS)

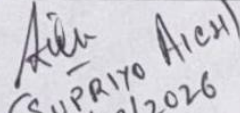
Sem-II	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L): 2Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2AD06T	REFER TO IKS (Preserving Art, Culture and Traditions)	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
20 Marks	30 Marks	25 Marks	2 Hours

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.


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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.

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Faculty of Science & Technology

B. Tech. Artificial Intelligence and Data Science (NEP) (CBCS)

Sem-II	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L): 2Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2AD06T	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. |

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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

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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. ARTIFICIAL INTELLIGENCE & DATA SCIENCE

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):	
Subject Code:	BT2AD07P	Linux &Shell Programming Lab	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	Semester End Exam(SEE) Marks	Minimum Passing Marks	Examination Duration
50	50	50	

Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	Discuss the fundamental concepts of the operating system and linux operating system.
CO2	Develop proficiency in using Linux terminal commands and utilities.
CO3	Enable students to write and execute shell scripts using Bash.
CO4	Design and implement automation solutions using shell scripting to perform routine Linux system administration tasks.
CO5	Configure and manage basic Linux services such as Apache, Mail, and FTP servers for system administration applications.

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SYLLABUS	
Contents	No. of hours
Unit I: Linux and Different Types Of Operating Systems: Introduction to Operating Systems, Types of OS : Windows, Linux, Mac OS, DOS ,History of Linux, Linux Architecture, Linux Distributions, Linux Installation Steps. Practical List : 1. Study and compare different operating system(Window, Linux , Mac OS, DOS, and Android) based on features, architecture, licensing and applications. 2. Explore the Linux boot process and verify basic system information such as kernel version, hostname, logged-in user, and operating system details. 3. Part A :Install Ubuntu Linux on a virtual machine (Virtual Box/VMware) or a physical system and explore the Linux desktop environment. 4. Part B :Install Ubuntu Linux on a virtual machine (Virtual Box/VMware) or a physical system and explore the Linux desktop environment. 5. Verify and explore the installed Linux system, including its desktop environment, terminal, file system, and basic system configuration.	12
Unit II: Linux Terminal and Commands : Introduction to Terminal File Commands : ls, cd, pwd, head, tail, touch ,rm, cp, cat, more, chmod, dir Process Management : ps, top, kill, bg, fg. System Information: date, cal, uptime, whoami, df, man free, clear .Network Commands : ping, whois, dig. Shortcut Keys: Ctrl+C, Ctrl+Z, Ctrl+D, Ctrl+W, Ctrl+U Practical List : 1. To study the Linux Terminal and understand the basic structure and execution of commands. 2. Access the Linux operating system and execute basic terminal commands to retrieve user, system, and directory information. 3. Create, view, copy, rename, and delete files and directories using Linux file management commands. 4. Study process management by executing commands such as ps, top, bg, fg, and kill.	14
Unit III: Introduction To Shell Programming : Shell basics, types of shell, shell script, Variables and environment variables, Conditional statements(if, if-else), Loops(for, while,), Functions in shell scripts, Command-line arguments Writing and executing shells scripts. Practical List : 1. Identify different types of Linux shells and write, save, and execute a simple shell script. 2. Illustrate and execute a basic shell script using variables . 3. Write a shell script to calculate the factorial of a given number using a for loop. 4. Write a shell script using functions to perform arithmetic operations (addition, subtraction, multiplication, and division). 5. Write a shell script to generate the Fibonacci series.	14

Shell and Shell Scripts, Linux Sessions, Standard Streams, Input/Output Redirection
Pipes and Tee Command, Command Execution, Command-Line Editing, Quotes and Command
Substitution, Job Control, Aliases and Variables, Environment Customization
Introduction to: Apache Server, Mail Server, FTP Server.

Practical List :

1. Study Linux sessions, standard streams (stdin, stdout, stderr), and perform input/output redirection.
2. Study the installation and basic configuration of Mail Server and FTP Server services in Linux.
3. Write a shell script using pipes and the `tee` command.
4. Study the basic concepts of a **Mail Server** and understand the process of sending and receiving email in a Linux environment.
5. Study the basic concepts and working of an **FTP Server** and perform file transfer between a client and server.

Case study: Create Linux control panel using Ubuntu Linux virtual machine (Virtual Box/VMware) system and explore the Linux desktop environment.

1. "Operating Systems Linux" NIIT, Prentice Hall of India.
2. "Linux Kernel Development " Robert Love, 3rd Edition.
3. "Ubuntu Linux Toolbox"Christopher Negus ,2nd Edition.
4. "The Linux Programming Interface – A Linux and UNIX System Programming Handbook" by Michael Kerrisk
5. "Linux Command Line and Shell Scripting Bible" by Richard Blum and Christine Bresnahan

1. <https://www.w3schools.com>
2. <https://www.geeksforgeeks.org/linux>
3. <https://www.tutorialspoint.com>

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SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING NAGPUR

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FACULTY OF SCIENCE & TECHNOLOGY

B.TECH. ARTIFICIAL INTELLIGENCE & DATA SCIENCE

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):	
Subject Code:	BT2AD07P	Digital Marketing Lab	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	Semester End Exam(SEE) Marks	Minimum Passing Marks	Examination Duration
50	50	50	

Course Objective

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

CO1	Understand the fundamentals of digital marketing, online platforms, and digital business strategies.
CO2	Develop practical skills in creating digital content, social media campaigns, websites, and online advertisements using modern digital tools.
CO3	Analyze digital marketing performance using SEO, analytics, email marketing, and AI-based marketing tools to improve business growth.

Course Outcomes

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

CO1	Explain the concepts and importance of digital marketing and various online marketing channels.
CO2	Create and optimize websites, blogs, and social media pages for digital promotion..
CO3	Apply SEO, content marketing, and email marketing techniques to improve online visibility.
CO4	Design and execute digital advertising campaigns using Google Ads and social media platforms.
CO5	Analyze marketing performance using Google Analytics and AI tools to make data-driven marketing decisions.

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M. Chitambar

Dr. S. S. Sengupta
Dr. S. S. Sengupta

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Hitin Thakre

SYLLABUS

Contents	No. of hours
Unit I Introduction to Digital Marketing Topics : Fundamentals of Digital Marketing ,Traditional Marketing vs Digital Marketing 'Digital Marketing Ecosystem ,Digital Customer Journey ,Types of Digital Marketing ,Digital Marketing Channels ,Creating Google Account ,Creating Business Gmail ,Introduction to Canva , Digital Ethics and Cyber Security Practical List : 1. Create a professional Gmail account for business. 2. Part A: Design a digital poster using Canva . 3. Part B: Design a digital poster using Canva . 4. Create a Google Business Profile (Demo). 5. Compare traditional marketing with digital marketing using PowerPoint.	10
Unit II: Website Development & Social Media Marketing Topics: Introduction to Websites ,Domain and Hosting,Website Builders ,Google Sites, WordPress Basics, Blogging,Social Media Platforms ,Facebook Business Page, Instagram Business Account ,LinkedIn Company Page . Practical List : 1. Create a personal website using Google Sites. 2. Part A: Create a blog using Blogger or WordPress. 3. Part B: Create a blog using Blogger or WordPress. 4. Create a Facebook Business Page. 5. Create an Instagram Business Profile and prepare five promotional posts.	10
Unit III: Search Engine Optimization (SEO) & Content Marketing Topics: Introduction to SEO ,On-page SEO ,Off-page SEO ,Keyword Research,Google Search Console ,Content Marketing , Blog Writing ,AI Content Writing Tools ,Email Marketing Newsletter Design. Practical List : 1. Perform keyword research using Google Keyword Planner. 2. Write and publish an SEO-friendly blog. 3. Design an email newsletter using Canva. 4. Part A: Create an email marketing campaign using Mailchimp (Free Version). 5. Part B: Create an email marketing campaign using Mailchimp (Free Version).	10
Unit IV: Online Advertising & Digital Campaigns Topics: Google Ads ,Search Ads ,Dsplay Ads , Video Marketing , YouTube Marketing Facebook Ads , Instagram Ads , Influencer Marketing , Affiliate Marketing ,Campaign Budget Planning .	10

Practical List :

1. Create a Google Ads campaign (Demo Mode).
2. Design a Facebook advertisement.
3. Part A: Create a YouTube promotional video.
4. Part B: Create a YouTube promotional video.
5. Prepare a digital marketing campaign for a local business.

Unit V: Analytics, AI & Emerging Trends

Topics: Google Analytics, Website Traffic Analysis , Performance Metrics , ROI, Conversion Rate , AI in Digital Marketing , ChatGPT for Marketing , AI Image Generation , Marketing Automation, Future Trends in Digital Marketing .

Practical List :

1. Analyze website traffic using Google Analytics Demo Account.
2. Generate marketing content using ChatGPT.
3. Create AI-generated promotional images using Canva AI.
4. Part A: Prepare a complete Digital Marketing Report for a product or service.
5. Part B: Prepare a complete Digital Marketing Report for a product or service.
6. Calculate Return on Investment (ROI) for a digital marketing campaign using sample data.

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Suggested Mini Project : Each student (or group of 2 students) should complete **one mini project** by applying the concepts learned during the course.

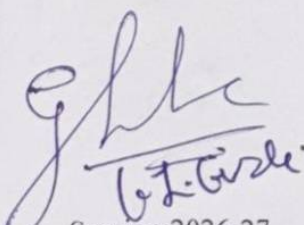
Examples:

- Digital Marketing Campaign for Engineering College
- Social Media Promotion for Local Business
- Product Branding using Canva
- SEO Optimization for College Website
- Online Promotion of Startup Idea

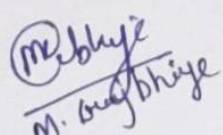
Suggested Software / Tools

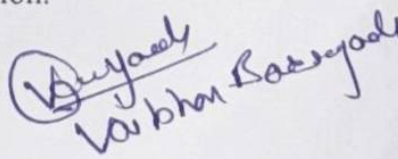
- Google Workspace
- Canva
- Blogger / WordPress
- Google Keyword Planner
- Google Search Console
- Google Analytics
- Google Ads
- ChatGPT
- Canva AI

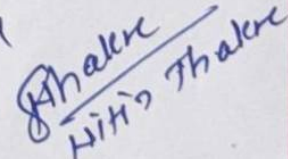
All Are Online Free Vision Tools. Canva AI is Paid version.


J. L. Gade


Dr. M. Chaudhary


M. Bhatnagar


V. Bhatnagar


J. H. Thakre

Reference Books Recommended:

1. Seema Gupta, Digital Marketing, McGraw Hill.
2. Puneet Singh Bhatia, Fundamentals of Digital Marketing, Pearson.
3. Damian Ryan, Understanding Digital Marketing, Kogan Page.
4. Philip Kotler, Marketing 5.0, Wiley.
5. Ian Dodson, The Art of Digital Marketing, Wiley.

URL :

1. <https://www.w3schools.com>
2. <https://www.geeksforgeeks.org/linux>
3. <https://www.tutorialspoint.com>

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G. L. Gisle

MS
Dr. M. chandhaveri

M. Ghule
M. Ghule

V. B. Bhatia
Vaibhav Bhatia

Thakre
Nitin Thakre

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

An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

B. Tech. Artificial Intelligence and Data Science (NEP) (CBCS)

Sem-II	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L) :	Tutorial/Activity (T/A) : 4Hrs	
Subject Code	BT2AD08P	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, Surynamaskar, 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.

(Signature)
Dr. D. F. Shastri
05/08/2026

(Signature)
Sandeep R. Gandhe
05/08/2026