# TULSIRAMJI GAIKWAD-PATIL College of Engineering & Technology

Mohgaon, Wardha Road, Nagpur - 441 108



## Bachelor of Technology NEP - 2020 Scheme Session 2024 - 25 Department of Computer Science and Engineering (Data Science)

#### Vision of Institute:

To emerge as a learning Center of Excellence in the National Ethos in domains of Science, Technology and Management.

#### **Mission of Institute**

- [M1] To strive for rearing standard and stature of the students by practicing high standards of professional ethics, transparency and accountability.
- [M2] To provide facilities and services to meet the challenges of Industry and Society.
- [M3] To facilitate socially responsive research, innovation and Entrepreneurship.
- [M4] To ascertain holistic development of the students and staff members by inculcating.

#### Tulsiramji Gaikwad - Patil College of Engineering and Technology



Wardha Road, Nagpur-441108 NAAC Accredited with A+ Grade

(An Autonomous Institute Affiliated to RTM Nagpur University, Nagpur)



Scheme of Instructions for Second Year of B.Tech.(UG) Programme Data Science(DS)

**Fourth Semester** 

			BoS/					Contac	t Hou	rs		Q	%Wei	ghtage	Total	
SN	Sem	Туре	Dept	Sub. Code	Subject	T/P	L	SL	Р	Hrs	Credits	CT/IA	CA	ESE		
1	4	PCC	DS	BDS32401	Operating System	Т	2	0	0	2	2	14	6	30	50	
2	4	PCC	DS	BDS32402	Theory of Computation	Т	3	0	0	3	3	30	10	60	100	
3	4	PCC	DS	BDS32403	Introduction to Data Science	Т	3	0	0	3	3	30	10	60	100	
4	4	PCC	DS	BDS32404	Operating System -Lab	Р	0	0	2	2	1	-	25	25	50	
5	4	PCC	DS	BDS32405	Introduction to Data Science-Lab	Р	0	0	2	2	1	-	25	25	50	
4	4	MDM	S&H	BSH32402	Mathematics in Data Science	Т	2	0	0	2	2	14	6	30	50	
5	4	OE		B\$\$324XX	OE -II	Т	2	0	0	2	2	14	6	30	50	
6	4	VSEC	DS	BDS32406	DBA (SQL/JDBC)-Lab	Р	0	0	4	4	2	-	50	50	100	
7	4	AEC	S&H	BSH32404	Leadership and Team Dynamics	Р	0	0	4	4	2	-	50	50	100	
8	4	HSSM	MBA	BBA32401	Entrepreneurship Development	Р	0	0	4	4	2	-	50	50	100	
9	4	VEC	S&H	BSH32403	Human Value for Professional Society	Т	2	0	0	2	2	14	6	30	50	
					TOTAL		14	0	16	30	22	116	244	440	800	
-		<b>D</b> <i>a a</i> <b>m</b> <i>a a</i>														

Course Category	BSC/ESC (Basic Science	Р	СС	Multidisc courses	ciplinary		Huma I	nities Soci Manageme	al Science ent	&	Experiential				CC Co- Curriculr
	Course/Engineer ing Science Course.	Programme Core courses(PCC)	Programme Elective Course(PEC)	MDM	Open Elective(OE)	VS EC	AEC( Abilityy	Entreprene urship[Cou rse	IKS(Indian knowledge System)	Value Education Course	Research Methodol ogy	Common Engineering Project(CEP)/Field Projects(FP)	Project	Internsh /OJT	Course( CC)
Credits	-	10	-	2	2	2	2	2	-	2	-	-	-	-	-
Cumul AtiveSum	16/13	20	-	4	6	6	4	4	2	4	-	2	-	-	4

**PROGRESSIVE TOTAL CREDITS: 20+22=42** 

Head of Department CSE - Data Science "Juliaring Galwads" - College of Engineering and Tect	Dean Academics Fulsiramji Gaikwad-Patii Ceilige Of Engineering and Technology. Nager	Vice Pricepar Tuisianiji Volkwoo-Patti Critega of Endheering 8 Technologi, Naopur. 1	Dr. Premanand Naktode Principal TGPCET, Nagpur	Aug,2023	1.00	Applicable for A Y 2023- 24 Onwards
Chairperson	Dean Academics	Vice Principal	Principal	Date of Release	Version	

### <u>OE List–</u>

Open Elective				
Sr. no.		OE-I	OE-II	OE-III
		Semester III	Semester IV	Semester V
1	Course Code	BDS32307	BDS32407	B\$\$335XX
	Subjects	OOPs with C++	Introduction to Data Science	Software Engineering and Quality Assurance

## PEC List:-

	Professional Elective Courses								
G N	Doma	nin wise Cluster	PEC-I	PEC-II	PEC-III	PEC-IV	PEC-V		
Sr. No		Semester	V	VI		VII	VIII		
		Course Code	BDS33507	BDS33605	BDS33609-12	BDS34702	BDS34803		
1	Domain-1	Network and Security	Cyber Security	Mobile and Adhoc Network	Cyber Law	Cyber Forensic	Evidence Acquisition and Recovery		
		Course Code	BDS33508	BDS33606	BDS33610	BDS34703	BDS34804		
2	Domain-2	AI and IoT	Generative AI	Data Visualization Techniques	Natural Language Processing	IoT for Social Good	Industrial and Medical IoT		
		Course Code	BDS33509	BDS33607	BDS33611	BDS34704	BDS34805		
3	Domain-3	Computing	Cloud Computing	Mobile Computing	Distributed Computing	Big Data Computing	Reconfigurable Computing		
		Course Code	BDS33510	BDS33608	BDS33612	BDS34705	BDS34806		
4	Domain-4	Programming Languages	R Programming	Client Side Scripting-Java Script	Server Side Scripting-PHP	Python for Data Science	NoSQL		

Head of Department CSE - Data Science rulairamiji Galkwade - Vi College of Engineering and Tect	Dean Academics Fulsiramji Gaikwad-Pati College Of Engineering and Technology. Nagau	Vice Policipat Tulisianiji Citived-Patti Critiga of diptheering 8 Recursiogs, Naopur, 1	Dr. Premanand Naktode Principal TGPCET, Nagpur	Aug,2023	1.00	Applicable for A Y 2023- 24 Onwards
Chairperson	Dean Academics	Vice Principal	Principal	Date of Release	Version	

Tulsiramji Gaikwad-Patil College of Engineering and Technology											
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	(A)	n Autonomous Ir	Stitute Amilated to	RIM Nagpur U	niversity, Nagp	ur)					
Frogram: b. reen Second Year (USE- Data Science)     Somester   Course Code   Course Name											
	Sen	nester		401	Course						
Tee	1 ching	V Sahama	Examination	+01	Examination	g System					
Iea	eaching Scheme Examination Scheme(11) Examination Scheme(1)										
Theory(	Th)	2 Hr / Week	CT-I	7	-	-					
Practica	l(P)	-	CT-II		-	-					
Total C	redits	2	CA	5	-	-					
Dur	ation o	f ESE: 2 Hrs	ESE	30	-	-					
			Total Marks	50	-	-					
Pre-Requisites:											
Course Outcomes:											
CO1 Analyze the evolution of OS functionality, structures and layers.											
CO3 Estin	nate pa	ge replacement algo	prithms, memory manage	gement problems a	nd segmentation.						
CO3 Estimate page replacement algorithms, memory management problems and segmentation.											
Unit I     Introduction: Evolution of OS, Types of OS, Basic h/w support necessary for modern operating systems, services provided by OS, system programs and system calls, OS structure: Layered, Monolithic, Microkernel Operating Systems.       Process Management: Process concept, Process control Block, Process states, Primitive and											
Unit II	Unit II Non-Primitive Processes, Types of scheduler, context switch, threads, multithreading model Scheduling: Goals of scheduling and different scheduling algorithm (FIFO, SJF, Priority, and Round Robin).										
Unit IIIMemory Management: Contiguous allocation, Relocation, Paging, Segmentation, Segmentation with paging, demand paging, page faults and instruction restart, page replacement algorithmsFile Systems: File concept, Access methods, Disk space management and space allocation strategies, directory structures, Recovery, Log-structured File System, disk scheduling											
Text Boo	ks										
1	Opera Indian	ting System Concept Edition (2010).	ots (8th Edition) by Si	lberschatz, Peter 1	B. Galvin and Gr	eg Gagne, Wiley					
2	Moder	n Operating System	s (Third Edition) by Ar	ndrew S Tanenbau	m, Prentice Hall II	ndia (2008)					
3	Operat	ting Systems by D.M	1. Dhamdhere, Tata Mo	cGraw Hill 2nd edi	tion						
Reference	e Book	XS									
Operating Systems (5th Ed) – Internals and Design Principles by William Stallings, Prentice Hall         India, 2000											
2 Operating System: Concepts and Design by Milan Milenkovik, McGraw Hill Higher Education											
Useful Links											
1	https://	/nptel.ac.in/courses/	106/105/106105214/								
2	https://	/nptel.ac.in/courses/	106/102/106102132/								
L	2 https://nptel.ac.in/courses/106/102/106102132/										

24 C	Tu	ılsiramji Gaikv	vad-Patil College o	of Engineering	and Technolo	gy 🦱					
7 •7			WardhaRoad,Nag	pur-441108							
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	<b>(A</b> )	n Autonomous Ir	stitute Affiliated to	RTM Nagpur U	niversity, Nagp	ur)					
Program: B.Tech Second Year (CSE- Data Science)											
SemesterCourse CodeCourse Name											
	Γ	V	BDS324	402	Theory of C	Computation					
Tea	ching	Scheme	Examination	Scheme(Th)	Examination	n Scheme(P)					
Theory(	ory(Th) 3 Hr / Week CT-I 15 -										
Practica	l(P)	-	СТ-ІІ		-	-					
Total C	redits	3	СА	10	-	-					
Dur	ation o	f ESE: 3 Hrs	ESE	60	-	-					
			Total Marks	100	-	-					
Pre-Requ	isites:			1	I						
Course C	Outcon	nes:									
Understand formal language, translation logic, essentials of translation, alphabets, language											
representation and apply it to design Finite Automata and its variants											
CO2 Cons	CO2 <b>Construct</b> regular expression to present regular language and understand pumping lemma for RE										
CO3 <b>Design</b> Context Free Grammars and learn to simplify the grammar											
CO4 Construct Pushdown Automaton model for the Context Free Language Design Turing Machine for the different requirements outlined by theoretical computer science											
CO5 Understand different classes of problems, classify and analyze them and study concepts of NP											
completeness											
Course Content											
	<b>Finite Automata (FA):</b> An informal picture of FA, Finite State Machine (FSM), Languag										
Unit I	accep	ted by FA, Defii	nition of Regular La	inguage. FA with	nout output: D	eterministic and					
	DFAs, FA with output: Moore and Mealy machines -Definition, models, inter-conversion										
	Regu	lar Expression: (	Operators of RE Pre	ecedence of oper	rators Algebraic	a laws for RE					
Unit II	Langi	age to Regular H	Expressions. Equivale	ence of two REs	. Pumping Lem	ma for Regular					
	langu	ages, Closure and	Decision properties of	of Regular langua	ges.	8					
	CFG	& CFL: Basic I	Elements of Gramma	r Formal Defini	tion of Context	Free Grammar,					
	Sente	ntial form, Deriva	tion and Derivation	Tree/ Parse Tree	, Context Free L	anguage (CFL),					
Unit III	Ambi	guous Grammar,	writing grammar for	language. Simpli	fication of CFG	: Eliminating $\epsilon$ -					
	produ	ctions, unit prod	uctions, useless pro	duction, and us	eless symbols.	Normal Forms:					
	Chom	isky Normal For	m, Greibach Norma	al Form, Pumpi	ng Lemma for	CFG, Closure					
	prope	rties of CFL, Deci	sion properties of CF	L, Chomsky Hie	rarchy						
	Pusno and E	nown Automata:	Formal definition of I	PDA, Equivalence	contaxt Erea La	by Final State					
Unit IV	E E E	mpty stack, Non- $\alpha$	d CEG PDA vs CEL	rDA), rDA allu s Deterministic (	The La	liguage,					
	Turin	a Machines. For	mal definition of Turi	ng Machines I a	uruage Accental	hility by Turing					
	Mach	ines. Design of Th	M. Description of TM	. Techniques for	TM Constructio	n					
	Com	outability Theor	y: Decidable Problem	ms and Un-deci	dable Problems.	Church-Turing					
	Thesis	S.			,	C					
Unit V	Com	plexity Classes: 7	Time and Space Mea	sures, The Class	P, Examples of	f problems in P,					
	The	Class NP, Exam	ples of problems i	n NP, P Probl	em Versus NP	Problem, NP-					
	comp	leteness and hard	Problems.								

<b>Text Bool</b>	<b>ΚS</b>								
1	Michael Sipser, Introduction to the Theory of Computation, CENGAGE Learning, 3								
	rdEdition ISBBN13:978-81-315-2529-6.								
2	Vivek Kulkarni, Theory of Computation, Oxford University Press, ISBN-13: 978-0-19-								
	808458-7.								
Reference	Reference Books								
1	Operating Systems (5th Ed) – Internals and Design Principles by William Stallings, Prentice								
1	Hall India, 2000								
2	Operating System: Concepts and Design by Milan Milenkovik , McGraw Hill Higher								
	Education								
3	Hopcroft Ulman, Introduction to Automata Theory, Languages and Computations, Pearson								
5	Education Asia, 2nd Edition, ISBN: 9788131720479.								
Useful Lir	ıks								
1	https://archive.nptel.ac.in/courses/106/104/106104148/								
2	http://www.digimat.in/nptel/courses/video/106104148/L01.html								
2	http://www.digimat.in/nptel/courses/video/106104148/L01.html								

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Dean Academics Fulsiramji Galkwad-Patil Cellege Of Engineering and Technology, Nagdu

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H•F			WardhaRoad,Nag	pur-441108								
2		n Autonomous In	NAAC Accredited v	with A+ Grad	e r University Nagn							
	Program: B.Tech Second Year (CSE- Data Science)											
Semester       Course Code       Course Name												
	Γ	V	BDS3240	3	Introduction to	Data Science						
Tea	Teaching Scheme       Examination Scheme(Th)       Examination Scheme(P)											
Theory(	Th)	3 Hr / Week	CT-I	15	-	-						
Practica	l(P)	-	CT-II	15	-	-						
Total C	redits	<b>3(Th)</b>	CA	10	CA	25 Marks						
Dur	ation o	f ESE: 3Hrs	ESE	60	ESE	25 Marks						
			Total Marks	100	Total Marks	50 Marks						
Pre-Requ	Pre-Requisites:											
Course Outcomes:												
COI App	CO1 Apply toolboxes in data science											
CO2 Unde	erstand	statistics, measur	e, learn inference free	juency approa	ch							
CO3 Utilit	CO3 Utilize learning models.											
CO5 To analyze and apply network using data science												
Course Content												
Introduction to Data Science Evolution of Data Science, Data Science Roles, Stages in a Data												
<b>Unit I</b> Science Project, Applications of Data Science in various fields, Data Security Issues												
	Dete Collection and Dete Dry Dressering Dete Collection State Dete Dete											
<b>TT 1</b> / <b>TT</b>	Data Collection and Data Pre-Processing Data Collection Strategies, Data Pre-Processing											
Unit II	Discre	etization.	inig, Data integratio		Siormation, Data r	Ceduction, Data						
	Explo	ratory Data Analy	tics Descriptive Stati	stics. Mean. S	tandard Deviation.	Skewness and						
Unit III	Kurto	sis, Box Plots, Piv	otTable, Heat Map, C	Correlation Sta	atistics, ANOVA							
	Regre	ssion: Linear R	Regression, Simple	Linear Regi	ession, Multiple	& Polynomial						
Unit IV	Regre	ssion. Unsupervis stering.	ed Learning, Clusteri	ng, Similarity	and Distances, Qua	ality Measures						
Unit V	<b>Unit V</b> Network Analysis, Graphs, Social networks, centrality, drawing centrality of Graphs, PageRank, ego-networks, Community Detection											
Text Boo	ks											
1	1 Data Science from Scratch-Joel Grus											
2	Introd Soren	luction to Data Str son, McGraw Hill	uctures With Applica Education India Pvt	tions, 2 <sup>nd</sup> Edit Ltd.	ion by Jean-Paul Tr	emblay Paul						
3	Data	Science for Busine	ess- Tom Fawcett									
Reference	e Book	S										
1	Desig	ning data-Intensiv	e Applications-Marti	n Kleppmann								
2	Data S	Science and Big D	ata Analytics- EMC	Education Ser	vices							
3	The D	Data Science Hand	book- Field Cady									

Useful Lir	nks
1	https://archive.nptel.ac.in/courses/110/106/110106072/
2	https://archive.nptel.ac.in/courses/106/106/106106179/

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Program: B.Tech Second Year (CSE- Data Science)SemesterCourse CodeCourse NameIntroduction to Data Science LaTeaching SchemeExamination Scheme(Th)Examination Scheme(P)Theory(Th)-CT-IPractical(P)2 Hrs/weekCT-IITotal Credits1CA-CA25 MarketDuration of ESE:ESE-ESE25 MarketPre-Requisites:CO1Understand basic concepts of data science and key issuesCO2Understand data collection and pre-processingCO2Understand data collection and pre-processingCO3Apply statistical analytics on datasetsCO4Implement regression models on datasetsCO5Implement model evaluation and validation of datasetsSr.noList of Experiments	Tulsiramji Gaikwad-Patil College of Engineering and Technology WardhaRoad,Nagpur-441108 NAAC Accredited with A+ Grade (An Autonomous Institute Affiliated to RTM Nagpur University, Nagpur)Image: College of Engineering and Technology University, Nagpur)										
Semester     Course Code     Course Name       IV     BDS32405     Introduction to Data Science La       Teaching Scheme     Examination Scheme(Th)     Examination Scheme(P)       Theory(Th)     -     CT-I     -     -       Practical(P)     2 Hrs/week     CT-II     -     -     -       Total Credits     1     CA     -     CA     25 Marks       Duration of ESE:     ESE     -     ESE     25 Marks       Pre-Requisites:     Total Marks     -     Total Marks     50 Marks       CO1     Understand basic concepts of data science and key issues     -     Total Marks     50 Marks       CO2     Understand data collection and pre-processing     -     -     -       CO3     Apply statistical analytics on datasets     -     -     -       CO4     Implement regression models on datasets.     -     -     -       CO5     Implement model evaluation and validation of datasets.     -     -     -	Program: B.Tech Second Year (CSE- Data Science)										
IV   BDS32405   Introduction to Data Science La     Teaching Scheme   Examination Scheme(Th)   Examination Scheme(P)     Theory(Th)   -   CT-I   -   -     Practical(P)   2 Hrs/week   CT-II   -   -   -     Total Credits   1   CA   -   CA   25 Marks     Duration of ESE:   ESE   -   ESE   25 Marks     Duration of ESE:   ESE   -   ESE   25 Marks     Pre-Requisites:   Total Marks   -   Total Marks   50 Marks     CO1   Understand basic concepts of data science and key issues   CO2   Understand data collection and pre-processing     CO3   Apply statistical analytics on datasets   CO4   Implement regression models on datasets.     CO4   Implement model evaluation and validation of datasets.   Sr.no   List of Experiments	Course Name	e Code	Cours	nester	Sen						
Teaching SchemeExamination Scheme(Th)Examination Scheme(P)Theory(Th)-CT-IPractical(P)2 Hrs/weekCT-IITotal Credits1CA-CA25 MarksDuration of ESE:ESE-ESE25 MarksTotal Marks-Total Marks50 MarksPre-Requisites:COUTSE Outcomes:CO2Understand basic concepts of data science and key issuesCO2Understand data collection and pre-processingCO3Apply statistical analytics on datasetsCO4Implement regression models on datasets.CO5Implement model evaluation and validation of datasets.Sr.no	IV BDS32405 Introduction to Data Science Lab										
Theory(Th)-CT-IPractical(P)2 Hrs/weekCT-IITotal Credits1CA-CA25 MarksDuration of ESE:ESE-ESE25 MarksPre-Requisites:Total Marks-Total Marks50 MarksCourse Outcomes:CO1Understand basic concepts of data science and key issuesCO2Understand basic concepts of data science and key issuesCO2Understand data collection and pre-processingCO3Apply statistical analytics on datasetsCO4CO4Implement regression models on datasets.List of ExperimentsList of Experiments	Examination Scheme(P)	tion Scheme(Th)	Examina	Scheme	Teaching						
Practical(P)     2 Hrs/week     CT-II     -     -       Total Credits     1     CA     -     CA     25 Marks       Duration of ESE:     ESE     -     ESE     25 Marks       Duration of ESE:     ESE     -     Total Marks     50 Marks       Pre-Requisites:     Total Marks     -     Total Marks     50 Marks       CO1     Understand basic concepts of data science and key issues     CO2     Understand data collection and pre-processing     -       CO2     Understand data collection and pre-processing     -     -     -       CO3     Apply statistical analytics on datasets     -     -     -       CO4     Implement regression models on datasets.     -     -     -       CO5     Implement model evaluation and validation of datasets.     -     -     -       St.no     List of Experiments     -     -     -     -	ry(Th) _ CT-I										
Total Credits1CA-CA25 MarksDuration of ESE:ESE-ESE25 MarksTotal Marks-Total Marks-Total Marks50 MarksPre-Requisites:Course Outcomes:CO1Understand basic concepts of data science and key issuesCO2Understand data collection and pre-processingCO2Understand data collection and pre-processingCO3Apply statistical analytics on datasetsCO4Implement regression models on datasets.CO5Implement model evaluation and validation of datasets.Sr.noList of Experiments		-	CT-II	2 Hrs/week	ractical(P)	Pra					
Duration of ESE:ESE-ESE25 MarksTotal Marks-Total Marks50 MarksPre-Requisites:Course Outcomes:CO1Understand basic concepts of data science and key issuesCO2Understand basic concepts of data science and key issuesCO2Understand data collection and pre-processingCO3Apply statistical analytics on datasetsCO4Implement regression models on datasets.CO5Implement model evaluation and validation of datasets.Sr.noList of Experiments	CA 25 Marks	-	CA	1	<b>Cotal Credits</b>	Te					
Total Marks     -     Total Marks     50 Marks       Pre-Requisites:     -     Total Marks     50 Marks       Course Outcomes:     -	ESE 25 Marks	-	ESE	of ESE:	Duration of						
Pre-Requisites:       Course Outcomes:       CO1     Understand basic concepts of data science and key issues       CO2     Understand data collection and pre-processing       CO3     Apply statistical analytics on datasets       CO4     Implement regression models on datasets.       CO5     Implement model evaluation and validation of datasets.       Sr.no     List of Experiments	Total Marks 50 Marks	-	Total Marks								
Course Outcomes:       CO1     Understand basic concepts of data science and key issues       CO2     Understand data collection and pre-processing       CO3     Apply statistical analytics on datasets       CO4     Implement regression models on datasets.       CO5     Implement model evaluation and validation of datasets.       Sr.no     List of Experiments	<u> </u>			:	-Requisites	Pre-					
CO1     Understand basic concepts of data science and key issues       CO2     Understand data collection and pre-processing       CO3     Apply statistical analytics on datasets       CO4     Implement regression models on datasets.       CO5     Implement model evaluation and validation of datasets.       Sr.no     List of Experiments	Course Outcomes:										
CO2     Understand data collection and pre-processing       CO3     Apply statistical analytics on datasets       CO4     Implement regression models on datasets.       CO5     Implement model evaluation and validation of datasets.       Sr.no     List of Experiments		issues	ata science and key	basic concepts of da	Understand	CO1					
CO3     Apply statistical analytics on datasets       CO4     Implement regression models on datasets.       CO5     Implement model evaluation and validation of datasets.       Sr.no     List of Experiments	CO2 Understand data collection and pre-processing										
CO4     Implement regression models on datasets.       CO5     Implement model evaluation and validation of datasets.       Sr.no     List of Experiments	CO3 Apply statistical analytics on datasets										
CO5 Implement model evaluation and validation of datasets. Sr.no List of Experiments	CO4 Implement regression models on datasets.										
Sr.no List of Experiments	CO5 Implement model evaluation and validation of datasets.										
1 Perform and implement various control structures in Python											
2 Apply the data frames in python for data reading, preparation and pre-processing											
3 Perform the analysis of various dataset and plot histogram on it.											
4 Study and Implement various clustering models on data sets		data sets	lustering models on	mplement various c	Study and I	4					
5 Study and Implement Polynomial Regression with Python Implementation	tion	Python Implementat	al Regression with	mplement Polynomi	Study and I	5					
6 To Implement Stock market prediction using python		n	ediction using pytho	ent Stock market pre	To Impleme	6					
7 Introduction of Num Pie.				n of Num Pie.	Introduction	7					
8 Introduction of Panda				1 of Panda	Introduction	8					
9 Case Study-1 10 Mini Project/Case study				t/Casa study	Case Study-	9					
Text Books				l'Case study	t Books	Tovt					
1   CathyO 'Neiland Rachel Schutt," Doing Data Science", O'Reilly,2015											
2 Raj, Pethuru, "Handbook of Research on Cloud Infrastructures for Big Data Analytics", IGIGlobal											
Reference Books											
1 Jojo Moolayil, "Smarter Decisions: The Intersection of IoT and DataScience", PACKT, 2016.	DataScience",PACKT,2016.	section of IoT and I	Decisions: The Inter	Ioolayil, "Smarter l	1 Jojo N	1					
2 David Dietrich, Barry Heller, Beibei Yang, "Data Science and Big data Analytics", EMC 2013	2										
Useful Links					ful Links	Usef					
1 https://archive.nptel.ac.in/courses/110/106/110106072/		6/110106072/	in/courses/110/106	//archive.nptel.ac.	1 <u>https:</u>						
2 https://archive.nptel.ac.in/courses/106/106/106106179/		5106179/	courses/106/106/10	//archive.nptel.ac.in/	2 https://						



WardhaRoad,Nagpur-441108       NAAC Accredited with A+ Grade       Course Code     Course Name       Mathematics in Data Science       Semester     Course Code     Course Name       WardhaRoad,Nagpur University, Nagpur)       Trogram: B.Tech Fourth Year (CSE- Data Science)       Semester     Course Code        Tota Craching Scheme     Examination Scheme(Th)     Examination Scheme(T)       Total Craching Scheme     Course Code     Course Content       Total Craching Scheme     Course Content       Course Content       Course Content       Course Content       Course Content       Confidence interval for means, Confidence interval estimates, Confidence interval for differences and sums of mean and proportions.     Confidence interval for differences and sums of mean and proportions.       Sampling Theory: Population and sample, Sampling with and without replacement, differences and sums of mean and proportions.       Sampling Theory: Population and sample, Sampling with and without replacement, quistrubutino of proportions.	<b>3</b>	Tulsiramji Gaikwad-Patil College of Engineering and Technology						
NAAC Accredited with A+ Grade (An Autonomous Institute Affiliated to RTM Nagpur University, Nagpur)         Program: B.Tech Fourth Year (CSE- Data Science)         Semester       Course Code       Course Name         IV       BSH32402       Mathematics in Data Science         Teaching Scheme       Examination Scheme(Th)       Examination Scheme(P)         Theory(Th)       2 Hrs/week       CT-I       7 Marks       -         Practical(P)       -       CT-II       7 Marks       -       -         Duration of ESE:2Hrs       ESE       30 Marks       -       -         Duration of ESE:2Hrs       ESE       30 Marks       -       -         Course Outcomes:       Total Marks       50 Marks       -       -         CO2 Apply the most appropriate Sampling Techniques for a given applied problems       CO2 Apply the most appropriate Sampling Techniques for a given applied problems       CO3 Apply the most appropriate Sampling techniques for a given applied problems         CO3 Apply the most appropriate Sampling techniques for a given applied problems       Course Outcomes         CO1 forace interval for means, Confidence interval for differences and sums of mean and proportions.       Sampling Theory: Population and sample, Sampling distribution of means, and Sampling distribution of proportions	<b>F•</b> F	WardhaRoad,Nagpur-441108						
Program: B.Tech Fourth Year (CSE- Data Science)         Semester       Course Code       Course Name         IV       BSH32402       Mathematics in Data Science         Teaching Scheme       Examination Scheme(Th)       Examination Scheme(P)         Theory(Th)       2 Hrs/week       CT-I       7 Marks       -         Practical(P)       -       CT-II       7 Marks       -       -         Total Credits       2(Th)       CA       6 Marks       -       -         Duration of ESE:2Hrs       ESE       30 Marks       -       -         Course Outcomes:       Total Marks       50 Marks       -       -         CO1       Analyze and interpret results from point and interval estimates.       CC2       Apply the most appropriate Sampling Techniques for a given applied problems         CO3       Apply the most appropriate Sampling Techniques for a given applied problems       Course Content         Estimation Theory: Unbiased and efficient estimates, Point estimates and interval estimates, Orifdence interval for differences and sums of mean and proportions.       Sampling Theory: Population and sample, Sampling distribution of means, and Sampling distribution of means, and Sampling distribution of proportions.       Alternative Hypothesis, Alternative Hypothesis, Stesting; Introduction, significant level and p-v	ولللور	NAAC Accredited with A+ Grade						
Series From Portent Point and Performance Color Botter (Color Botter)         W BSH32402 Mathematics in Data Science         Teaching Scheme       Examination Scheme(Th)       Examination Scheme(P)         Theory(Th)       2 Hrs/week       CT-I       7 Marks       -         Practical(P)       -       CT-II       7 Marks       -         Total Credits       2(Th)       CA       6 Marks       -         Total Credits       2(Th)       CA       6 Marks       -         Total Credits       2(Th)       CA       6 Marks       -         Total Marks       5 OM Arks       -       -         Total Marks       5 OM Arks       -         CO       And interpret results from point and interval estimates.         CO1       Analyze and interpret results from point and interval estimates.         CO1       Analyze and interpret results from point and	- (An Autonomous institute Annateu to KTW Wagpur University, Wagpur) Program: B Tach Fourth Vear (CSF_ Data Science)							
IV       BSH32402       Mathematics in Data Science         Teaching Scheme       Examination Scheme(Th)       Examination Scheme(P)         Theory(Th)       2 Hrs/week       CT-I       7 Marks       -         Practical(P)       -       CT-II       7 Marks       -       -         Total Credits       2(Th)       CA       6 Marks       -       -         Duration of ESE:2Hrs       ESE       30 Marks       -       -         Ourse Outcomes:       COI       Analyze and interpret results from point and interval estimates.       COC       Apply the most appropriate Sampling Techniques for a given applied problems         CO3       Apply the most appropriate Sampling Techniques for a given applied problems       Confidence interval for means, Confidence interval for proportions, Confidence interval for differences and sums of mean and proportions.       Sampling Theory: Unbiased and efficient estimates, Point estimates and interval estimates, Confidence interval for proportions, Confidence interval for proportions, Confidence interval for proputions of proportions.         Unit II       Population parameters, sample statistics, Sampling distribution of means, and Sampling distribution of means, and Sampling distribution of proportions.       Hypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative Hypothesis, Type-I and Type-II errors, confidence interval, hypothesis, Alternative quare test.		Semester   Course Code   Course Name						
Teaching Scheme       Examination Scheme(Th)       Examination Scheme(P)         Theory(Th)       2 Hrs/week       CT-I       7 Marks       -         Practicat(P)       -       CT-II       7 Marks       -         Total Credits       2(Th)       CA       6 Marks       -         Duration of ESE:2Hrs       ESE       30 Marks       -       -         Total Credits       2(Th)       CA       6 Marks       -       -         Ourse Outcomes:       Total Marks       50 Marks       -       -       -         CO1       Analyze and interpret results from point and interval estimates.       CO2 Apply the most appropriate Sampling Techniques for a given applied problems       -       -         CO3       Apply the most appropriate Sampling Techniques for a given applied problems       CO3 Apply the most appropriate Sampling Techniques for proportions, Confidence interval stimates, Point estimates and interval estimates, Confidence interval for means, Confidence interval for proportions, Confidence interval for means, Confidence interval for proportions, Confidence interval for differences and sums of mean and proportions.       Sampling Theory: Population and sample, Sampling with and without replacement, Hupothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative Hypothesis, Type-I and Type-II errors, confidence interval, hypothesis test, t-Test, Z-test, chi square test. <th></th> <th>IV</th> <th>7</th> <th colspan="2">BSH32402</th> <th colspan="3">Mathematics in Data Science</th>		IV	7	BSH32402		Mathematics in Data Science		
Theory(Th)       2 Hrs/week       CT-I       7 Marks       -       -         Practical(P)       -       CT-II       7 Marks       -       -         Total Credits       2(Th)       CA       6 Marks       -       -         Duration of ESE:2Hrs       ESE       30 Marks       -       -       -         Pre-Requisites: NA       -       -       -       -       -         Course       Outcomes:       -       -       -       -         COI       Analyze and interpret results from point and interval estimates.       -       -       -         COI       Analyze and interpret results from point and interval estimates.       -       -       -         COI       Analyze and interpret results from point and interval estimates.       -       -       -         COI       Analyze and interpret results from point and interval estimates.       -       -       -       -         COI       Analyze and interpret results from point and interval estimates.       -       -       -       -         COI       Analyze and interpret results from point and efficient estimates.       -       -       -       -<	Tea	ching	Scheme	<b>Examination Scheme(Th)</b>		Examination Scheme(P)		
Practical(P)-CT-II7 Marks-Total Credits2(Th)CA6 Marks-Duration of ESE:2HrsESE30 MarksPre-Representation of ESE:2HrsESE30 MarksPre-Representation of ESE:2HrsESE30 MarksPre-Representation of ESE:2HrsESE30 MarksColspan="4">Colspan="4">Pre-Representation of ESE:2HrsESEColspan="4">C	Theory(	(Th)	2 Hrs/week	CT-I	7 Marks	-	-	
Total Credits       2(Th)       CA       6 Marks       -       -         Duration of ESE:2Hrs       ESE       30 Marks       -       -         Pre-Requisites: NA       Total Marks       50 Marks       -       -         Course       Outcomes:       -       -       -         COI       Analyze and interpret results from point and interval estimates.       -       -         CO2       Apply the most appropriate Sampling Techniques for a given applied problems       -       -         CO3       Apply hypothesis testing to real-world scenarios.       -       -       -         Confidence interval for means, Confidence interval for proportions, Confidence interval estimates, of free interval for differences and sums of mean and proportions.       -       -         Unit II       Population parameters, sample statistics, Sampling with and without replacement, Population of proportions       -       -         Hypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative square test.       -       -         Text Books       -       -       -       -       -         1       Higher Engineering Mathematics by Erwin Kreyszig, 8th Edition, Wiley India       -       -       -       -	Practica	<b>ul(P</b> )	-	CT-II	7 Marks	-	-	
Duration of ESE:2Hrs     ESE     30 Marks     .     .       Total Marks     50 Marks     .     .       Pre-Requisites: NA     .     .     .       Course Outcomes:     .     .     .     .       COI     Analyze and interpret results from point and interval estimates.     .     .     .       CO2     Apply the most appropriate Sampling Techniques for a given applied problems     .     .     .       CO3     Apply hypothesis testing to real-world scenarios.     .     .     .     .       CO3     Apply the most appropriate Sampling Techniques for a given applied problems     .     .     .     .       CO3     Apply hypothesis testing to real-world scenarios.     .	Total C	Credits	<b>2(Th)</b>	CA	6 Marks	-	-	
Image: Pre-Requisites: NA     50 Marks     -       Ourse Uutcomes:       CO1       Analyze and interpret results from point and interval estimates.       CO2     Apply the most appropriate Sampling Techniques for a given applied problems       CO3     Apply hypothesis testing to real-world scenarios.       Content       Confidence interval scenarios.       Confidence interval for means, Confidence interval for proportions, Confidence interval for differences and sums of mean and proportions.       Sampling Theory: Population and sample, Sampling with and without replacement, distribution of proportions       Hypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative square test.       Unit II       Hypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative square test.       Unit III       Hypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative square test.       Terest Boots       Implication Theory: Vipe-II errors, confidence interval, hypothesis test, t-Test, Z-test, chi square test.       Implication of proportions       Implication of proportions       Implicatinon differences and sums of means, confidence interval	Dur	ation o	f ESE:2Hrs	ESE	30 Marks	-	-	
Pre-Requisites: NA       Course Outcomes:       Constant of the presentation of th				Total Marks	50 Marks	-	-	
Course Outcomes:       CO1     Analyze and interpret results from point and interval estimates.       CO2     Apply the most appropriate Sampling Techniques for a given applied problems       CO3     Apply the most appropriate Sampling Techniques for a given applied problems       CO3     Apply the most appropriate Sampling Techniques for a given applied problems       CO3     Apply the most appropriate Sampling Techniques for a given applied problems       CO3     Apply the most appropriate Sampling Techniques for a given applied problems       CO3     Apply the most appropriate Sampling Techniques for a given applied problems       CO3     Apply the most appropriate Sampling Techniques for a given applied problems       CO3     Apply the most appropriate Sampling Techniques for a given applied problems       CO4     Confidence interval for means, Confidence interval for proportions, Confidence interval for means, Confidence interval for proportions, Confidence interval for means, and frequence, Sampling distribution of proportions       Unit II     Population parameters, sample statistics, Sampling distribution of means, and Sampling distribution of proportions       Hypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative Hypothesis, Type-I and Type-II errors, confidence interval, hypothesis test, t-Test, Z-test, chi square test.       1     Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication	Pre-Requ	uisites	NA					
COI     Analyze and interpret results from point and interval estimates.       CO2     Apply the most appropriate Sampling Techniques for a given applied problems       CO3     Apply hypothesis testing to real-world scenarios.       Course Content       Course Content       Stimation Theory: Unbiased and efficient estimates, Point estimates and interval estimates, Confidence interval for means, Confidence interval for proportions, Confidence interval for differences and sums of mean and proportions.       Unit II     Sampling Theory: Population and sample, Sampling with and without replacement, Population parameters, sample statistics, Sampling distribution of means, and Sampling distribution of proportions       Unit II     Hypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative Hypothesis, Type-I and Type-II errors, confidence interval, hypothesis test, t-Test, Z-test, chi square test.       Text Books     I       1     Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication       2     Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition, Wiley India       3     Essential Math for Data Science for , by Thomas Nield       Reference     Books       1     A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan       2     Introductory methods of Numerical Analysis, by S.S. Sastry, PHI </th <th>Course (</th> <td>Outcon</td> <td>nes:</td> <th></th> <td></td> <td></td> <td></td>	Course (	Outcon	nes:					
CO2 Apply the most appropriate Sampling Techniques for a given applied problems       CO3 Apply the most appropriate Sampling Techniques for a given applied problems       Course Content       Course Content       Confidence interval for means, Confidence interval for proportions, Confidence interval for differences and sums of mean and proportions.       Sampling Theory: Population and sample, Sampling with and without replacement, Population parameters, sample statistics, Sampling distribution of means, and Sampling distribution of proportions       Unit II       Hypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative Hypothesis, Type-I and Type-II errors, confidence interval, hypothesis test, t-Test, Z-test, chi square test.       Text Books       1     Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication       2     Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition, Wiley India       3     Essential Math for Data Science for , by Thomas Nield       Reference Books       1     A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan       2     Introductory methods of Numerical Analysis, by S.S. Sastry, PHI	CO1 Ana	lyze an	d interpret resul	ts from point and	interval estimates.			
Course Content       Course Content       Course Content       Estimation Theory: Unbiased and efficient estimates, Point estimates and interval estimates, of differences interval for means, Confidence interval for proportions, Confidence interval for differences and sums of mean and proportions.       Sampling Theory: Population and sample, Sampling with and without replacement, Population parameters, sample statistics, Sampling distribution of means, and Sampling distribution of proportions       Hypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative Hypothesis, Type-I and Type-II errors, confidence interval, hypothesis test, t-Test, Z-test, chi square test.       Text Books       1     Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication       2     Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition, Wiley India       3     Essential Math for Data Science for , by Thomas Nield       Reference Books       1     A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan       2     Introductory methods of Numerical Analysis, by S.S. Sastry, PHI	CO2 App	ly the r	nost appropriate	Sampling Techni	ques for a given a	pplied problems		
Course contentUnit IEstimation Theory: Unbiased and efficient estimates, Point estimates and interval estimates, Confidence interval for means, Confidence interval for proportions, Confidence interval for differences and sums of mean and proportions.Unit IISampling Theory: Population and sample, Sampling with and without replacement, Population parameters, sample statistics, Sampling distribution of means, and Sampling distribution of proportionsUnit IIIHypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative Hypothesis, Type-I and Type-II errors, confidence interval, hypothesis test, t-Test, Z-test, chi square test.1Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication2Advanced Engineering Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona 	CO3 App	<b>iy</b> nypo	othesis testing to	real-world scenar	105. Contont			
Unit I     Confidence interval for means, Confidence interval for proportions, Confidence interval for differences and sums of mean and proportions.       Unit I     Sampling Theory: Population and sample, Sampling with and without replacement, Population parameters, sample statistics, Sampling distribution of means, and Sampling distribution of proportions       Unit II     Population parameters, sample statistics, Sampling distribution of means, and Sampling distribution of proportions       Hypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative Hypothesis, Type-I and Type-II errors, confidence interval, hypothesis test, t-Test, Z-test, chi square test.       1     Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication       2     Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition, Wiley India       3     Essential Math for Data Science for , by Thomas Nield       Reference Books     1       1     A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona       2     Introductory methods of Numerical Analysis, by S.S. Sastry, PHI		Fstim	ation Theory	Unbiased and effi	cient estimates Po	oint estimates and i	nterval estimates	
Office     Differences and sums of mean and proportions.       Sampling Theory: Population and sample, Sampling with and without replacement,       Population parameters, sample statistics, Sampling distribution of means, and Sampling distribution of proportions       Unit III     Hypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative Hypothesis, Type-I and Type-II errors, confidence interval, hypothesis test, t-Test, Z-test, chi square test.       Text Books     I       1     Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication       2     Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition, Wiley India       3     Essential Math for Data Science for , by Thomas Nield       Reference Books     I       1     A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan       2     Introductory methods of Numerical Analysis, by S.S. Sastry, PHI	Unit I	Confidence interval for means. Confidence interval for proportions. Confidence interval for						
Sampling Theory: Population and sample, Sampling with and without replacement, Population parameters, sample statistics, Sampling distribution of means, and Sampling distribution of proportionsUnit IIIHypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative Hypothesis, Type-I and Type-II errors, confidence interval, hypothesis test, t-Test, Z-test, chi 	0	differences and sums of mean and proportions.						
Unit IIPopulation parameters, sample statistics, Sampling distribution of means, and Sampling distribution of proportionsUnit IIIHypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative Hypothesis, Type-I and Type-II errors, confidence interval, hypothesis test, t-Test, Z-test, chi square test.1Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication2Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition, Wiley India3Essential Math for Data Science for , by Thomas NieldReferenceBooks1A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan2Introductory methods of Numerical Analysis, by S.S. Sastry, PHI		Sampling Theory: Population and sample, Sampling with and without replacement,						
distribution of proportions       Unit III       Hypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative Hypothesis, Type-I and Type-II errors, confidence interval, hypothesis test, t-Test, Z-test, chi square test.       Text Books       1     Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication       2     Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition, Wiley India       3     Essential Math for Data Science for , by Thomas Nield       Reference Books       1     A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan       2     Introductory methods of Numerical Analysis, by S.S. Sastry, PHI	Unit II	Population parameters, sample statistics, Sampling distribution of means, and Sampling						
Unit IIIHypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative Hypothesis, Type-I and Type-II errors, confidence interval, hypothesis test, t-Test, Z-test, chi square test.Text Books1Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication2Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition, Wiley India3Essential Math for Data Science for , by Thomas NieldReferenceBooks1A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan2Introductory methods of Numerical Analysis, by S.S. Sastry, PHI		distribution of proportions						
Unit III     Hypothesis, Type-I and Type-II errors, confidence interval, hypothesis test, t-Test, Z-test, chi square test.       Text Books       1     Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication       2     Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition, Wiley India       3     Essential Math for Data Science for , by Thomas Nield       Reference     Books       1     A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan       2     Introductory methods of Numerical Analysis, by S.S. Sastry, PHI		Hypothesis testing: Introduction, significant level and p-value, Null Hypothesis, Alternative						
square test.       Text Books       1     Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication       2     Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition, Wiley India       3     Essential Math for Data Science for , by Thomas Nield       Reference Books     1       1     A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan       2     Introductory methods of Numerical Analysis, by S.S. Sastry, PHI	Unit III	Hypot	Hypothesis, Type-I and Type-II errors, confidence interval, hypothesis test, t-Test, Z-test, chi					
Text Books       1     Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication       2     Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition, Wiley India       3     Essential Math for Data Science for , by Thomas Nield       Reference Books       1     A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan       2     Introductory methods of Numerical Analysis, by S.S. Sastry, PHI		square test.						
1     Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication       2     Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition, Wiley India       3     Essential Math for Data Science for , by Thomas Nield       Reference Books       1     A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan       2     Introductory methods of Numerical Analysis, by S.S. Sastry, PHI	Text Books							
2     Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition, Wiley India       3     Essential Math for Data Science for , by Thomas Nield       Reference Books       1     A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan       2     Introductory methods of Numerical Analysis, by S.S. Sastry, PHI	1	Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication						
3     Essential Math for Data Science for , by Thomas Nield       Reference Books       1     A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan       2     Introductory methods of Numerical Analysis, by S.S. Sastry, PHI	2	Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition, Wiley India						
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1A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan2Introductory methods of Numerical Analysis, by S.S. Sastry, PHI	Reference Books							
2 Introductory methods of Numerical Analysis, by S.S. Sastry, PHI	1	A Text Book of applied Mathematics, Volume II, by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan						
	2	Introd	Introductory methods of Numerical Analysis, by S.S. Sastry, PHI					

Head of Department CSE - Data Science 'Ulsizemji Gatwad-P-'d College of Engineering and Tect ev. Nagyu



Ľ,	Tulsiramji Gaikwad-Patil College of Engineering and Technology Wardha Road, Nagpur - 441108 NAAC Accredited with A+ Grade (An Autonomous Institute Affiliated to RTM Nagpur University, Nagpur)							
Program: B.Tech Second Year (CSE- Data Science)								
	Semester       Course Code       Course Name							
		IV		BSH32404		Leadership and Team Dynamics		
	Teach	ing S	cheme	Examination Scheme(Th)		Examination Scheme(P)		
Th	eory(Tł	n)	-	CT-I	-	-	-	
Pra	actical(I	P)	2 Hrs/Week	CT-II	-	-	-	
To	otal Cre	dits	2	CA	-	CA	25 Marks	
	Durati	on of I	ESE:	ESE	-	ESE	25 Marks	
				Total Marks	-	<b>Total Marks</b>	50 Marks	
Pre-	<b>Requis</b>	s <mark>ites:</mark> H	Basic Understandi	ng of Organization	al Behavior, Introdu	iction to Managemen	t, Foundations of	
Cou	rse Ou	tcome	s:			xing		
CO1	Analyz	e leade	ership theories and	l evaluate their app	lication in team dyn	amics.		
CO2	Apply	effectiv	ve leadership strat	egies to enhance te	am performance and	d collaboration.		
CO3	Develo	p solut	tions to improve to	eam dynamics throu	ugh leadership and c	conflict resolution.		
Sr.no				List of	Experiments			
1	1 Perform a activity on Icebreakers and Introductions Setting the Stage							
2	Perform	n a act	tivity on Collabo	orative Problem S	olving			
3	Perform	n a act	tivity on Role As	ssignment and Le	adership			
4	Perform	n a act	tivity on Conflic	t Resolution Exer	cise			
5	Periorn	n a act	tivity on Commu	Inication & Lister	ning Skills			
b   Perform a activity on Leam Decision-Making     7   Derform a activity on Trust Dividing Activities								
8	/ Perform a activity on Trust-Building Activities							
9 Perform a activity on Group Reflection and Feedback								
10 Perform a activity on Real-World Engineering Project Simulation								
Text Books								
	1 "Leadership: Theory and Practice" by Peter G. Northouse							
4	2 "Team of Teams: New Rules of Engagement for a Complex World"							
Reference Books								
1	1 "The Five Dysfunctions of a Team: A Leadership Fable" by Patrick Lencioni							
2 "Leaders Eat Last: Why Some Teams Pull Together and Others Don't" by Simon Sinek								
Useful Links								
	1 h	https://nptel.ac.in/courses/110107159						
,	2 h	https://onlinecourses.nptel.ac.in/noc23_mg28/preview						

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00 Dean Academics Fulsinamii Gaikwad-Patil College Of Engineering and Technology. Nagde

C	Tulsiramji Gaikwad-Patil College of Engineering and Technology     WardhaRoad,Nagpur-441108       WardhaRoad,Nagpur-441108     WardhaRoad,Nagpur-441108       (An Autonomous Institute Affiliated to RTM Nagpur University, Nagpur)     Image: Constraint of the second sec							
		Program: 1	B.Tech Second Ye	ear (CSE- Dat	a Science)	**		
	Seme	ester	Course	Code	Course	e Name		
	IV BSH32406 Human Value for Professional							
Tea	ching S	cheme	Examination Scheme(Th)		Examination Scheme(P)			
Theory(	Th)	2 Hrs/week	CT-I	7 Marks	-	-		
Practica	l(P)	-	CT-II		-	-		
Total C	redits	2 (Th)	CA	6 Marks	-	-		
Dur	ation of I	ESE:2 Hrs	ESE	30 Marks	-	-		
			Total Marks	50 Marks	-	-		
Pre-Requ	iisites: ]	NA						
Course C	outcome	es:						
CO1 To e	xplain	the difference b	etween values and	ethics and to en	sure sustained	happiness and		
CO2 To u	ndersta	<b>nd</b> harmony in t	he Family and Societ	v-Human Relatio	nshin			
CO3 To a	pply in	the professional	and ethical life.		nomp.			
		<b>F</b>	Course Cor	ntent				
	Need,	<b>Content and Pr</b>	ocess for Value Edu	cation:-				
Unit I	Meaning and importance of Value Education, Types of Values - Personal Values, Social Values, and Moral Values & Spiritual Values, Relevance of Human values: Integrity,							
	Harmony in the Human Life:-							
Unit II	Define society	Define Harmony and significance of Harmony, Importance of - Harmony in the family, society and human relationship, and understand Harmony with self and Nature						
	Ethics in the Professional Society:-							
Unit III	Nature, characteristics and scope of professional ethics; Types of Professional Ethics, Professional Values: Trusteeship, Inclusiveness, Commitment, Sustainability, Accountability, Transparency, Impartiality.							
Text Books								
1	R.R. Gaur, R Sangal, G.P. Bagaria (2009): A Foundation Course in Human Values and Professional Ethics, Excel Books							
2	D.R. Kiran (2014) Professional Ethics and Human Values, McGraw Hill Education (India).							
Reference Books								
1	LaFollette, Hugh, ed. Ethics in Practice: An Anthology. Cambridge: Blackwell,1997							
2	Vivian L Vignoles (2017): Identity: Personal and Social, Chapter to appear in Oxford Handbook of Personality and Social Psychology (2nded.), edited by Kay Deaux and Mark Snyder.							
3	3 Happiness and Well-Being, NIOS Module V (Health and well-being)							
Useful Links								
	https://o	onlinecourses.npt	el.ac.in/noc23_hs89/pr	eview				
	https://	archive.nptel.ac.i	<u>n/courses/109/104/109</u>	<u>104068</u>				





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ويعلو	Tulsiramji Gaikwad-Patil College of Engineering and Technology						
H•F	WardhaRoad,Nagpur-441108						
	NAAC Accredited with A+ Grade						
		Program:	B.Tech Second Y	ear (CSE- D	ata Science)	ui)	
	Sem	ester	Course C	code	Course	Name	
	I	/	B\$\$324XX		OE – II		
					(Introduction to Data Science)		
Tea	ching S	Scheme	Examination Scheme(Th)		Examination Scheme(P)		
Theory(	( <b>In</b> )	2 Hr / Week		/	-	-	
Practica	l(P)	-	CT-II	7	-	-	
Total C	redits	2(Th)		6	-	-	
Dur	ation of	ESE: 2 Hrs	ESE	30	-	-	
	• • •		Total Marks	50	-	-	
Pre-Requ	iisites:	0.00					
CO2 Unde	y toold retand	oxes in data sciel	ice :a learn inference fre	auency approa	ah		
CO2 Utiliz	ze learr	ning models.		quency approa			
		88	Course Co	ntent			
	Introd	uction to Data Sc	eience Evolution of D	ata Science, D	ata Science Roles,	Stages in a Data	
Unit I	Scienc Archit	e Project, Appl ecture of data, da	ications of Data South the second sec	cience in vari	ous fields, Data	Security Issues.	
Unit II	Data Collection and Data Pre-Processing Data Collection Strategies, Data Pre-Processing Overview, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization.						
Unit III	Exploratory Data Analytics Descriptive Statistics, Mean, Standard Deviation, Skewness and Kurtosis, Box Plots, PivotTable, Heat Map, Correlation Statistics, ANOVA						
Text Boo	ks						
1	Data Science from Scratch-Joel Grus						
2	Introduction to Data Structures With Applications, 2 <sup>nd</sup> Edition by Jean-Paul Tremblay Paul Sorenson, McGraw Hill Education India Pvt Ltd.						
3 Data Science for Business- Tom Fawcett							
Reference	e Book	S					
1	Designing data-Intensive Applications-Martin Kleppmann						
2	Data Science and Big Data Analytics- EMC Education Services						
3	3 The Data Science Handbook- Field Cady						
Useful Lin	nks						
1	https://archive.nptel.ac.in/courses/110/106/110106072/						
2	https://www.youtube.com/playlist?list=PLw5h0DiJ-9PCn4shW4X43FSjEqdBwc1Cn						
3	https://www.youtube.com/watch?v=W01tIRP Rqs						



