

NEHRU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

(Affiliated to Bharathiar University Reaccredited with "A+" Grade by NAAC, ISO 9001:2015 (QMS) Certified, Recognized by UGC with 2(f) &12(B), Under Star College Scheme by DBT, Govt. of India) Nehru Gardens, Thirumalayampalayam, Coimbatore - 641 105, Tamil Nadu, India. E-mail: <u>nascoffice@nehrucolleges.com</u>. Web Site: <u>www.nehrucolleges.net</u>.



REGULATIONS, CURRICULUM & SYLLABUS

M. Sc. DATA SCIENCE



Effective from 2023 - 2024



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DEPARTMENT OF COMPUTER SCIENCE

PROGRAMME: M. Sc. DATA SCIENCE

PROGRAMME OUTCOMES

PO1	Critical Thinking	Demonstrate advanced proficiency in critical thinking skills, evidenced by their ability to analyze complex datasets, and identify patterns.
PO2	Research Skill	Showcase exemplary research skills, adapt at conducting thorough literature reviews, designing robust experiment and employing advanced methodologies to contribute meaningfully to the field of data science.
PO3	Usage of Technology	Exhibit a mastery of cutting – edge technologies, harnessing advanced tools and platforms to manipulate, analyze and visualize complex datasets.
PO4	Effective Communication	Demonstrate proficiency in presenting data – driven insights through compelling visualizations and articulatedocumentation, fostering collaboration and facilitating informed decision – making in diverse professional settings.
PO5	Individual and Team Work	Excel in collaborative team environments, effectively contributing their expertise to interdisciplinary projects, thereby fostering a synergetic approach to addressing complex challenges in the field of data science.
PO6	Project Management	Demonstrate the ability to lead multidisciplinary teams, applying project management principles to optimize resources and successfully navigate the dynamic landscape of data – driven initiatives.
PO7	Ethics and Values	Integrate ethical considerations into decision – making processes, emphasizing the responsible and respectful use of data to address societal challenges and contribute positively to the evolving field of data science.
PO8	Life Long Learning	Proactively engage in continuous professional development, fostering adaptability and a thirst for knowledge to remain at the forefront of advancements in data science throughout their careers.



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DEPARTMENT OF COMPUTER SCIENCE

PROGRAMME: M. Sc. DATA SCIENCE

PROGRAMME SPECIFIC OUTCOMES

PSO 1	Make the students to effectively employ statistical and machine learning techniques to analyze complex datasets, extract meaningful insights, and make data-driven decisions across diverse domains.
PSO 2	Gain proficiency in utilizing programming languages and relevant tools/frameworks to preprocess, clean, and manipulate large-scale datasets efficiently for analysis and modeling purposes.
PSO 3	Expertise in applying data science methodologies in practical scenarios, showcasing their ability to solve real-world problems across industries through project-based learning, internships, or capstone projects.
PSO 4	Build the students with strong understanding of ethical considerations, privacy concerns, and legal regulations pertaining to data collection, storage, and usage. They will exhibit ethical decision-making skills in handling sensitive data and complying with industry standards and regulations.
PSO 5	Improve the ability of students to communicate complex findings and insights derived from data analysis effectively. They will be proficient in creating visualizations, reports, and presentations to convey technical information in a clear and understandable manner to diverse audiences.

REGULATIONS

NEHRU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

REGULATIONS FOR POSTGRADUATE DEGREE COURSES

Choice Based Credit System blended with Outcome based Education Regulations with effect from the Academic Year 2022-2023

Definition

- a) Programme A course of study leading to the award of a degree in a discipline. (E.g.: M. Sc. / M. Com.)
- b) Branch Discipline of study (e.g. M.Sc. Microbiology)
- c) Curriculum The various courses (subjects) a student must study in a particular branch.
- d) Course The theory & practical subject offered under each curriculum.
- e) Credit A unit of measurement based on the duration of the contact hours, content and quality of the subject matter.

1. PG Curriculum

The PG Curriculum follows CBCS pattern and the medium of instruction is English.

2. Eligibility for Admission to the Course

A candidate who has passed the Degree Examination as main subject of study of this University or an examination of some other University accepted by the Syndicate as equivalent thereto shall be eligible for admission to the Master Degree of this College.

3. Duration of the Programme

This Course of Study shall be based on Semester System. This Course shall consist of four Semesters covering a total of two Academic years. For this purpose, each academic year shall be divided into two Semesters; the first and third Semesters; July to November and the second and the fourth Semesters; December to April. The Practical Examinations shall be conducted at the end of odd / even Semester. Each semester have 90 working days consists of 5 teaching hours per working day. Thus, each semester has 450 teaching hours and the whole programme has **1800 teaching hours**.

4. Choice Based Credit System (CBCS)

All Postgraduate Programmes offered by the University shall be under Choice Based Credit System (CBCS). Choice based credit system is introduced with the aim of offering flexibility in the choice of courses to the students.

Objectives of the Choice Based Credit System :

- > To facilitate the students to have greater flexibility in their choice of courses.
- > To revamp the curriculum, to impart entrepreneurial skills and placement potentials qualities.
- To incorporate need based knowledge in tune with the location and neighborhood of the institution.
- To allocate credit points to each paper of the study based on the weightage of the contact hours, content and quality.
- To extend opportunities to fast learners in order to earn Extra credit from advanced as well as additional courses.
- To maintain the total credit points of each programme on par with international standards.

5. Outcome Based Education (OBE)

OBE is an **educational** theory that bases each part of an **educational** system around goals (**outcomes**). By the end of the **educational** experience, each student should have achieved the goal.

Objectives of Outcome based curriculum :

- The programme outcomes and Programme specific outcomes are clearly identified and unambiguously specified regarding the content, context and competence.
- The expected outcome should be defined by setting bench marks for each level of the programme. Benchmark should tackle and define specifically, the goals of the curriculum and verify ways to access whether the students have reached these goals at the level of study;
- OBE is driven by assessments that focus on well defined learning outcomes and not by other factors such as what is taught, the duration taken by the student to achieve the outcomes or which path the students take to achieve their targets. In OBE, assessment techniques must be with clear description of expected performance.

Definitions

Outcome : An outcome of an educational Programme is what the student should be able to do at the end of a Programme/ course/ instructional unit.

Levels of Outcomes

- Programme Outcomes: POs are statements that describe what the students graduating from any of the educational Programmes should be able to do.
- Programme Specific Outcomes: PSOs are statements that describe what the graduates of a specific educational Programme should be able to do.
- Course Outcomes: COs are statements that describe what students should be able to do at the end of a course

Learning Outcomes : It describes levels of achievement that can be attained across the domains of learning. Here K1 representing Remember; K2 -Understanding; K3 - Apply; K4 - Analyze;
K5- Evaluate, K6 – Create are used to measure the levels of achievement in learning.

6. CBCS Curriculum

6.1. Part A : Core Components:

Core Courses : Each programme has a group of core courses. The syllabus of the core courses will facilitate the students in the acquisition of the basic concepts of their respective disciplines, besides getting exposure to the recent developments. This exposure will suitably guide the students towards their vertical mobility in their higher studies. Core courses will last till the fourth semester. It is mandatory for all PG students to complete an online course under SWAYAM / NPTEL platform between 2nd and 3rd semester.

6.2. Part B: Optional Courses - Advanced Learner's Courses : (ALC)

Students are offered the opportunity to undertake optional papers, additional to their compulsory papers, in order to gain additional credit that would boost their grades. These are not mandatory. The course will be a self study nature and the concerned departments will offer guidance. Other Advanced Learner's Courses shall be decided during the conduct of Board of Studies. The Examination will be of Open Book Examination model.

7. Requirement to appear for the examinations

Attendance Requirements for the Students appearing for ESE

- The guidelines of attendance requirement issued by Bharathiar University are adopted by the College. Attendance shall be considered semester- wise (not annually).
- A candidate shall be permitted to appear for the Semester Examinations in any semester, if he / she secures not less than 75% of attendance in the total number of working days during the semester and if his / her progress has been satisfactory, and his / her conduct has been satisfactory.

- Those who have obtained below 75% and above 65% of attendance shall pay condonation fee and shall write the examination in the same semester with due permission from the Principal.
- Those who have below 65% and above 50% of attendance are not eligible to write the examination in current semester subjects but are permitted to continue their studies in the next semester provided that this is the first time that the candidate earned attendance between 50% and 65%. Else the candidates have to discontinue the course and re-join in the same semester subjects in the next year with proper approval of the Principal. However, the candidates are eligible to write arrear subjects if any.
- Those who have below 50% of attendance have to redo the semester.

8. Restrictions to appear for the examinations

- a) Any candidate having arrear paper(s) shall have the option to appear in any arrear paper along with the regular semester papers.
- b) Candidates who fail in any of the course of PG degree examinations shall complete the course concerned within 5 years from the date of admission to the said programme, and if they fail to do so, they shall take the examination in the texts / revised syllabus prescribed for the immediate next batch of candidates. If there is no change in the texts / syllabus they shall appear for the examination in that course with the syllabus in vogue until there is a change in the texts or syllabus. In the event of removal of that course consequent to change of regulation and / or curriculum after 5 year period, the candidates shall have to take up an equivalent course in the revised syllabus as suggested by the Chairman of the concerned board of studies and fulfill the requirements as per the regulation curriculum for the award of the degree.

9. Medium of Instruction and examinations

The medium of Instruction and the medium of Examination is English.

10. Distribution

The following are the distribution of marks for examination & evaluation pattern. Distribution of Marks between End Semester Exam (Theory) and Internal Assessment is 75:25. The following table gives the distribution.

PG - PROGRAMMES (CBCS)

Table 16: Total credit points and tenure of study for M.A., M.Com, M. Sc. and MSW

Part	Courses	Semesters	Credit Points	Marks / Grade
III	Components Core / Electives / Internship / Project / Online course	I to IV	94	2350

11. Additional Credits

Students are given the opportunity to undertake optional papers, additional to their compulsory papers, in order to gain additional credit that would boost their grades. These are not mandatory. Students can earn to a maximum of 15 credits.

S. No.	Subject	Credit / Course	Total Credits
1.	Presentation of Research papers in International Conferences	1	1
2.	Publication of Research Papers in reputed Journals	1	1
3.	Advanced Learners Course	2	4
4.	MOOC Courses / Swayam prescribed by the Departments	2	4
5.	Visits Abroad for Participation in International Academics events	1	1
6.	Representation - Sports / Social Activities / Co curricular / Extracurricular Activities at University / District / State / National / International levels	1	2
7.	Swachh Bharath Summer Internship Programme	2	2
		Total	15

12. Continuous Internal Assessment (CIA)

Three CIA's shall be conducted at regular Intervals. CIA I and II shall be a 2 hours written test for a maximum of 50 marks each and CIA III shall be conducted as Model Examination for ESE.

13. OBE Evaluation - Assignment / Seminar / Role play, etc.

Three OBE Assessment parameters are decided for each course to evaluate the achievement of course outcomes which shall be assessed by the concerned course teacher. The marks allotted to this component will be awarded based on the performance of the candidate. The Rubrics for awarding the marks shall be maintained by the Course Teacher concerned.

14. Distribution of Marks

	External		Internal	Overall Passing	
Total Marks	Max. Marks	Passing Minimum for External alone	nimum Max. Marks alone Minin for Total (Internal +		
100	75	38	25	50	
75	55	28	20	38	
50	40	20	10	25	

Table 17 : Distribution of marks for External and Internal for theory papers of PG courses

Table 18 : Distribution of Internal marks for theory papers of PG courses

S. No.	For Theory - PG courses	Distribution of Marks			
01.	CIA I	5 4 2			
02.	CIA II	5	4	2	
03.	CIA III	6	5	4	
04.	OBE Evaluation – Tool 01	3	2	1	
05.	OBE Evaluation – Tool 02	3	2	1	
06.	OBE Evaluation – Tool 03	3	3	-	
	TOTAL MARKS	25	20	10	

Table 19 : Distribution of marks for External and Internal for Practical papers of PG Courses

	External		Internal	Overall Passing Minimum	
Total Marks	Max. Marks	Passing Minimum for External alone	Max. Marks	for total marks (Internal + External)	
100	60	30	40	50	
75	45	23	30	38	
50	30	15	20	25	

S. No.	For PG Practical Courses	Distribution of Marks		
01.	Laboratory Performance - Assessment Tool 01*	5 4 3		
02.	Laboratory Performance - Assessment Tool 02*	5	4	3
03.	Laboratory Performance - Assessment Tool 03*	5	4	3
04.	Test 1 : During Mid semester	10	7	4
05.	Test 2 : As model test at the end of the semester	10	7	4
06.	Observation Note Book	5	4	3
Total Marks			30	20

Table 20 : Distribution of Internal marks for PG practical papers

Table 21 : Distribution of External marks for PG practical papers

S. No.	For - UG practical courses	Distribution of Marks			
1.	Experiment-I	20	15	10	
2.	Experiment-II	20	15	10	
3.	Record	10	10	5	
4.	Viva Voce	10	5	5	
	TOTAL MARKS	60	45	30	

Table 22 : Distribution of marks for Project and Viva Voce examinations and ContinuousInternal Assessments and passing minimum marks for the Project / Industrial Trainingcourses of PG programmes

	External		Internal	Overall Passing	
Total Marks	Max. Marks	Passing Minimum for External alone	Max. Marks	Minimum for Total Marks (Internal + External)	
250	150	75	100	125	
200	120	60	80	100	
150	90	45	60	75	
100	60	30	40	50	

S. No.	For - PG Project courses	Distribution of Marks			
1.	Review-I	20	15	10	10
2.	Review-II	20	15	10	10
3.	Review-III	20	15	10	10
4.	Document, Preparation and Implementation	25	20	15	10
5.	Research Paper Publication in Journals**	15	15	15	-
	TOTAL MARKS	100	80	60	40

Table 23 : Distribution of marks for the Continuous Internal assessment in PG Project / Industrial Training Courses

**Wherever it is not possible, an equivalent Assessment tool shall be prescribed by the Board Chairperson.

Table 24 : Distribution of marks for the External Examination in PG Project / Industrial Training courses

S. No.	For - PG Project courses	Distribution of Marks			
1.	Record Work and Presentation	100	80	60	40
2.	Viva Voce	50	40	30	20
	TOTAL MARKS	150	120	90	60

15. Passing Minimum:

A candidate who secures **not less than 50%** in the End Semester Examination and 50% marks in the External examination and Continuous Internal Assessment put together in any courses shall be declared to have passed the examination in the subject (Theory and Practical). Thus the minimum pass mark is 38 out of 75 in ESE and 50 marks out of 100 (CIA+ESE).

A candidate who passes the examination in all the courses shall be declared to have passed, the whole examination. Thus to obtain PG degree, a student should pass in all the courses prescribed in the concerned programme and also he / she should earn 94 credits.

16. Grade:

Range of Marks	Grade Point	Letter Grade	Description
90 - 100	9.0 - 10.0	0	OUTSTANDING
80 - 89	8.0 - 8.9	D+	EXCELLENT
75 – 79	7.5 - 7.9	D	DISTINCTION
70-74	7.0 - 7.4	A+	VERY GOOD
60 - 69	6.0 - 6.9	А	GOOD
50 - 59	5.0 - 5.9	В	AVERAGE
00-49	0.0	С	RE-APPEAR
ABSENT	0.0	AA	ABSENT

 Table 25 : Classification of Grade for PG Students based on the Percentage of marks

17. Grade Point Average (GPA)

Grade point average (GPA) is calculated for each part taking into account all the courses studied. Calculation of grade point average semester-wise and part-wise is as follows:

 $GPA = \frac{Sum of the multiplica tion of grade points by the credits of the courses}{Sum of the credits of the courses in a semester}$

$$\mathbf{GPA} = \frac{\sum_{i} (\mathbf{C}_{i} * \mathbf{G}_{i})}{\sum_{i} \mathbf{C}_{i}}$$

Where $C_i = Credit$ earned for course i in any semester.

 G_i = Grade points obtained for course i in any semester.

18. Cumulative Grade Point Average (CGPA)

For the entire program CGPA is calculated in the following manner.

$$\mathbf{CGPA} = \frac{\sum_{n} \sum_{i} C_{ni} * G_{ni}}{\sum_{n} \sum_{i} C_{ni}}$$

CGPA = Sum of the multiplica tion of grade points by the credits of the entire programme under each part

Sum of the Credits of the Courses of the entire programme under each part

19. Classification of CGPA

A candidate who has passed all the examinations under different parts is eligible for the following part wise computed final grades based on the range of CGPA.

Table 26 : Classification of performance of PG Students based on the Cumulative Grade
Points Average

ССРА	Grade	Classification of Final Result
9.5 - 10.0	O+	First Class Examplemy *
9.0 and above but below 9.5	0	First Class – Exemplary
8.5 and above but below 9.0	D++	
8.0 and above but below 8.5	D+	First Class with Distinction*
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	
6.5 and above but below 7.0	A+	First Class
6.0 and above but below 6.5	А	
5.5 and above but below 6.0	B+	Second Class
5.0 and above but below 5.5	В	Second Class

- a) A candidate who has passed all the subjects examinations in the first appearance within the prescribed duration of the PG programmes and secured a CGPA of 9 to 10 and equivalent grades "O" or "O+" in Core and Electives subjects shall be placed in the category of "First Class – Exemplary".
- b) A candidate who has passed all the subjects examinations in the first appearance within the prescribed duration of the PG programmes and secured a CGPA of 7.5 to 9 and equivalent grades "D" or "D+" or "D++" in Core and Electives subjects shall be placed in the category of "First Class with Distinction".
- c) A candidate who has passed all the subjects examinations of the PG programmes and secured a CGPA of 6 to 7.5 and equivalent grades "A" or "A+" or "A++" shall be declared to have passed in "First Class".
- d) A candidate who has passed all the subjects examination of the PG programmes and secured a CGPA of 5.0 to 6 and equivalent grades "B" or "B+" shall be declared to have passed in "Second Class".

20. Ranking

A candidate who qualifies for the PG Degree programme passing all the Examinations in the first attempt, within the minimum period prescribed for the programme from the date of admission to the programme and secures First or Second Class shall be eligible for ranking and such ranking will be confined to 10% of the total number of candidates qualified in that particular subject to a maximum of 10 ranks. However the Programmes will be considered for ranking only when there are minimum of 10 students completing that Programme. The improved marks will not be taken into consideration for ranking.

21. Improvement of Marks in the subjects already passed

Candidates desirous of improving the marks awarded in a passed subject in their first attempt shall reappear in the subsequent semester only. The improved marks shall be considered for classification but not for ranking. When there is no improvement, there shall not be any change in the original marks already awarded.

22. Conferment of the Degree

No candidate shall be eligible for conferment of the Degree unless he / she has undergone the prescribed programme of Study for a period of not less than four Semesters in the Institution or has been exempted there from in the manner prescribed and has passed the Examinations as have been prescribed.

23. Question Paper Pattern

A: Question Paper Pattern

Time: 3 Hours

Max Marks: 75

Knowledge Level	Q. No.	No. Section		Description
K1, K2, K3	1 – 10	A(Answer all the questions)	10 x 1 = 10	MCQ
K2, K3	11 – 15	B (Either or pattern)	5 x 5 = 25	Short Answers
K3, K4	16 – 21	C (Answer 3 out of 6)	3 x 10 = 30	Descriptive/ Detailed
K4, K5	22	D (Compulsory Question)	1 x 10= 10	Application Based/ HOTS

B. Question Paper Pattern

Max Marks: 55

Knowledge Level	Q. No.	Section	Marks	Description
K1, K2, K3	1 – 10	A(Answer all the questions)	10 x 1 = 10	MCQ
K2, K3	11 – 15	B (Either or pattern)	5 x 4 = 20	Short Answers
K3, K4	16 – 21	C (Answer 3 out of 6)	3 x 6 = 18	Descriptive/ Detailed
K4, K5	22	D (Compulsory Question)	1 x 7 = 7	Application Based/ HOTS

Time: 3 Hours

C. Question Paper Pattern –Advanced Learners Course

Time: 3 Hours

Max Marks: 50

Knowledge Level	Q. No.	Section	Marks	Description
K2, K3	1 – 5	A (Answer all the Questions)	$5 \times 4 = 20$	Short Answers
K3 , K4	6 – 10	B (Either or pattern)	$5 \times 6 = 30$	Descriptive/ Detailed

NOTE: The questions should be numbered continuously running through the Sections A, B and C.

Questions should be evenly distributed among the unit in the syllabus in all the sections of the question paper. While framing questions with internal choice the questions must be identified as (a) or (b). (e.g. 11. a or b). Further, the internal choice must be from the same unit.

The Controller of the Examinations shall arrange for the setting of question papers on the basis the syllabus and the pattern of question paper duly certified by the Chairpersons of the respective Board of Studies.

24. Revision of Regulations and Curriculum

The above Regulation and Scheme of Examinations will be in vogue without any change for a minimum period of three years from the date of approval of the Regulations. The Board may revise / amend / change the Regulations and Scheme of Examinations, if found necessary.

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SYLLABUS



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Scheme of Examination

M. Sc. Data Science Programme Code: MDT (Applicable to the students admitted during the year 2023-2024 onwards)

emester	ject Code		ion hours/week	of Examination	Examination Marks			Credits
S	Sut	Name of the Subject	Instructi	Duration	CIA	ESE	Total	
	23PGDTC101	Paper I : Data Analytics with R Programming	5	3	25	75	100	4
	23PGDTC102	Paper II : Advanced Database Management Systems	5	3	25	75	100	4
	23PGDTC103	Paper III: Descriptive Statistics	5	3	25	75	100	4
	23PGDTQ101	Practical I : Data Analytics with R Programming	5	3	40	60	100	4
Ι	23PGDTQ102	Practical II : Advanced Database Management Systems	5	3	40	60	100	4
	23PGDTE101 / 23PGDTE102 / 23PGDTE103	Elective Paper – I	5	3	25	75	100	4
			30				600	24
	23PGDTC204	Paper IV : Deep Learning for Data Science	5	3	25	75	100	4
	23PGDTC205	Paper V : Data Visualization Techniques using Tableau	5	3	25	75	100	4
	23PGDTC206	Paper VI: Linear Algebra	5	3	25	75	100	4
II	23PGDTQ203	Practical III : Deep Learning With Python	5	3	40	60	100	4
	23PGDTQ204	Practical IV : Data Visualization using Tableau	5	3	40	60	100	4
	23PGDTE204 / 23PGDTE205 / 23PGDTE206	Elective Paper – II	5	3	25	75	100	4
	23PGDTONLC	Online Course	-	-	-	-	-	-
			30				600	24

	23PGDTC307	Paper VII : Information Retrieval Techniques	4	3	25	75	100	4
	23PGDTC308	Paper VIII : Exploratory Data Analysis	4	3	25	75	100	4
	23PGDTC309	Paper IX: Data Privacy and Security	4	3	25	75	100	4
	23PGDTC310	Paper X : Probability and Inferential Statistics	5	3	25	75	100	4
III	23PGDTQ305	Practical V : Exploratory Data Analysis	4	3	40	60	100	4
	23PGDTQ306	Practical VI : Data Visualization using Power BI	5	3	40	60	100	4
	23PGDTE307 / 23PGDTE308 / 23PGDTE309	Elective Paper – III	4	3	25	75	100	4
	23PGDTCP301	Internship	-	-	50	-	50	2
	23PGDTONLC	Online Course	-	3	-	-	100	4
			30				850	34
IV/	23PGDTC411	Paper XI: IoT Analytics	5	3	25	75	100	4
1 V	23PGDTV401	Project Work and Viva - Voce	25	3	80	120	200	8
			30				300	12
]	Fotal	2350	94

Elective Paper - I Subjects			
Subject Code	Name of the Elective Subject		
23PGDTE101	Principles of Data Science		
23PGDTE102	Text Analytics		
23PGDTE103	Artificial Intelligence for Data Science		

Elective Paper - II Subjects				
Subject Code	Name of the Elective Subject			
23PGDTE204	Web Analytics			
23PGDTE205	Social Media Analytics			
23PGDTE206	Business Intelligence			

Elective Paper - III Subjects			
Subject Code Name of the Elective Subject			
23PGDTE307	Natural Language Processing		
23PGDTE308	Time Series Analysis		
23PGDTE309	Healthcare Analytics		

Self-Study	Paper	offered	by	Computer	Science	Department
			•			1

S.No.	Semester	Course Code	Course Title
1		23PGDSSS01	Cloud Computing
2		23PGDSSS02	Data Analysis using MS-Excel
3	II, III & IV	23PGDSSS03	Optimization Techniques
4		23PGDSSS04	Distributed Computing
5		23PGDSSS05	Data Mining

Chairman

Norming 1912023 BoS - Chairman Department of Computer Science Nehru Arts and Science College (Autonomous) Coimbatore - 641 105.



III

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Cour	se Code	Title								
23PG	DTC101	Paper I : Data	Analytics with R Prog	gramming						
Semes	ster: I	Credits: 4	CIA: 25 Marks	ESE:	75 Marks					
Course	Objective	To learn the concepts of Data	Analytics using R Prog	gramming						
Course	Category	Skill Development								
Develop	ment Needs	Global								
Course	Description	Study of roles in Data Science	e and Data Visualizatio	n in R.						
Course	Outcomes		Teaching Methods	Assessme	ent Methods					
CO 1	Understand datasets	ing about R environment and	Lecture / Video Lectures	Ass	ignment					
CO 2	Implement data manag	graphs and knowledge on basic ement	Lectures / Video Lessons	Se	eminar					
CO 3	Analyze va techniques graphs	rious advanced data managemen and implement more visualizatio	t Lectures / Video Lessons	(Quiz					
CO 4	Acquire kn linear mode	owledge about regression and els	Tutorial / Lecture	Se	eminar					
CO 5	Create appl clustering a	ications based on the concepts of nd classification	E Lecture / Video Lectures	(Quiz					
Offered	by Data S	cience	·	·						
Course	Content		Instructional Hours	/ Week : 5	5					
Unit		Description		Text Book	Chapters					
I	Introduction Working wi Input – W Understandi Annotating Objects	to R: Why use R – Obtainin th R – Packages – Batch Process orking with Large Datasets - ng datasets – Data Structure Datasets – Useful Functions fo	g and Installing R – ing – Using Output as -Creating a Dataset: es – Data Input – r Working with Data	1	1, 2					
Instruct	tional Hours	,			15					
Suggest	ed Learning	Methods : Video lectures								
II	 Working wi Adding Te Graphs. Bas New Variab Missing Val Merging I 	ext, Customized Axes, and Leger ext, Customized Axes, and Leger ic Data Management: A Workin les – Recording Variables – Ren ues – Date Values – Type Conve Datasets	Graphical Parameters nds – Combining g Example – Creating aming Variables – ersions – Sorting Data	1	3, 4					
			Instruction	al Hours	15					
Suggest	ed Learning	Methods : Case Study								
TTT	Advanced D Numerical a	ata Management: A Data Manag nd Character Functions – A Solu	gement Challenge – ition to the Data –	1	5, 6, 11					

Management Challenge – Control Flow – User written Functions – Aggregation and Reshaping. Basic Graphs: Bar Plots – Pie Charts

	– Histogram – Kernel Density Plots – Box Plots – Dot Plots.												
	Interm	ediate	Graphs	: Scatt	er Plot	s – Lir	he Char	ts – Co	rrgrams	s —			
	Mosaic	e Plots	_						-				
									Instr	uctional	Hours	s 1	5
Suggeste	ed Lear	ning N	Aethod	ls : Gr	oup D	iscussi	ion						
	Regres	sion: C	OLS Re	gressi	on - C	orrecti	ve Mea	sures –	Selecti	ng the			
	"best"	Regres	ssion N	lodel.	Genera	lized I	Linear N	Models	: Genera	alized			
	Linear	Model	s and t	he glm	n() fun	ction -	- Logist	ic Reg	ression	_			
IV	Poisson	n Regr	ession.	Princi	pal Co	mpone	ents and	Factor	r Analys	sis:	1	8, 1	3, 14
	Factor	Analys	sis in R	R – Prir	ncipal (Compo	onents –	- Explo	ratory F	Factor			
	Analysis												
			uctional	Hours	s 1	5							
Suggeste	ed Lear	ning N	Aethod	ls : As	signm	ent							
	Cluster	· Analy	vsis: Co	ommoi	1 Steps	in Clu	ister Ai	nalvsis	– Calcı	ilating			
	Distan	ces –	Hierard	chical	Cluste	r Anal	vsis –	Partiti	oning (Cluster			
V	Analysis – Avoiding Nonexistent Clusters. Classification: 1												16
	Preparing the Data – Decision Trees – Random Forest – Support												
	Vector Machines.												
Instructional Hours													5
Suggeste	ed Lear	ning N	Aethod	ls : La	borato	ory pra	actice						
			1							Tota	Hours	s 75	Hrs
Text Bo	nk		1. F	Robert	I. Kaba	acoff, '	'R in A	ction –	Data A	nalysis a	and Graj	phics w	ith
ICAT DO	Ĵĸ		F	R", Dre	amTec	h Pres	s, Seco	nd Edit	tion, 20	15.			
			1. V	.Bhuv	aneswa	ari, "D	ata Ana	lytics	with R -	- Step by	y Step",		
Referen	ce Book	KS	S	ciTech	Public	ations,	2016.						
			2. C	'Neil]	Rachel	Schut	t, "Doi	ng Dat	a Scien	ce", Shro	off Publi	ishers, 2	2013.
Web. Ul	RLs		https:	://www	v.geeks	forgee	ks.org/	data-ar	<u>alysis-</u>	<u>using-r/</u>			
				То	ols for	Assess	sment (25 Ma	rks)				
CIA	Ι	CI	A II	C	IA III	As	ssignme	ent	Semina	ar (Quiz	To	tal
5	5 5 6								3		3	2:	5
						Maj	pping						
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
C01	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	Μ	Н
CO2	Н	Н	Н	М	Н	М	Η	Н	Н	Н	Н	М	Н
CO3	H	H	H	М	H	M	Н	H	Н	Н	Н	М	H
CO4	H	H	H	M	H	M	H	H	H	H	H	M	H
LI Lich		H	H Low	М	Н	М	Н	H	Н	Н	Н	М	Н
		Course	e desig	ned by	7				Veri	fied by	Chairm	an	
		Dr.	N. Kav	vitha					Ι	Dr. N. K	avitha		

Cou	rse Code		Title									
23PG	DTC102	Paper II : Advanced	l Database Manager	ment Syste	ms							
Seme	ster: I	Credits: 4 CI	A: 25 Marks	ESE:	75 Marks							
Course	Objective	To learn the Concepts of Advan	ced Database Manag	ement Syst	ems							
Course	Category	Skill Development										
Develop	oment Needs	Global										
Course	Description	This course explores essential a	s well as advanced to	topics in database								
	_	design, implementation and cert	ain advanced concep	ts								
Course	Outcomes		Methods	Assessme	ent Methods							
CO 1	Understand model and	the concepts of DBMS, E-R enhanced E-R models	Lecture / Video Lectures	Ass	ignment							
CO 2	Acquire kn data norma	owledge on RDBMS concepts, lization and essentials of SQL	Lectures / Video Lessons	Se	eminar							
CO 3	Understand subqueries	ing of tables, views, indexes, and aggregate functions	Lectures / Video Lessons		Quiz							
CO 4	Understand management concepts	ing of joins, unions, transaction nt and concurrency control	l Tutorial / Lecture	Se	eminar							
CO 5	Acquire k recovery, databases, databases	nowledge of database backup distributed databases, temporal spatial databases, and multimedia	Quiz									
Offered	by Data S	cience										
Course	Content		Instructional Hours	s / Week : 5	5							
Unit		Description		Text Book	Chapters							
I	Introductio data and o database s managemen DBMS – component diagrams Relationshi attribute i specializati	ms: information – ata management – atabase – database – components of a rs. E-R modelling: relationships – E-R Enhanced Entity pclass entity types – generalization – tegorization.	1	1, 2								
Instruc	tional Hours				15							
II	Relational Relational terminolog manipulatio database co Pitfalls in r normal for	Methods : Video lectures Database Management Systery – the relational data structure on – Codd's rules. Relational onstraints – integrity constraints. I elational database design – first no m – third normal form – Boyce-C	ems – RDBMS e – relational data data integrity and Data normalization: rmal form – second odd normal form –	1	4, 5, 6							

Serializabili – The COM SAVEPOIN d Learning I Backup and Why Plan B Database Re Database Re Database S Failures. Cl Distributed Distributed Distributed Temporal D d Learning I ok RLs I Cl	MIT con T comm T comm Methods Recover Gackups - ecovery - Systems ient / So Databas Databas Databases Methods 1. 1. 2. https:/	mmand – The F nand s : Assignmen ery: Database E – Transaction L – Recovery Tea – Database erver Database ess: Homogene ess: Homogene ess: Homogene ses – Advantag s - Spatial Data s : Laboratory Alexis Leor Management 2009. Abraham Silb System Conce Raghu Ramak Systems", Mc '/www.javatpoi Tools for As	ROLLBACK c t Backups – Caus Logs – Importan chniques – Rec Recovery fro ous and Hetero ges of Distribu – Multimedia practice n & Mathew Systems", Vija perschatz, Hemn epts", McGraw crishnan, Johan cGraw-Hill, 200 nt.com/postgre sessment (25 M Assignment	Instruction Instruction Sees of Failures	nal Hours	s 15 16, 17 s 15 s 15 s 15 s 75 Hrs of Database b Limited, "Database on, 2008. anagement Total				
Serializabili – The COM SAVEPOIN d Learning I Backup and Why Plan B Database Re Database S Failures. Cl Distributed Distributed Temporal D d Learning I ok Re Books	MIT con T comm T comm Methods Recove ackups - ecovery - Systems ient / So Databas Databas Databas Databas Databas Databas Databas Databas Databas Databas Databas Databas	mmand – The F nand s : Assignmen ery: Database E – Transaction I – Recovery Ted – Database erver Database erver Database es: Homogene ess – Advantag s – Spatial Data s : Laboratory Alexis Leor Management 2009. Abraham Silb System Conce Raghu Ramak Systems", Mc	ROLLBACK c t Backups – Caus Logs – Importan chniques – Rec Recovery fro es: Benefits of ous and Hetero ges of Distribu – Multimedia practice h & Mathew Systems", Vija verschatz, Hemn epts", McGraw crishnan, Johan cGraw-Hill, 200 nt.com/postgre sessment (25 M	instruction inservention ince of Backups ince of Backups ince of Backups ince of Backups inservention inservention inservention instruction	nal Hours	s 15 16, 17 16, 17 s 15 s 75 Hrs of Database e Limited, "Database on, 2008. anagement				
Serializabili – The COM SAVEPOIN d Learning I Backup and Why Plan B Database Re Database Re Database S Failures. Cl Distributed Distributed Distributed Temporal D d Learning I ok Re Books	MIT con T comm T comm Methods Recove Gackups - ecovery - Systems ient / So Databas Databas Databas Databas Databas Databas Databas Databas Databas Databas Databas Databas Databas Databas Databas Databas Databas	mmand – The F nand s : Assignmen ery: Database E – Transaction L – Recovery Tea – Database erver Database es: Homogene ses – Advantag s - Spatial Data s : Laboratory Alexis Leor Management 2009. Abraham Silb System Conce Raghu Ramak Systems", Mc	ROLLBACK c t Backups – Caus Logs – Importan chniques – Rec Recovery fro ous and Hetero ges of Distribu – Multimedia practice h & Mathew Systems", Vija perschatz, Hemn epts", McGraw crishnan, Johan cGraw-Hill, 200 nt.com/postgre	instruction instruction is a ses of Failures - ince of Backups - covery in Multi - om Catastrophic C/S computing ogeneous ted Databases - Databases Instruction To vs Leon, "Es ay Nicole Impri cy F. Korth, S. S Hill Publication nes Gehrke, "Da 00. sql-tutorial	nal Hours	s 15 16, 17 16, 17 s 15 s 15 s 75 Hrs of Database e Limited, "Database on, 2008. unagement				
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Serializabili – The COM SAVEPOIN d Learning I Backup and Why Plan B Database Re Database S Failures. Cl Distributed Distributed Distributed Temporal D d Learning I	MIT com T comm Methods Recove ackups - ecovery - Systems ient / Se Databas Databas vatabases	mmand – The F nand s : Assignmen ery: Database E – Transaction L – Recovery Tea – Database erver Database es: Homogene ses – Advantag s – Spatial Data	ROLLBACK c t Backups – Caus Logs – Importan chniques – Rec Recovery fro ous and Hetero ges of Distribu – Multimedia practice	instruction instruction is ses of Failures - ince of Backups - covery in Multi - om Catastrophic C/S computing ogeneous ted Databases - Databases Instruction To ws. Leon. "Estimation To	nal Hours	s 15 16, 17 s 15 s 75 Hrs				
Serializabili – The COM SAVEPOIN d Learning I Backup and Why Plan B Database Re Database S Failures. Cl Distributed Distributed Distributed Temporal D d Learning I	MIT com T comm Methods Recove Cackups - ecovery - Systems ient / So Databas Databas Databases Methods	mmand – The F nand s : Assignmen ery: Database E – Transaction I – Recovery Tea – Database erver Database es: Homogene ses – Advantag 5 – Spatial Data	ROLLBACK c t Backups – Caus Logs – Importan chniques – Rec Recovery fro ous and Hetero ges of Distribu – Multimedia	iommand – The Instruction ses of Failures - nce of Backups - covery in Multi - om Catastrophic C/S computing ogeneous ted Databases - Databases Instruction	nal Hours	s 15 16, 17 s 15				
Serializabili – The COM SAVEPOIN d Learning I Backup and Why Plan B Database Re Database S Failures. Cl Distributed Distributed Temporal D	MIT com T comm Methods Recove ackups - ecovery - Systems ient / So Databas Databas atabases	mmand – The hand s : Assignmen ery: Database E – Transaction L – Recovery Tea – Database erver Database es: Homogene es: Homogene ses – Advantag s – Spatial Data	ROLLBACK c t Backups – Caus Logs – Importan chniques – Rec Recovery fro pous and Heter ges of Distribu – Multimedia	instruction instruction is of Failures - ince of Backups - iovery in Multi - iom Catastrophic C/S computing ogeneous ted Databases - Databases Instruction	nal Hours	s 15 16, 17 s 15				
Serializabili – The COM SAVEPOIN d Learning I Backup and Why Plan B Database Re Database S Failures. Cl Distributed Distributed Temporal D	MIT com T comm Methods Recove ackups - ecovery - Systems ient / Se Databas Databas satabases	mmand – The F nand s : Assignmen ery: Database E – Transaction L – Recovery Te – Database erver Database erver Database es: Homogene es – Advantag s – Spatial Data	ROLLBACK c t Backups – Caus Logs – Importan chniques – Rec Recovery fro res: Benefits of ous and Hetero ges of Distribu – Multimedia	iommand – The Instruction ses of Failures - nce of Backups - covery in Multi - om Catastrophic C/S computing ogeneous ted Databases - Databases	nal Hours	s 15 16, 17				
– The COM	MIT co	mmand – The	ROLLBACK c	ommand – The						
Joins and U Query Proc Dynamic S Transaction Properties	Unions - cessing - QL. Inc Manage – Trans ty – Rec	s : Group Disc – joins – unio – Embedded S dexing and Ha ement and Con saction States coverability – G	ussion ons. Programm SQL – Cursors ashing: Indexi currency Contr – Concurrer Concurrency Co	ing with SQL: s – Triggers – ng – Hashing. rol: Transaction ncy Control – ontrol Schemes	1	13, 15				
JT	Instructional Hours									
Tables, View and Subquer general rule () – MAX (– Insert state	ws and I ries – qu s – COU) and M ement –	and Indexes: tables – views – indexes. Queries s – queries – subqueries. Aggregate functions – - COUNT () and COUNT (*) – SUM () – AVG and MIN () – Insert, Update and Delete operations ient – Update statement – Delete statement Instructional Hours ethods : Group Discussion								
d Learning 1	Methods	s : Case Study								
				Instruction	nal Hours	s 15				
fourth norm Language (S types of SQ	nal form SQL): cl L comm	n – fifth nor naracteristics of ands - SQL ope	mal form. Stu f SQL – advan erators.	ructured Query tages of SQL –						
Ċ	fourth norr Language (S types of SQ I Learning I Tables, View and Subques general rule () – MAX (– Insert state	fourth normal forr Language (SQL): cl types of SQL comm I Learning Methods Tables, Views and I and Subqueries – qu general rules – COU () – MAX () and M – Insert statement –	fourth normal form – fifth nor Language (SQL): characteristics of types of SQL commands - SQL ope I Learning Methods : Case Study Tables, Views and Indexes: tables - and Subqueries – queries – subquer general rules – COUNT () and CO () – MAX () and MIN () – Insert, – Insert statement – Update statement	fourth normal form – fifth normal form. Str Language (SQL): characteristics of SQL – advan types of SQL commands - SQL operators. I Learning Methods : Case Study Tables, Views and Indexes: tables – views – index and Subqueries – queries – subqueries. Aggregate general rules – COUNT () and COUNT (*) – SUI () – MAX () and MIN () – Insert, Update and De – Insert statement – Update statement – Delete sta	fourth normal form – fifth normal form. Structured Query Language (SQL): characteristics of SQL – advantages of SQL – types of SQL commands - SQL operators. Instructio I Learning Methods : Case Study Tables, Views and Indexes: tables – views – indexes. Queries and Subqueries – queries – subqueries. Aggregate functions – general rules – COUNT () and COUNT (*) – SUM () – AVG () – MAX () and MIN () – Insert, Update and Delete operations – Insert statement – Update statement – Delete statement Instructio I Learning Methods : Group Discussion	fourth normal form – fifth normal form. Structured Query Language (SQL): characteristics of SQL – advantages of SQL – types of SQL commands - SQL operators. Instructional Hours I Learning Methods : Case Study Tables, Views and Indexes: tables – views – indexes. Queries and Subqueries – queries – subqueries. Aggregate functions – general rules – COUNT () and COUNT (*) – SUM () – AVG () – MAX () and MIN () – Insert, Update and Delete operations – Insert statement – Update statement – Delete statement Instructional Hours I Learning Methods : Group Discussion				

	Mapping												
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO2	Н	Н	Н	Μ	Н	М	Н	Н	Н	Н	Н	М	Н
CO3	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO4	Н	Н	Н	Μ	Н	М	Н	Н	Н	Н	Н	М	Н
CO5	Н	Н	Н	Μ	Н	М	Н	Н	Н	Н	Н	М	Н
H-High;	M-Med	lium; L	L-Low										
		Course	e desig	ned by	y				Veri	fied by (Chairm	an	
Dr. B. Narasimhan									Ι	Dr. N. K	avitha		

Co	urse Code	Title								
23	PGDTC103	Pa	aper III :	Descriptive S	tatist	ics				
S	Semester: I	Credits: 4	CIA	: 25 Marks		ESE:75	5 Marks			
Cour	se Objective	To Understand the basic used for data analysis.	principles	of statistical r	netho	ods and pro	ocedures			
Cour	se Category	Employability								
Develo	pment Needs	Global								
Course	e Description	This course helps in ac visualizing data; making effectively communication	cquiring, data-driv ng results	cleaning, anal en inferences	yzing and d	, explorir ecisions;	ng, and and			
Course	Outcomes			Teaching Methods		Assessme	nt Methods			
CO 1	To visualize t	he data		Lecture		Group D	iscussion			
CO 2	To underst correlation an	and the difference	between	Lecture		Quiz				
CO 3	To compare the time	he data between two period	ds of	Video Lesso	ons	Seminar				
CO 4	To ensure the	reliability of a sample		Tutorial / Video Lesso	ons	Seminar				
CO 5	To understan	d various parametric test es	ts for	Video Lesso	ons	Assignm	ient			
Offered	l by Mathem	atics								
Course	Content			Instructiona	l Hou	irs / Weel	k : 5			
Unit		Description				Text Book	Chapters			
I	Introduction: limitations of Classification Construction Diagrammati diagram and frequency Dis frequency cur	Meaning- Definition- Natu statistics - Types of data: p of data: Meaning and T of Tables with one or mo c representations: - Line sub-divided bar diagram. (stribution, Frequency polygo ves, Time series.	ure and ob primary an Types. Ta pre factors diagram, Graphical pn, histogr	oject of Statisti d secondary da bulation of da of classification bar diagram, p representation am, ogives,	cs, ta, ta: on. oie ns:	1	1,2,4,6,7,8			
				Instruct	tiona	l Hours	15			
Suggest	ted Learning N	Iethods: Seminar	Trees	Vorl Derm						
п	Coefficient of c correlation – Sp Regression – It and Y on X – re error of Estimat	orrelation, Properties, Interpreterments, Interpreterments, Interpreterments, Interpreterments, Interpreterments, Introduction - Definition – regression equation in terms of e.	retation of erits and d gression eq f correlatio	Correlation, Ra emerits. Juations of X on n table – standa	nk nk Y urd	1	12,13			
~				Instruct	tional	l Hours	15			
Suggest	Analysis of The	lethods: Problem solving	Modele	Component	of					
III	Analysis of Th Time Series - S Irregular Variat Secular Trend Average Methor Ratio to moving	Secular trend – Seasonal Var ion - Preparation of Data fo – Graphic Method – Semi d – Method of Simple Avera g Average Method.	riation – C riation – C or analysis Average age – Ratio	yclical Variatic – Measuremen Method – Mov to trend Metho	s of on – t of /ing od –	1	15			
		-		Instruct	tional	I Hours	15			

Suggest	ed Lea	rning	Metho	ls :Gro	oup D	iscussi	on															
	Sam	pling I	Design:	Introd	uction	- Cens	ses met	hod, Sa	ample m	nethod												
	- Ess	entials	of Sam	pling –	Meth	ods of S	Sampli	ng – Ra	andom													
IV	Sam	oling a	nd Non	Rando	m sam	pling –	Statist	tical La	ws –		1		5									
	Statis	stical e	rror – B	iased a	nd Un	biased	errors	– Meas	uremen	t of												
	error	s -Test	of relia	bility o	of Sam	ples.																
·									Instr	uctiona	l Hours	5	15									
Suggest	ed Lea	rning	Metho	ls :Vio	deo Pr	resenta	tion aı	nd Assi	ignment	t												
	Statis	stical I	Decision	sion Theory: Hypothesis Testing- Parametric Tests:																		
	Tests	of sign	nificance	for sn	nall sa	mples -	- Assur	nption	of Norm	ality –												
V	Stude	nt's t-	distribu	tion –	Test t	he sign	111cance	e of me	ean of r	andom	2	3										
	samp		Fit E to	- F test and analysis of variance.																		
	goodi	less of	s of in – r test and analysis of variance.																			
Suggest	Instructional Hours 15 red Learning Methods : Problem solving																					
Suggesu	ed Lea	Total Hours 75																				
			1	DCN	notico S	$\frac{5}{73}$	87 87															
			1. K.S.N. Pillai, Bagavatni, Statistics Theory and Practice , S.Chand & Company,8 th Edition, 2016																			
		Company,8 ^{ar} Edition, 2016 Unit- I: Chapter 1 - Pg. No : 1-11 ; Chapter 2 - Pg. No : 17-18																				
		Chapter 4 - Pg. No : $27-37$; Chapter 6 - Pg. No : $50-80$																				
			Chapter 7 - Pg. No : 81-91; Chapter 8 - Pg. No : 100-113																			
Text Bo	oks			Unit- 1	II: Cha	pter 12	- Pg. N	o : 396-	420 ; Ch	apter 13	- Pg. No	: 465-52	25									
				Unit- l	III: Cha	apter 15	- Pg. N	lo : 591	- 602,61	5- 621,62	23-625.											
			2	Unit-	IV: Ch	apter 5 ·	- Pg. No	0:38-	49	1 4	cth T 1	2021										
			2.	Statisti	cal Met	thods, S.	P. Gupt	a, Sultan	\cdot 2 2 2 2	nd sons, 4	-6^{m} Edition	n,2021										
				Unit-	Ch	apter 4-	Pg. No	2 + 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1	4.17: Ch	apter 5-	Pg. No :	5.2 - 5.3	37									
			Ch	arles	E. Ro	oberts.	Jr. "	[ntrodu	ction to	o Math	ematica	Proo	fs A									
Referen	ce Boo	oks	Tra	nsitior	1 to 1	Advanc	ed M	athema	tics" D	enny C	Bulick,	4th Ed	ition.									
			Pu	blished	l by Pe	earson,	2018				,		,									
			Rela	nted O	nline(Conten	ts [M0	DOC, 8	SWAYA	M, NP	ΓEL, W	ebsites	etc.]									
Web. Ul	RLs		1. <u>h</u>	ttps://yo	utu.be/	L3wQw(<u>)wva3g</u>	(Sampli	ng Distrib	ution)												
			$\frac{2}{3}$	ttps://yo ttps://wy	outu.be/	<u>F9lk8tlk</u> greatlear	<u>DXI(</u> Standard	atistical m/blog/ji	Hypothes	18) statistics	an-overvi	ew/										
			<u>.</u>	<u>арыл и</u> То	ols for	· Asses	sment	(25 Ma	rks)	statistics		<u></u>										
CIA	Ι	CIA	II	CIA II	I	Assign	ment	Sen	ninar	Case	Study	To	otal									
5	$\frac{11}{5} \frac{11}{5} \frac{11}{6} \frac{11}{6} $										3	-	25									
-						Ma	pping															
CO \PO	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PSO1	PSO2	PSO3	PSO4	PSO5									
CO1	Н	Н	Н	М	М	М	М	Н	М	М	М	М	Н									
CO2	Н	Н	М	М	М	М	М	М	М	М	М	М	М									
CO3	Н	Н	Н	М	М	H	М	Н	М	М	Н	М	Н									
CO4	Н	M	М	M	Μ	Μ	M	M	M	M	М	М	М									
CO5	Н	Η	М	М	М	М	М	М	М	М	М	М	М									
H-High;	M-Me	dium;	L-Low							I												
		Cours	se desig	ned by	7				Veri	fied by (Chairm	an										
	г	от с	Thore days						, стп		ovith a											
	L	л. 1. С	nandra	pusnpa	111					JT. N. K	avitha		Dr. T. Chandrapushpam Dr. N. Kavitha									

Cours	se Code			Title					
23P0	GDTQ101	Practical	I:Data A	Analytics with R	Program	nming			
Ser	nester: I	Credits: 4	CIA	A:40 Marks	ES	E: 60 Marks			
Course (Objective	To learn the Concepts	of Data A	nalytics with R I	Programmi	ing			
Course (Category	Skill Development							
Develop	ment Needs	Global							
Course I	Description	Study of roles in data s	roles in data science and Data Visualization using R.						
Course (Outcomes			Teaching Meth	ods Asse	essment Methods			
CO 1	Implement	the basic concepts	of R	Demonstrati	Assignment				
	Understand	ng the Data Visualization in	n R			~ .			
CO 2	Programmi	ng		Demonstrati	on	Seminar			
CO 3	Perform Da	ta Manipulations		Demonstrati	Quiz				
CO 4	Implement	the concept of Regression	n using R	Demonstrati	Seminar				
CO 5	Create pro problems	ogram for solving rea	al world	Demonstration Quiz					
Offered	by Data S	cience							
Course (Content]	Instructional Ho	ours / Wee	ek : 5			
Unit			Descrij	ption					
1.	Create a b functions	asics of R programming s	such as dat	ta types, operator	rs, matrice	s, lists and			
2.	Write a R	Program to perform some	e Built-in	mathematical fur	nctions				
3.	Write a R	program to perform Grap	hs						
4.	Calculate a. Graphic b. Dealing	exploratory data analysis al representation of varial with Continuous and Cat	in R bles tegorical v	variables					
5.	Data mani a. Manipu b. Mergin c. Reshapi	pulation in R Ilating in rows and colum g datasets ng data	ns (Filteri	ng and sorting)					
6.	Write a R	Program for Reading data	a from csv	y files					
7.	Write a R	program to Read data from	m Excel f	iles					
8.	Solve real	-world problem using mad	chine lear	ning algorithm o	f Linear (N	Multiple)			
9.	Solve the	problem using Decision T	ree for the	e given dataset					
10.	Cluster the	e target variable using the	K-means	clustering algori	thm				
11.	Calculate	the Radom Forest to find	the optim	um value of mod	el parame	ters			
12.	12. Solve the classification problem using Logistic Regression for the given datase								
					Total Ho	ours 75 Hrs.			

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Text Boo	k		1.	Nina Z Progra	Zumel ummin	, John] g",201	Mount, 4	"Pract	ical Dat	ta Scien	ce with	R	
Referenc	e Book	S	1. V P 2. H M	Bhu ublicat ladley Iedia, 2	vanesv ions, 2 Wickh 2016.	vari, I 2016. 1am, Ga	Data A	nalytic rolemu	s with nd, "R	R Pro	ogramn Scienc	ning, Sci [*] æ", O'Re	Tech eilly
Web. UR	Ls		<u>https</u>	://www	v.w3sc	hools.c	<u>com/r/</u>						
Tools for Assessment (40 Marks)													
Labora Perforn – Applica Log	Labor Perfron Prog Creat	Laboratory Laboratory erfromance – Performance – Program Program Creativity Debugging				Test 1	- Tes	t - 2	Observ Note F	ation Book			
5				5			5		10	1	0	5	
						Maj	pping						
				1									DCO
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO \ PO CO1	РО1 Н	РО2 Н	РОЗ Н	РО4 М	РО5 Н	РО6 М	РО7 Н	РО8 Н	РSO1 Н	РЅО2 Н	РSO3 Н	PSO4 M	РSO 5 Н
CO \ PO CO1 CO2	РО1 Н Н	РО2 Н Н	РОЗ Н Н	PO4 M M	РО5 Н Н	PO6 M M	РО7 Н Н	РО8 Н Н	РSO1 Н Н	РSO2 Н Н	РSO3 Н Н	PSO4 M M	Р80 5 Н Н
CO \ PO CO1 CO2 CO3	РО1 Н Н Н	РО2 Н Н	PO3 H H H H	PO4 M M M	PO5 H H H	PO6 M M M	РО7 Н Н Н	РО8 Н Н Н	РSO1 Н Н Н	РSO2 Н Н Н	PSO3 H H H	PSO4 M M M	Р80 5 Н Н Н
CO\PO CO1 CO2 CO3 CO4	РО1 Н Н Н	РО2 Н Н Н	PO3 H H H H	PO4 M M M M	PO5 H H H H	PO6MMMM	РО7 Н Н Н	РО8 Н Н Н	PSO1 H H H H H	РSO2 Н Н Н Н	РSO3 Н Н Н	PSO4 M M M M	PSO 5 H H H H H
CO \ PO CO1 CO2 CO3 CO4 CO5	PO1 H H H H H	PO2 H H H H	PO3 H H H H H H	PO4 M M M M M	PO5 H H H H H H	PO6 M M M M M M	P07 H H H H	PO8 H H H H H H	PSO1 H H H H	PSO2 H H H H H H H	PSO3 H H H H H	PSO4MMMMM	PSO 5 H H H H H H H H H
CO \ PO CO1 CO2 CO3 CO4 CO5 H-High; I	PO1 H H H H H M-Med	PO2 H H H H ium;	PO3 H H H H H L-Low	PO4 M M M M M	PO5 H H H H H H	PO6 M M M M M M	PO7 H H H H	PO8 H H H H H	PSO1 H H H H	PSO2 H H H H H H	PSO3 H H H H	PSO4MMMMM	РSО 5 Н Н Н Н Н
CO\PO CO1 CO2 CO3 CO4 CO5 H-High; I	PO1 H H H H M-Med	PO2 H H H H ium;	PO3 H H H H L-Low	PO4 M M M M design	PO5 H H H H H H ed by	PO6 M M M M M	PO7 H H H H	PO8 H H H H	PSO1 H H H H	PSO2 H H H H H	PSO3 H H H H H	PSO4 M M M M M M	PSO 5 H H H H H H

Cou	rse Code			Title							
23P	GDTQ102	Practical II :	Advanced	Database Manage	ment Systems						
Se	emester: I	Credits: 4	CIA	A: 40 Marks	ESE: 60 Marks						
Course	Objective	Learn to implement ad	vanced dat	abase management	using PostgreSQL						
Course	Category	Skill Development									
Develop	oment Needs	Global									
Course	Description	This course develops s	skills in wo	orking with databas	e schema, concurrency						
		PostgreSQL	ggers, bac	kup, restore, trans	action management in						
Course	Outcomes			Teaching Methods	Assessment Methods						
CO 1	Implement	database schema and use	functions	Lecture / Video	Assignment						
CO 2	Apply con	ncurrency control and sto	ored	Lectures / Video	Seminar						
	Perform trie	over and perform logical h	hackun	Lessons							
CO 3	operations	gger and perform toglear (баскар	Lessons	Quiz						
CO 4	Conduct	sorting and file	handling	Tutorial /	Seminar						
CO 5	Implement	transaction management	and also	Lecture / Video	Quia						
05	work with	arge objects		Lectures	Quiz						
Offered	by Data S	cience									
Course	Content		Ir	nstructional Hours	s / Week: 5						
Unit			Descripti	ion							
1.	Database table. Us	e schema for ticket bookin e various functions, sub q	g system. I Jueries and	nsert sufficient nur SELECT statemen	nber of records in each ts						
2.	Database	schema for library manage	gement sys	tem. Insert sufficie	nt number of records in						
2	Aggregat	ing data using functions l	like COUN	T, AVG, MAX, an	d MIN to calculate						
5.	various r	netrics	<u> </u>								
4.	Concurre	ency control using Postgre	SQL. Show	wease with a real tr	me scenario						
5.	Working	with stored procedures in	1 PostgreS(2L							
6.	Create a	table, insert sufficient rec	ords, and in	nplement a trigger	in PostgreSQL						
7.	Impleme	nt B-Tree index in Postgr	eSQL								
8.	Create a	logical backup using pg_c	dump. The	n, perform restoring	g from the backup						
9.	Sorting in	n PostgreSQL									
10.	File hand	lling in PostgreSQL									
11.	Working	with large objects in Post	tgreSQL								
12.	Transacti	on management in Postgr	reSQL								
					Total Hours: 75						

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Text Boo	ok		1.	Alexis Systen	Leon & ns", Vij	& Math ay Nic	news L cole Im	eon, " prints	Essen Priva	tials of te Limi	Databa ted, 20	ise Manage 12.	ment
Referenc	e Bool	ζS	1. 2.	Abrah Syster Muke BPB I	am Sill mConce sh Negi Publicat	oerscha epts", I i, "Fun tions, 2	atz, He McGra damen 2010.	emry F w Hill ntals of	'. Kort l Publ: f Data	h, S. Su ication, base M	idarsha 2000. anagen	n, "Databas nent System	se 1",
Web. UR	RLs		https	<u>s://ww</u>	<u>w.java</u> t	t <mark>point.</mark>	<u>com/p</u>	ostgre	esgl-ti	<u>utorial</u>			
Tools for Assessment (40 Marks)													
Laboratory PerformanceLa PerApplication LogicC		borato forma Progra reativit	ory nce m ty	Lal Perfo Pi De	borato orman rogran buggii	ory ice – n ng	Tes	t - 1	Tes	t - 2	Observa Note Bo	tion ook	
5			5			5 10 10			0	5			
						Map	ping						
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO	1 PS 02	PSO3	PSO4	PS O5
CO1	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO2	Н	Η	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO3	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO4	Н	Н	Н	Μ	Н	Μ	Н	Н	Н	Н	Н	М	Н
CO5	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
H-High; l	M-Mec	lium; L	L-Low										
Course o	design	ed by	Verified by Chairman										
000100	0				Dr. N. Kavitha								

Cour	rse Code	Title								
23PG	DTE101	Elective Paper I A: Principles of Data Science								
Semeste	er: I	Credits: 4 CIA:	Credits: 4 CIA: 25 Marks							
Course Objective		To understand the principles of Data Science								
Course	Category	Entrepreneurship								
Development		Global								
Needs Course Description		Data Science Principles gives you an overview of data science with a code- and math-free introduction to prediction, causality, data wrangling, privacy, and ethics.								
Course	Outcomes		Assessmer	nt Methods						
CO 1	Understa various c	and Data Sources, Data from Iomains	Lecture	Group	Discussion					
CO 2	Learn Bi tradition Vs to Da	g Data Characteristics, Limitation of al Approaches and models. Map Big ta Domains	Lecture	Quiz						
CO 3	Exposure framewo models -	e to Big Data Processing platform, rks, Hadoop, Spark, storage - Hbase	Video Lessons	Semin	ar					
CO 4	Analyze Intellige	the Role of Big Data and Artificial nce – Ethics – AI Applications	Tutorial / Video Lessons	Seminar						
CO 5	Interpret Characte Model at	various domains of Big Data pristics, Platform, Programming nd many more	Video Lessons	Assignment						
Offered	l by Data S	Science								
Course	Content	In	structional Hours	/ Week :5						
Unit		Description		Text Book	Chapters					
I	Introduction Big Data in Time Line – Perspective Data to Dat of Data: Nu Data – Dat Structured a Discipline Programmin Analytics R	n to Data Evolution & Sources: Industry 4.0 - Data Evolution: Data - ICT Advancement - a Perspective – - IT Components - Business Process a Science – Understanding data: Intro- meric – Categorical – Graphical – Hi a Classification - Data Formats: St and Un-Structured – Data Science: – Data Science vs Statistics – ng Language – Database - Machine I elation: Data Science, Analytics, Big I	ta Development Data Growth - a s – Landscape - oduction – Type gh Dimensional ructured, Semi- Data Science A Mathematics - Learning - Data Data Analytics	1	1,2					
a	17 •		Instruction	nal Hours	15					
Suggest	ea Learning	ivietnous: i utorial								

	Big Data Towards Data Science:		
II	Big Data: Introduction To Big Data: - Evolution – Data as Economy - What is Big Data – Sources of Big Data. – Big Data Myths - Characteristics of Big Data – Big Data Use cases - Big data-Challenges of Conventional Systems – Data Processing Models – Limitation of Conventional Data Processing Approaches -Data Discovery-Traditional Approach, Big Data Technology: Big Data Exploration - Data Augmentation– Operational Analysis – 360 View of Customers – Security and Intelligence – Data Analytics – Classification – Descriptive – Diagnostic – Predictive – Prescriptive – Augmented – Pervasive Analytics- Data Science Components: Data Engineering, Data Analytics-Methods and Algorithm, Data Visualization – P's of	1	4,5
	Data Science – Process – People – Platform	nal Hours	15
Sugges	ted Learning Methods: Group Discussion	100115	10
	Big Data Frame work and Components:		
ш	Big Data Technologies - Hadoop: Basic Concepts - An Overview of Hadoop - The Hadoop Distributed File System - Anatomy of a Hadoop Cluster - Hadoop Ecosystem Components. SPARK – in Architecture – SPARK Advantages - HBASE: HBase Architecture - HBase API - Managing large datasets with HBase- Map Reduce Framework Phases-Map Reduce Input and Output Formats - Advanced Concepts - Sample Applications – Combiner – Joining datasets in Map reduce jobs – Map-side join – Reduce- Side join - Map reduce – customization	2	3,4
	Side Join - Map reduce – customization	nal Hours	15
Sugges	ted Learning Methods: Group Discussion		10
249905	Big Data and AI: Roles and Skills:		
IV	AI: Cognitive Computing: Learning Perceptions – Terminologies – Machine Learning – Neural Networks – Deep Learning – NLP – Speech Processing – Big Data and AI – Ethics in AI Research - Advanced Applications – AI Myths – Data Science Roles Data Scientist, Data Architect, Data Analyst – Machine Learning Engineer- Skills	2	5,6
	Instruction	nal Hours	15
Sugges	ted Learning Methods :Video Presentation		
V	Data Science Use cases:Data Science & Big Data Use Cases Specifications and Discussion– Data Sources Identification –Data Types –Data Classification –Data Characteristics of Big V's – Data Science P's – Big DataFrameworks– Data Analytics Classification– Applications of AI:Domains: Customer Insights – Behavioral Analysis – Marketing –Retails – Insurance – Risk and Security–Healthcare – SupplyChain Logistics	3	4,5
	Instruction	nal Hours	15
	То	tal Hours	75 Hrs.

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Text Bo	oks		 I.V.Bhuvaneswari, T. Devi, "Big Data Analytics: A Practitioner's Approach", Sci-Tech Publications, 2016. Han Hu, YonggangWen, Tat- Seng, Chua, XuelongLi, "Toward Scalable Systems for Big Data", 2017. Seema Acharya, Subhashini Chellappan, "Big Data and Analytics", Wiley Publication, 2016. 											
Reference Books1. Field Cady, "The Data Science Handbook2. Hu Hana Fer, "Data Science Primer", SC								lbook", J ', SCD P	John Wiley & Sons, 2017. Publications, 2002.					
Web. UI	RLs		https://t	ouiltin.	com/da	ata-sci	ence							
Tools for Assessment (25 Marks)														
CIA I CIA II CIA III Assi								ent	Semina	ır	Quiz	Total		
5	5 5				6		3		3		3		25	
Mapping														
CO \ PO	PO1	PO 2	PO3	PO4	PO5	PO6	P07	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO\PO CO1	РО1 Н	РО 2 Н	РОЗ Н	PO4 M	РО5 Н	РО6 М	РО7 Н	РО8 Н	PSO1 H	PSO2 H	РSO3 Н	PSO4 M	РЅО5 Н	
CO\PO CO1 CO2	РО1 Н Н	РО 2 Н Н	РОЗ Н Н	PO4 M M	РО5 Н Н	РО6 М М	РО7 Н Н	РО8 Н Н	PSO1 H H	РSO2 Н Н	РSO3 Н Н	PSO4 M M	РSO5 Н Н	
CO\PO CO1 CO2 CO3	РО1 Н Н	РО 2 Н Н Н	РОЗ Н Н Н	PO4 M M M	РО5 Н Н	РО6 М М	РО7 Н Н Н	РО8 Н Н	PSO1 H H H H	РSO2 Н Н Н	PSO3 H H H H	PSO4 M M M	РSO5 Н Н	
CO\PO CO1 CO2 CO3 CO4	РО1 Н Н Н	РО 2 Н Н Н	РО3 Н Н Н	PO4 M M M M	РО5 Н Н Н	РО6 М М М	РО7 Н Н Н Н	РО8 Н Н Н Н	PSO1 H H H H H	РSO2 Н Н Н	PSO3 H H H H H	PSO4 M M M M	РSO5 Н Н Н Н	
CO\PO CO1 CO2 CO3 CO4 CO5	PO1 H H H H H	PO 2 H H H H H H H H	РО3 Н Н Н Н	PO4 M M M M M	PO5 H H H H	PO6 M M M M M	РО7 Н Н Н Н Н	PO8 H H H H H	PSO1 H H H H H H H	РSO2 Н Н Н Н	PSO3 H H H H H H H	PSO4 M M M M M	РSO5 Н Н Н Н Н	
CO\PO CO1 CO2 CO3 CO4 CO5 H-High;	PO1 H H H H H	PO 2 H H H H H dium;	PO3 H H H H H L-Low	PO4 M M M M M	PO5 H H H H H	PO6 M M M M	РО7 Н Н Н Н	PO8 H H H H	PSO1 H H H H H H H	РSO2 Н Н Н Н	PSO3 H H H H H H H	PSO4 M M M M	PSO5 H H H H	
CO \ PO CO1 CO2 CO3 CO4 CO5 H-High;	РО1 Н Н Н М-Ме	PO 2 H H H H dium;	PO3 H H H H L-Low	PO4 M M M M M	PO5 H H H H H	PO6 M M M M	РО7 Н Н Н Н	PO8 H H H H H H H H	PSO1 H H H H H H H Ver	PSO2 H H H H	PSO3 H H H H H H H H H H H H H H H H H H H	PSO4 M M M M M	PSO5 H H H H H H	

Cou	rse Code	Title									
23P	GDTE102	Elective Paper I B: Text Analytics									
Sem	ester: I	Credits: 4	Cl	A: 25 Marks	ESE:7	5 Marks					
Course	Objective	 To understand the text mining and NLP techniques To understand and apply probabilistic models, clustering and classification for text analytics. To understand and apply text analytics approaches in different domains 									
Course	Category	Entrepreneurship									
Develop	oment Needs	Global									
Course Description Text analysis helps businesses analyze huge quantities of text-based in a scalable, consistent and unbiased manner.											
Course	Outcomes			Teaching Methods	Assessme	ent Methods					
CO 1	Understar preproces	nd the text mining and ssing techniques	text	Lecture	Grou	p Discussion					
CO 2	Understan informati	nd the concepts of text mining on retrieval and extraction	in	Lecture	Quiz						
CO 3	Apply the and class	e probabilistic models, clusteri ification for text analytics	Video Lessons	Semi	Seminar						
CO 4	To apply different	the text analytics approaches i domains	Tutorial / Video Lessons	Semi	Seminar						
CO 5	Design a text data	text analytic framework to ana for domain specific application	Video Lessons	Assig	Assignment						
Offered	by Data S	science									
Course	Content		Iı	nstructional Hour	s / Week :5						
Unit		Description			Text Book	Chapters					
I	I Text Preprocessing and Wrangling - Removing HTML Tags - Text Tokenization - Removing Accented Characters - Expanding Contractions - Removing Special Characters - Case Conversions 1 I - Text Correction - Stemming - Lemmatization - Removing Stopwords - Building a Text Normalizer 1										
				Instructio	nal Hours	15					
Suggest	ed Learning	Methods: Tutorial	Ŧ	· 11' > Y							
II	Understanding Text Syntax and Structure - Installing Necessary Dependencies - Important Machine Learning Concepts - Parts of Speech Tagging - Shallow Parsing or Chunking - Dependency Parsing - Constituency Parsing1										
				Instructio	nal Hours	15					
Suggest	ed Learning	Methods: Group Discussion	n								
III	Understandin Our Text Co of Words M Extracting F Topic Mode	ng Text Data - Building Tex orpus - Traditional Feature E Iodel - Bag of N-Grams M Teatures for New Documents ls.	t Corp Enginee Iodel - - Docu	us - Preprocessing ering Models: Bag TF-IDF Model - ument Similarity -	1	4					
	1			Instructio	nal Hours	15					
Suggest	ed Learning	Methods: Group Discussion	n								

IV	Advanced Feature Engineering Models: Word2Vec Model - Robust Word2Vec Models with Gensim - Applying Word2Vec Features for Machine Learning Tasks - The GloVe Model - 1 Applying GloVe Features for Machine Learning Tasks - The FastText Model1												4
I		10 11 10 0							Inst	ruction	al Hour	s	15
Suggested Learning Methods : Video Presentation													
V	Text Classification: Formal Definition - Major Text ClassificationVariants. Automated Text Classification: Formal Definition - TextClassification Task Variants. Text Classification Blue Print - DataRetrieval - Data Preprocessing and Normalization - Building Trainand Test Datasets											5	
									Inst	ruction	al Hour	s	15
Suggest	ed Lear	rning N	Aethod	ls : Vio	deo Pr	esenta	tion						
			1							Tot	al Hour	s 75	Hrs.
Text Book1. Dipanjan Sarkar, "Text Analytics with Python", APress, Second Edition,2019.													
Reference Books1. Steven Struhl, "Practical Text Analytics", Kogan Page, 2015.2. Jens Albrecht, Sidharth Ramachandran, Christian Winkler, "Bluepri for Text Analytics Using Python", O'Reilly Media, 2010.										eprints			
Web. URLs https://www.listendata.com/2015/09/text-mining-basics.html													
			1	То	ols for	Asses	sment	(25 N	(arks)				
CIA	I	CI	A II	C	IA III	As	ssignm	ent	Semina	ar	Quiz	Total	
	5		5		6		3	3 3			3	25	
						Ma	pping						
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO	8 PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO2	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO3	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO4	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO5	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
H-High;	M-Mec	lium; L	L-Low				1	<u> </u>	I	1	I	1	1
		Course	e desig	ned by	7				Veri	fied by	Chairm	an	
Dr. B. Narasimhan									Dr. N. F	Kavitha			
Cour	se Code	Title											
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23P0	GDTE103	Elective Paper I C: Art	ificial Intelligence for	[.] Data Scie	ence								
Sem	ester: I	Credits: 4	CIA: 25 Marks	ESE: 7	5 Marks								
Course	Objective	To understand Artificial Intelligen	nce theoretical aspects	that suits f	for data								
G	<u> </u>	science											
Course	Category	Entrepreneurship											
Develop Needs	ment	Global											
Course		This course emphasizes various	artificial intelligence	techniques	that can be								
Descrip	tion	applied to data science and analyt	ics										
Course	Outcomes		Teaching Methods	Assessme	ent Methods								
CO 1	Understa intelliger	and the concepts of artificial nee and problem solving	Lecture	Grou	p Discussion								
CO 2	Understa problems	and the concepts of optimization s and stochastic games	Lecture	Quiz									
CO 3	Apply th reasonin	ne knowledge representation and g systems	Video Lessons	Semi	nar								
CO 4	To apply applicati	software agents in real world ons	Tutorial / Video Lessons	Semi	nar								
CO 5	To obtai	n exposure on AI applications	Video Lessons	Assig	nment								
Offered	by Data	Science											
Course	Content		Instructional Hours	/ Week : 5	5								
Unit		Description		Text Book	Chapters								
1	T 1 1												
Ι	Characteria – Problem	on–Definition – Future of Artificia stics of Intelligent Agents–Typical Solving Approach to Typical AI p	l Intelligence – Intelligent Agents roblems.	I	1,2								
Ι	Introduction Characterist – Problem	on–Definition – Future of Artificia stics of Intelligent Agents–Typical Solving Approach to Typical AI p	l Intelligence – Intelligent Agents roblems. Instruction	I al Hours	1,2 15								
I Suggest	Introduction Characteria – Problem ed Learning	on–Definition – Future of Artificia stics of Intelligent Agents–Typical Solving Approach to Typical AI pr gMethods : Tutorial	l Intelligence – Intelligent Agents roblems. Instruction	I al Hours	1,2 15								
I Suggest II	Introduction Characterist – Problem ed Learning Problem s Informed Optimizati	on–Definition – Future of Artificia stics of Intelligent Agents–Typical Solving Approach to Typical AI pr g Methods : Tutorial olving Methods – Search Strateg – Heuristics – Local Search on Problems -Searching with Par	I Intelligence – Intelligent Agents roblems. Instruction ies- Uninformed – Algorithms and tial Observations –	I al Hours	1,2 15 3,4								
I Suggest II	Introduction Characteria – Problem ed Learning Problem s Informed Optimizati Constraint Backtracki	on–Definition – Future of Artificia stics of Intelligent Agents–Typical Solving Approach to Typical AI pr Methods : Tutorial olving Methods – Search Strateg – Heuristics – Local Search on Problems -Searching with Par Satisfaction Problems – Constra ng Search – Game Playing – Op	I Intelligence – Intelligent Agents roblems. Instruction ies- Uninformed – Algorithms and tial Observations – aint Propagation – otimal Decisions in	I al Hours I	1,2 15 3,4								
I Suggest II	Introduction Characteria – Problem ed Learning Problem s Informed Optimizati Constraint Backtracki Games – A	on–Definition – Future of Artificia stics of Intelligent Agents–Typical Solving Approach to Typical AI pr gMethods : Tutorial olving Methods – Search Strateg – Heuristics – Local Search on Problems -Searching with Par Satisfaction Problems – Constra ng Search – Game Playing – Op Jpha – Beta Pruning – Stochastic C	I Intelligence – Intelligent Agents roblems. Instruction ies- Uninformed – Algorithms and tial Observations – aint Propagation – otimal Decisions in Games	I al Hours I	1,2 15 3,4								
I Suggest II	Introduction Characteria – Problem ed Learning Problem s Informed Optimizati Constraint Backtracki Games – A	on–Definition – Future of Artificia stics of Intelligent Agents–Typical Solving Approach to Typical AI pr <u>Methods : Tutorial</u> olving Methods – Search Strateg – Heuristics – Local Search on Problems -Searching with Par Satisfaction Problems – Constra ng Search – Game Playing – Op Ipha – Beta Pruning – Stochastic C	I Intelligence – Intelligent Agents roblems. Instruction ies- Uninformed – Algorithms and tial Observations – aint Propagation – otimal Decisions in Games Instruction	I al Hours I al Hours	1,2 15 3,4 15								
I Suggest II Suggest	Introduction Characteria – Problem ed Learning Problem s Informed Optimizati Constraint Backtracki Games – A ed Learning	on–Definition – Future of Artificia stics of Intelligent Agents–Typical Solving Approach to Typical AI pr gMethods : Tutorial olving Methods – Search Strateg – Heuristics – Local Search on Problems -Searching with Par Satisfaction Problems – Constra ng Search – Game Playing – Op Ipha – Beta Pruning – Stochastic C gMethods: Group Discussion	I Intelligence – Intelligent Agents roblems. Instruction ies- Uninformed – Algorithms and tial Observations – aint Propagation – otimal Decisions in Games Instruction	I al Hours I al Hours	1,2 15 3,4 15								
I Suggest II Suggest III	Introduction Characterist – Problem ed Learning Problem s Informed Optimizati Constraint Backtracki Games – A ed Learning Knowledge Programm Chaining Ontologica Mental Eve	on–Definition – Future of Artificia stics of Intelligent Agents–Typical Solving Approach to Typical AI pr Methods : Tutorial olving Methods – Search Strateg – Heuristics – Local Search on Problems -Searching with Par Satisfaction Problems – Constra ng Search – Game Playing – Op alpha – Beta Pruning – Stochastic C Methods: Group Discussion e Representation First Order Predi- ing – Unification – Forward – Resolution – Knowledge al Engineering-Categories and C ents and Mental Objects – Reasoni	I Intelligence – Intelligent Agents roblems. Instruction ies- Uninformed – Algorithms and tial Observations – aint Propagation – otimal Decisions in Games Instruction cate Logic – Prolog Chaining-Backward Representation – objects – Events – ing Systems for	I al Hours I al Hours	1,2 15 3,4 15 4,5								

	Instructional Hou											l Hours	S I	15
Sugges	ted Le	arning	g Method	ls : Gr	oup D	iscussi	ion							
	Soft	ware A	Agents A	rchitec	ture fo	r Intel	ligent	Ager	nts —	Agen	t	Ι		
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	amo	ng Ag	ents – Tr	ust and	l Repu	tation i	n Mu	lti-age	ent s	system	s.			
										Instr	uctiona	l Hours	S I	15
Sugges	ted Le	arning	g Method	ls :Vi	deo Pi	resenta	ation							
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	 Machine Translation – Speech Recognition – Robot – Hardward – Perception – Planning 										dware			,
~										Instr	uctiona	l Hours	S I	15
Sugges	ted Le	arning	g Method	ls : Vio	deo Pr	esenta	tion				Tata	1 11	. 75	II
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Keierei	nce Bo	OKS	Edit	ion,Ac	ldison	-Wesle	y Edu	cation	nal F	Publish	ers Inc.	, 2015.		
			2. M.	Dhivya	a, S. Ka		zhi Su	guna,	Sar	a Paiva	a, "Artif	icial Int	elligenc	e
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PO	POI	PO2	P03	PO4	P05	PO6	P07	PC	18	PSOI	PS02	PS03	P804	P805
C01	Н	Н	H	M	H	М	Н	H	[H	Н	H	M	Н
CO2	Н	Н	Н	М	Н	М	Н	Н	[Н	Н	Н	М	Н
CO3	Н	Н	Н	М	Н	М	Н	Н	[Н	Н	Н	М	Н
CO4	Н	Н	Н	М	Н	М	Н	Н	[Н	Н	Н	М	Н
CO5	Н	Н	Н	М	Н	М	Н	Н	[Н	Н	Н	М	Н
H-High	; M-M	edium	; M-Mow	1					I					
		Cou	rse desig	ned by	7					Veri	fied by	Chairm	an	
		Dr.	Juliet Ro	ozario]	Dr. N. K	avitha		

Cou	ırse Code	Title							
23P	GDTC204	Paper IV :	Dee	p Learning for	Data Scienc	e			
Semest	er: II	Credits: 4 (CIA	: 25 Marks	ESE:75 M	arks			
Course	Objective	Equip students with deep problems through practical	lear 1 app	rning skills to s	olve complex odel interpret	x data science ation.			
Course	Category	Skill Development							
Develop	oment Needs	Global							
Course	Description	This course explores the the in data science. Students le for tasks such as image generative modeling.	neory earn reco	y and practical a to build and inte- gnition, natural	pplications of erpret deep no language pr	f deep learning eural networks rocessing, and			
Course	Outcomes		Teaching Methods	Assessme	nt Methods				
CO 1	Understand learning ar	d the basic concepts of Deep nd tools		Lecture	Group	Discussion			
CO 2	Learn the deep learn	foundation of various types ing algorithms including CNN	of	Lecture	Quiz				
CO 3	Recollect RNN, L Recognitio	the concepts and working of STM and Named Entity	f	Video Lesson	s Semir	nar			
CO 4	Demonstra algorithms other techr	te various deep learning including VAEs, GANs and iques		Tutorial / Video Lesson	s Semir	nar			
CO 5	Illustrate mechanisn understand learning.	several types of attention ns in deep learning and l emerging trends of deep	n d p	Video Lesson	s Assig	nment			
Offered	l by Data Sci	ience							
Course	Content		In	structional Hou	irs / Week :5	5			
Unit		Description			Text Book	Chapters			
I	Introduction t Foundations Perceptrons. A Deep Learnin Deep Neural N Overfitting an - Deep Learnin	o Artificial Intelligence and I of Deep Learning - Neu Activation Functions and Net ng Libraries (TensorFlow, P Networks - Gradient Descent ar Id Regularization - Model Eva ng Frameworks and Tools.	Macl ral worl yTor nd Ba iluat	hine Learning - Networks and Architectures: rch) - Training ackpropagation. ion and Metrics	1	1, 2, 3			
Suggest	ad Looming N	Inthadas Tutarial		Instructio	onal Hours	15			
Suggest	Introduction	to Convolutional Neural N	letwo	orks (CNNs) -	1				
II	Convolutiona Spatial Redu	al Layers and Feature Maps - ction - CNN Architectures (Lel	Poo Net,	ling Layers and AlexNet, VGG,	1	4, 5			

	ResN Dete	Net) - Tr ction and	ansfer l Loca	Learning with lization with C	Pretrained Cl CNNs - Image	NNs - Object Classification		
	and Adve	Recogni ersarial H	tion Examp	- Semantic S les - Ethical (Segmentation Considerations	- Generating in Computer		
	V ISIC)II				Instructio	nal Hours	15
Sugges	ted Lea	rning M	[ethod	s: Group Disc	ussion	monucio		
III	RNN Shor (GRU Prepr Class Trans	6, 7, 8						
						Instructio	nal Hours	15
Sugges	ted Lea	rning M	lethod	s : Group Dis	cussion		-1	
IV	Intro Learn Adve Gene Tech Anal Learn	duction ning - ersarial N eration - niques ysis (PC ning App	to Ger Variati Jetwor Anoma (K-Me A). Se blicatio	nerative Model onal Autoenc ks (GANs) - C aly Detection w eans, DBSCA lf-Organizing I ons - Generative	s - Autoencod oders (VAEs) Conditional GA vith Autoencod N) - Princip Maps (SOMs) e Models for C	ers for Feature - Generative ANs and Image ers - Clustering al Component - Unsupervised reativity.	e g 1 t	10, 11, 12
						Instructio	nal Hours	15
Sugges	ted Lea	rning M	[ethod	s :Video Pres	entation			
V	Attent Learn Gradie Expla Mitiga Health Trend	tion Mee ing Basi ents and inable A ation - Fe ncare - D s and Fu	chanist cs - Acto AI in derate Deep L ture of	ms in Deep Deep Reinford r-Critic. Trans Deep Learning d Learning and earning for Tin Deep Learning	Learning - R cement Learni sfer Learning ng. Ethical A Privacy - Deej me Series Data g.	einforcement ing - Policy Strategies - AI and Bias p Learning in a - Emerging	1	15, 16, 17
						Instructio	nal Hours	15
						Te	otal Hours	75 Hrs
Text B	ook	1.	Ian (Lear	Goodfellow, Yo ning",2016.	oshua Bengio,	and Aaron Cou	ırville, "De	ep
Refere	nce Boo	oks 1. 2.	Ada App Anto Coo	m Gibson and . roach", O'Reill onio Gulli, Am kbook", Packt	Josh Patterson, ly Media, 2017 ita Kapoor, "Te Publishing, 20	"Deep Learnir ensorFlow 1.x 17.	ng: A Practi Deep Learr	tioner's
Web. U	JRLs	ht	tps://w	www.geeksforg	eeks.org/deep-	learning-tutoria	al/	
				Tools for A	ssessment (25	Marks)		
CIA	A I	CIA	II	CIA III	Assignment	Seminar	Quiz	Total
	5		5	6	3	3	3	25

Mapping													
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO2	Η	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO3	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO4	Η	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO5	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
H-High;	M-Me	edium;	L-Low										
		Cour	se desig	ned by	7				Ver	ified by	Chairn	nan	
		Dr. I	3. Narasi	imhan					Dr. N. k	Kavitha			

Cou	irse Code	de						
23P0	GDTC205	Paper V: Dat	a Visua	lization Tech	niqu	es using T	ableau	
Semeste	er: II	Credits: 4	CIA	25 Marks	J	ESE:75 M	arks	
Course	Objective	To equip students with visualize complex da patterns, and trends to	h the kno ta sets, diverse	owledge and enabling the audiences for	skills em to infor	necessary commun med decisi	to effectively icate insights, on-making	
Course	Category	Skill Development						
Develop	ment Needs	Global						
Course	Description	This course provides techniques, emphasizin and best practices. St compelling insights eff	olorati ata de w to t	on of data sign, visua transform	visualization lization tools, raw data into			
Course	Outcomes			Teaching Methods	5	Assessmen	nt Methods	
CO 1	Understand of Tableau	the foundational overvie and the platform	ew	Lecture	;	Group	Discussion	
CO 2	Learn about the contract of th	out various data source into Tableau environment	es, its t	Lecture	;	Quiz		
CO 3	Demonstra mechanism	te several data visualization using Tableau	on	Video Less	sons	Semin	ar	
CO 4	Illustrate va using aggre	arious mathematical calcul egate functions	lations	Tutorial Video Less	/ sons	Semin	ar	
CO 5	Analyze va building in	arious tools such as maps teractive dashboards	and	Video Less	sons	Assignment		
Offered	l by Data Sci	ience						
Course	Content		In	structional H	Iours	/Week:5		
Unit		Description				Text Book	Chapters	
I	Introduction a modern analy Installing Tab dataset - The dimensions - V your workboo	nd getting started with Tab tics platform - The Tabl pleau desktop - Data pre Tableau workspace - Wor Vorking with marks - Savin ks.	oleau: Theau app paration king wit ng, open	e advantages lication suite - The samp h measures an ing, and sharin	of c - ole nd ng	1	1	
				Instruc	ctiona	al Hours	15	
Suggest	ed Learning N	Iethods: Tutorial						
IIAdding data sources in Tableau: Setting up a data connector - Selecting data tables - Joins - Unions - Data extracts and live connections - Editing the model's metadata - Datatypes - Adding hierarchies, calculated fields, and table calculations - Checklist for increasing performance1						2		
	Instructional Hours 15						15	
Suggest	ed Learning N	Iethods: Group Discussion	on					
III	Creating data - Bar charts, Highlight tab	visualizations: Chart type legends, filters, and hier les - Heatmaps - Bullet cl	es - Reac rarchies narts - C	ly, set, show i - Line charts umulative sur	me s - ms	1	3	

	with	wate	rfall cha	rts - I	leau								
I	VISUU	mzan	511.						Instru	ictiona	l Hours		15
Suggest	ed Lea	arning	g Metho	ds : G	roup D	Discuss	sion						
IV	Aggi - Ca opera level table	regate lculate ators - of det calcu	function ed fields Date fie tail calcu lations -	s and - Ag lds - L lations Level	calcula gregati ogical : Quic of deta	ated fie ions ir functio k table ail exp	elds : A n calcu ons. Ta calcul ression	Aggreg lated ble cal ations	ate func fields - culation - Custor	tions Text s and nized	1		4, 5
Instructio											l Hours		15
Suggested Learning Methods :Video Presentation													
V	Maps: - Map analyt Const - Clu dashb buttor	: Sym' s with ics, tr ant, av ister oard - is and	bol maps pie char rends, fo verage, a analysis The das dashboa	- Fille ts - M recasts nd refe . Inter hboard rd acti	ed map apbox s, clust erence ractive l pane - ons.	os - De maps - ers an lines - dash - Dash	nsity m - Spatia d other Trend boards board t	naps - 1 al data. r statis lines : Cre itles - 1	Map lay Advance tical too - Foreca ating n Navigati	ers ced ols: usts ew ion	1	6,	7, 8
									Instru	ictiona	l Hours		15
										Tota	l Hours	75	Hrs
Text Bo	ok		1. Ale	xandei	·Loth,	"Visu	al Ana	lytics v	with Tab	leau", '	Wiley, 20)19.	
Referen	ce Boo	oks	 Scot Inc., Elija Java 	t Murra 2013. Ih Meel Script,	ay, "Int ks , D3. <u>Publish</u>	eractiv js in A <u>her: Ma</u>	e data v ction, S unning I	isualiza becond Publica	ation for Edition: tions, 20	the web Data vis 17.	", O"Reil sualizatior	ly Medi	a,
Web. U	RLs		https://	www.g	geeksto	orgeek	s.org/p	ython-	data-vis	ualizati	on-tutori	al/	
				To	ols for	· Asses	ssment	t (25 N	larks)				
CIA	Ι	C	CIA II	C	IA III	A	ssignm	ent	Semina	ır	Quiz	Т	otal
	5		5		6		3		3		3		25
						Ma	apping						
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
<u>CO1</u>	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO2	H	Н	Н	Μ	Н	Μ	H	H	Н	Н	Н	Μ	H
CO3	H	H	H	M	H	M	H	H	H	H	H	M	H
	H	H	H	M	H	M	H	H	H	H	H	M	H
H_High		H		IVI	Н	M	Н	Н	Н	Н	Н	M	Н
II-High;	101-1016		, L-LOW										
		Cour	se desig	ned by	7				Ver	ified by	y Chairn	nan	
		Dr	. K. Sun	athi						Dr. N.	Kavitha		

Cou	ırse Code	Title							
23	PGDTC206	Pa	per	VI: Linear Algebra	a				
Seme	ester: II	Credits: 4	CIA	:25 Marks	ESE: 75	Marks			
Cours	se Objective	To learn the fundamental con theory.	cep	ts and basic ideas in	volved in r	natrix			
Cours	se Category	Employability							
Develo	pment Needs	Global							
Course	e Description	Linear algebra is the study of linear transformations	Sys	stem of linear equati	ons, vector	r spaces, and			
Course	Outcomes			Teaching Methods	Assessme	ent Methods			
CO 1	Demonstrate systems.	the applications of Line	ear	Lecture / Video Lectures	Ass	ignment			
CO 2	Review the m Invertible Ma	natrix algebra and use the atrix Theorem.		Lectures / Video Lessons	Se	eminar			
CO 3	Analyze the determinant	e geometric interpretation	of	Lectures / Video Lessons		Quiz			
CO 4	Discuss the transformation	kernel and range of a Linear		Tutorial / Lecture	Se	eminar			
CO 5	Application of to Dynamica	of Eigen values and Eigen vector l System	ors	Lecture / Video Lectures	Ass	ignment			
Offered	by Mathem	atics							
Course	Content		Ir	nstructional Hours	/ Week : 5				
				isti uctionai mours					
Unit		Description			Text Book	Chapters			
Unit	Linear Equat - Row reducti equations Ax = linear system transformation	Description ions in Linear Algebra: Syste ion and Echelon form - Vect = b - Solution set of linear systems - Linear Independence. In as -The matrix of Linear transformer	ems or I stem ntro	of linear equations Equations - Matrix as - Applications of duction to Linear ation	Text Book	Chapters 1			
Unit	Linear Equat - Row reducti equations Ax = linear system transformation	Description ions in Linear Algebra: Syste ion and Echelon form - Vect = b - Solution set of linear systentiations s - Linear Independence. In the matrix of Linear transformation	ems or I stem ntro	of linear equations Equations - Matrix as - Applications of duction to Linear ation Instruction	Text Book 1 al Hours	Chapters 1 17			
Unit I Suggest	Linear Equat - Row reducti equations Ax = linear system transformation	Description ions in Linear Algebra: Syste ion and Echelon form - Vect = b - Solution set of linear systentiations s - Linear Independence. In its -The matrix of Linear transfor Iethods: Assignment	ems or H stem ntro	of linear equations Equations - Matrix as - Applications of duction to Linear ation Instruction	Text Book 1 al Hours	Chapters 1 1 17			
Unit I Suggest II	Linear Equat - Row reducti equations Ax = linear system transformation ed Learning M Matrix Algeb Characterization Matrix factoriz	Description ions in Linear Algebra: Syste ion and Echelon form - Vect = b - Solution set of linear systents s - Linear Independence. In the matrix of Linear transformation Iethods: Assignment ra: Matrix operations -The involutions of Invertible Matrices - zations -Subspaces of R ⁿ - Dim	ems or I stem ntro prma verse Part ens	of linear equations Equations - Matrix as - Applications of duction to Linear ation Instruction e of a matrix - titioned Matrices - ion and Rank.	Text Book 1 al Hours	Chapters 1 17 2			
Unit I Suggest II	Linear Equat - Row reducti equations Ax = linear system transformation ed Learning N Matrix Algeb Characterizatio Matrix factoriz	Description ions in Linear Algebra: Syste ion and Echelon form - Vect = b - Solution set of linear syste s - Linear Independence. In as -The matrix of Linear transfor Iethods: Assignment ra: Matrix operations -The involutions of Invertible Matrices - zations -Subspaces of R ⁿ - Dim	ems or I ttem ntro prma erse Part eens	of linear equations Equations - Matrix as - Applications of duction to Linear ation Instruction e of a matrix - titioned Matrices - ion and Rank. Instruction	Text Book	Chapters 1 17 2 18			
Unit I Suggest II Suggest	Linear Equat - Row reducti equations Ax = linear system transformation ed Learning N Matrix Algeb Characterization Matrix factorization Matrix fa	Description ions in Linear Algebra: Syste ion and Echelon form - Vect = b - Solution set of linear systems s - Linear Independence. In its -The matrix of Linear transfor Iethods: Assignment ra: Matrix operations -The involutions of Invertible Matrices - The invertible Matrices - The	ems or I ttem ntro prma verse Part	of linear equations Equations - Matrix as - Applications of duction to Linear ation Instruction e of a matrix - titioned Matrices - ion and Rank. Instruction	Text Book	Chapters 1 1 2 18			
Unit I Suggest II Suggest III	Linear Equat - Row reducti equations Ax = linear system transformation ed Learning M Matrix Algeb Characterizatio Matrix factoriz ed Learning M Determinants Crammer's rul	Description ions in Linear Algebra: Syste ion and Echelon form - Vect = b - Solution set of linear systection s - Linear Independence. In the matrix of Linear transfor Iethods: Assignment ra: Matrix operations - The involutions of Invertible Matrices - The rations -Subspaces of R ⁿ - Dimensional Iethods: Problem Solving I: Introduction - Properties of e Volume and Linear Transfor	ems or I ttem ntro prma Part ens: the	of linear equations Equations - Matrix as - Applications of duction to Linear ation Instruction e of a matrix - titioned Matrices - ion and Rank. Instruction Determinant - ations	Text Book	Chapters 1 1 2 18 3			
Unit I Suggest II Suggest III	Linear Equat - Row reducti equations Ax = linear system transformation ed Learning M Matrix Algeb Characterizatio Matrix factoriz ed Learning M Determinants Crammer's rul	Description ions in Linear Algebra: Syste ion and Echelon form - Vect = b - Solution set of linear syste s - Linear Independence. In as -The matrix of Linear transfor Iethods: Assignment ra: Matrix operations -The involutions of Invertible Matrices - zations -Subspaces of R ⁿ - Dimensional Iethods: Problem Solving : Introduction - Properties of e, Volume, and Linear Transfor	ems or I ttem ntro prma verse Part eens the prma	of linear equations Equations - Matrix as - Applications of duction to Linear ation Instruction e of a matrix - titioned Matrices - ion and Rank. Instruction Determinant - ations. Instruction	Text Book	Chapters 1 17 2 18 3 10			
Unit I Suggest II Suggest III	Linear Equat - Row reducti equations Ax = linear system transformation ed Learning N Matrix Algeb Characterization Matrix factorization Matrix Matrix Matrix factorization Matrix factorization Matrix	Description ions in Linear Algebra: Syste ion and Echelon form - Vect = b - Solution set of linear systects s - Linear Independence. In s -The matrix of Linear transfor Iethods: Assignment ra: Matrix operations -The investigations of Invertible Matrices - zations -Subspaces of R ⁿ - Dime Iethods: Problem Solving : Introduction - Properties of e, Volume, and Linear Transfor Iethods : Group Discussion	ems or I ttem ntro prma Part ens the prma	of linear equations Equations - Matrix as - Applications of duction to Linear ation Instruction e of a matrix - titioned Matrices - ion and Rank. Instruction Determinant - ations. Instruction	Text Book	Chapters 1 1 17 2 18 3 10			
Unit I Suggest II Suggest III Suggest IV	Linear Equat - Row reducti equations Ax = linear system transformation ed Learning M Matrix Algeb Characterization Matrix factoriz ed Learning M Determinants Crammer's rul ed Learning M Vector Spaces spaces and line Bases- Coordin	Description ions in Linear Algebra: Syste ion and Echelon form - Vect = b - Solution set of linear syste s - Linear Independence. In as -The matrix of Linear transfor Iethods: Assignment ra: Matrix operations -The involutions of Invertible Matrices - zations -Subspaces of R ⁿ - Dim Iethods: Problem Solving : Introduction - Properties of e, Volume, and Linear Transfor S: Vector spaces and subspaces ear transformations - Linearly in nate systems -The dimension of	ems or I ttem ntro prma verse Part eens: the prma	of linear equations Equations - Matrix as - Applications of duction to Linear ation Instruction e of a matrix - titioned Matrices - ion and Rank. Instruction Determinant - ations. Instruction ull spaces, Column ependent sets - vector space-Rank.	Text Book	Chapters 1 17 2 18 3 10 4			
Unit I Suggest II Suggest IV	Linear Equat - Row reducti equations Ax = linear system transformation ed Learning N Matrix Algeb Characterization Matrix factoriz ed Learning N Determinants Crammer's rul ed Learning M Vector Spaces spaces and line Bases- Coordin	Description ions in Linear Algebra: Syste ion and Echelon form - Vect = b - Solution set of linear systems s - Linear Independence. In its -The matrix of Linear transfor Iethods: Assignment ra: Matrix operations -The invertible Matrices - zations of Invertible Matrices - zations -Subspaces of R ⁿ - Dime Iethods: Problem Solving I: Introduction - Properties of e, Volume, and Linear Transfor S: Vector spaces and subspaces ear transformations - Linearly in nate systems -The dimension of	ems or I ttem ntro prma verse Part ens the prma 5 -N inde f a v	of linear equations Equations - Matrix as - Applications of duction to Linear ation Instruction e of a matrix - titioned Matrices - ion and Rank. Instruction Determinant - ations. Instruction ull spaces, Column ependent sets - vector space-Rank. Instruction	Text Book	Chapters 1 1 17 2 18 3 10 4 15			

V	Eigen The Ch linear ti	en values and Eigenvectors: Eigenvectors and Eigen values - Characteristic equations – Diagonalization - Eigenvectors and 1 5 ar transformations - Complex Eigen values.											
					<u>P</u>	8			Instr	uction	al Hours	s 1	15
Suggeste	d Lear	ning N	Iethod	ls : Gr	oup D	iscussi	ion						
										Tot	al Hours	s 75	Hrs
Text Boo	bk		David Applic Unit – Unit – Unit – Unit – Unit –	C. Lay cations I: Cha II: Ch III: Ch III: Cl IV: Cl VI: Cl	y, Stev s" Pea pter 1 apter 2 hapter 3 hapter 4	en R. 1 rson Pt : Sections: Sect : Sect : Sect : Sect : Sect	Lay, Jud ublications 1.1- ions 2.1 tions 3. tions 4. jons 5.1	di. J. N ons, Fi 1.9 - 2.5, 1- 3.3 1-4.6 I-5 5	AcDona fth Ed., 2.7-2.9	ld, " Li 2016	near Alg	jebra ar	nd its
Reference	e Book	5	Gilbe Publi	ert Structure	rang, s, Four	"Line th Edit	ar Alg	gebra 22.	and i	its A _l	oplicatio	ns", Co	engage
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				То	ols for	Asses	sment ((25 Ma	arks)				
CIA	T	CI	АП		та пп				a .		Unit	Та	
	-	U	A 11		1A 111	A	signine	ent	Semina	ar	Test	10	tal
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5	-		5		6 6	Ma	$\frac{3}{pping}$	ent	Semina 3	ar	Test 3	2	5
5 CO\PO	P01	PO2	5 PO3	PO4	6 PO5	Ma PO6	3 pping PO7	PO8	Semina 3 PSO1	PSO2	Test 3 PSO3	2 PSO4	5 PSO5
5 CO\PO CO1	РО1 Н	РО2 Н	РОЗ М	РО4 М	6 РО5 М	Ma PO6 L	3 pping PO7 M	PO8 H	Semina 3 PSO1 H	PSO2 M	Test 3 PSO3 M	РSO4 Н	5 PSO5 H
5 CO\PO CO1 CO2	РО1 Н Н	РО2 Н Н	5 PO3 M M	РО4 М М	6 PO5 M M	Ma PO6 L L	3 pping PO7 M M	PO8 H H	Semina 3 PSO1 H H	PSO2 M M	Test 3 PSO3 M M	РSO4 Н Н	5 PSO5 H M
5 CO\PO CO1 CO2 CO3	РО1 Н Н	РО2 Н Н	5 PO3 M M M	PO4 M M M	6 PO5 M M M	Ma PO6 L L L	3 pping PO7 M M M	PO8 H H H	Semina 3 PSO1 H H M	PSO2 M M M	Test 3 PSO3 M M M H	РSO4 Н Н	5 PSO5 H M H
5 CO\PO CO1 CO2 CO3 CO4	РО1 Н Н Н	РО2 Н Н Н	5 PO3 M M M M	PO4 M M M M	6 PO5 M M M M	Ma PO6 L L L L	3 pping PO7 M M M M	PO8 H H H H	Semina 3 PSO1 H H M H	PSO2 M M M H	Test 3 PSO3 M M M H H	PSO4 H H H M	5 PSO5 H M H H
5 CO\PO CO1 CO2 CO3 CO4 CO5	РО1 Н Н Н Н	РО2 Н Н Н Н	5 PO3 M M M M M	PO4 M M M M M	6 PO5 M M M M M	AS Ma PO6 L L L L L L	3 pping PO7 M M M M M	PO8 H H H H H	Semina 3 PSO1 H H H H	PSO2 M M M H H	Test 3 PSO3 M M M H H H	PSO4 H H M M	5 PSO5 H M H H H
5 CO \ PO CO1 CO2 CO3 CO4 CO5 H-High;	PO1 H H H H M-Med	РО2 Н Н Н Н	5 PO3 M M M M M M -Low	PO4 M M M M M	6 PO5 M M M M M	AX Ma PO6 L L L L L	3 pping PO7 M M M M M	PO8 H H H H	Semina 3 PSO1 H H H H H H	PSO2 M M M H H	Test 3 PSO3 M M H H H H	PSO4 H H M M	psos H M H H H
5 CO\PO CO1 CO2 CO3 CO4 CO5 H-High;	PO1 H H H H M-Med	PO2 H H H H ium; L	5 PO3 M M M M M M -Low	PO4 M M M M M	6 PO5 M M M M M	AS Ma PO6 L L L L L	3 pping PO7 M M M M	PO8 H H H H	Semina 3 PSO1 H H H H Veri	PSO2 M M M H H	Test 3 PSO3 M M H H H H	PSO4 H H M M	tal 5 PSO5 H M H H H

Cours	se Code	Title							
23P0	GDTQ203	Pra	actical III:	Deep Learni	ng with	Python			
Sen	nester: II	Credits: 4	CIA :	40 Marks		ESE: 60	Marks		
Course (Objective	Equip students with science problems th	deep learni rough practi	ng practical s cal application	kills to so ons and n	olve compl nodel inter	lex data pretation		
Course (Category	Skill Development							
Develop	ment Needs	Global							
Course I	Description	To learn practical a build and interpre recognition, natural	pplications et deep ne language pi	of deep learn ural network ocessing, and	ing in da s for t l generat	ta science asks such ive modelin	and able to as image ng.		
Course (Outcomes			Teaching N	Aethods	Assessme	nt Methods		
CO 1	Implement variational	feed forward neural ne encoders	tworks and	Demons	tration	Assi	gnment		
CO 2	Implement and model	Generative Adversaria deployment	l Networks	Demons	tration	Se	minar		
CO 3	Implement Recurrent I	Long Short Term Men Neural Network	nory and	Demons	tration	(Quiz		
CO 4	Implement and Hyperp	Convolutional Neural E parameter Tuning	Network,	Demons	tration	Se	minar		
CO 5	Implement use Autoen	Reinforcement Learnin coders	ng and also	Demons	tration	(Quiz		
Offered	by Data S	cience							
Course (Content			Instructiona	l Hours	/ Week : 5			
Unit			Descri	ption					
1.	Write a pro	ogram in Python for de	emonstrating	g feed forward	l neural i	networks.			
2.	Demonstra	ate Hyperparameter Tu	ining in deep	o learning neu	Iral netwo	ork.			
3.	Create a C recognitio	onvolutional Neural N n.	letworks and	l apply in any	image d	ataset for p	battern		
4.	Write a pr	ogram for establishing	a model dep	oloyment and	serving	with a data	set.		
5.	Write a ba	sic autoencoder progra	am with any	dataset.					
6.	Write a pr	ogram for demonstration	ng Variation	al Autoencod	lers.				
7.	Implemen	t Gated Recurrent Unit	t (GRU) in a	ny time series	s dataset.				
8.	Create a L classificat	ong Short-Term Memo ion problem.	ory (LSTM)	Networks and	d elucida	te its work	ing in a		
9.	Create a R	ecurrent Neural Netwo	ork and use a	a dataset to pe	erform cl	assificatior	n task.		
10.	Create a G problem.	enerative Adversarial	Networks (C	GANs) for a s	imple bii	nary classif	ication		
11.	Write a Ga	ated Recurrent Unit (G	RU) neural	network for A	nomaly	Detection.			
12.	Demonstra	ate Reinforcement Lea	rning (RL) v	with a simple	dataset.				
Instruct	ional Hours						75		
Suggeste	d Learning	Methods : Video lect	tures		Tate	J Hours	75 Uma		
					1012	u 110015	13 111 5		

Text Boo	k		1. Ian Goodfellow, Yoshua Bengio, and Aaron Courville, "Deep Learning",2016.											
Referenc	e Book	S	 Adam Gibson and Josh Patterson, "Deep Learning: A Practitioner's Approach", O'Reilly Media, 2017. Antonio Gulli, Amita Kapoor, "TensorFlow 1.x Deep Learning Cookbook", Packt Publishing, 2017. https://www.geeksforgeeks.org/deep-learning-tutorial/ 											
Web. UR	Ls https://www.geeksforgeeks.org/deep-learning-tutorial/													
				То	ols for	Assess	ment (40 Ma	rks)					
Laborat Performa – Applicat Logio	ory ance tion	Lat Perf – P Cr	oorato formar frograi eativit	ry nce m y	La Perfe Pi De	borato orman rogran buggin	ory ice – n ng	Tes	t - 1	Test ·	- 2	Observ Note F	ation Book	
			Creativity Debugging											
5		5 5 10 10 5												
5			5			5 Maj	pping	10)	10		5		
5 CO \ PO	PO1	PO2	5 PO3	PO4	PO5	5 Maj PO6	oping PO7	PO8	PSO1	PSO2	PS O3	PSO4	PSO 5	
5 CO\PO CO1	РО1 Н	РО2 Н	5 РОЗ Н	РО4 М	РО5 Н	5 Maj PO6 M	pping PO7 H	РО8 Н	р РSO1 Н	10 РSO2 Н	Р О3 Н	РSO4 М	РSO 5 Н	
5 CO\PO CO1 CO2	РО1 Н Н	РО2 Н Н	5 РОЗ Н Н	PO4 M M	РО5 Н Н	5 Maj PO6 M M	pping PO7 H H	РО8 Н Н	РSO1 Н Н	10 РSO2 Н Н	РЅ ОЗ Н Н	PSO4 M M	РSO 5 Н Н	
5 CO\PO CO1 CO2 CO3	РО1 Н Н	РО2 Н Н	5 РОЗ Н Н Н	PO4 M M M	PO5 H H H	5 Maj PO6 M M M	PO7 H H H	PO8 H H H	РSO1 Н Н	10 РSO2 Н Н	РЅ ОЗ Н Н	PSO4 M M M	РSO 5 Н Н Н	
5 CO\PO CO1 CO2 CO3 CO4	PO1 H H H H	РО2 Н Н Н Н	РОЗ Н Н Н Н	PO4 M M M M	PO5 H H H H H	5 Maj PO6 M M M M	PO7 H H H H	РО8 Н Н Н Н	РSO1 Н Н Н	РSO2 Н Н Н Н	Р О3 Н Н Н Н	PSO4 M M M M	РSO 5 Н Н Н Н	
5 CO\PO CO1 CO2 CO3 CO4 CO5	РО1 Н Н Н Н	РО2 Н Н Н Н	РОЗ Н Н Н Н Н	PO4 M M M M M	PO5 H H H H H H H	5 Maj PO6 M M M M	PO7 H H H H H	РО8 Н Н Н Н Н	РSO1 Н Н Н Н Н	РSO2 Н Н Н Н Н	PS O3 H H H H H	PSO4 M M M M M M	РSO 5 Н Н Н Н Н	
5 CO\PO CO1 CO2 CO3 CO4 CO5 H-High; N	PO1 H H H H M-Med	PO2 H H H H ium; L	5 PO3 H H H H H -Low	PO4 M M M M	PO5 H H H H H H H	5 Maj PO6 M M M M	PO7 H H H H H	PO8 H H H H H H H	РSO1 Н Н Н Н	РSO2 Н Н Н Н Н	PS O3 H H H H H H	PSO4 M M M M M	РSO 5 Н Н Н Н Н	
5 CO\PO CO1 CO2 CO3 CO4 CO5 H-High; N	PO1 H H H H M-Med	PO2 H H H H ium; L	SPO3HHHHHHedesign	PO4 M M M M	PO5 H H H H H H H H Y	5 Maj PO6 M M M M	PO7 H H H H H	PO8 H H H H H	PSO1 H H H H Verif	PSO2 H H H H H	PS O3 H H H H H Chair	PSO4 M M M M M m	PSO 5 H H H H	

Cours	se Code	Title								
23P0	GDTQ204	Practical	IV: Data	Visualization u	sing Tableau					
Sen	nester: II	Credits: 4	CIA	: 40 Marks	ESE: 60	Marks				
Course (Dbjective	To equip students with enabling them to comm audiences for informed	the praction nunicate in decision-	cal skills to visua sights, patterns, a making	lize complex data and trends to di	ata sets, verse				
Course (Category	Skill Development								
Develop	ment Needs	Global								
Course I	Description	This course provides a emphasizing the princ practices. Students wil visual narratives, gaini effectively.	practical piples of c l learn ho ing the ab	exposure of data lata design, visu w to transform i ility to commun	visualization t alization tools aw data into c icate data-drive	echniques, , and best compelling en insights				
Course (Outcomes			Teaching Metho	ds Assessmen	t Methods				
CO 1	Learn to importing d	implement data con ata and use chart types	nnection,	Demonstratio	n Assig	gnment				
CO 2	Implement shaping dat	data cleaning, data transf a	form and	Demonstratio	n Sen	ninar				
CO 3	Work with and format	string functions, number f ing options	functions	Demonstratio	n Q	uiz				
CO 4	Create dash system and	board for attendance mar library management syste	nagement m	Demonstratio	n Sen	ninar				
CO 5	Create dash and contact	board for bus depot inf information system	ormation	Demonstratio	n Q	uiz				
Offered	by Data S	cience			1					
Course (Content		Ir	nstructional Hou	rs / Week : 5					
Unit			Descript	tion						
1.	Demonstra	te data connection capabi	lities using	g Tableau.						
2.	Demonstra	te on importing data from	n several so	ources in Tableau						
3.	Import dat	a from a data source and u	ise at least	3 appropriate ch	art types.					
4.	Demonstra	te how data cleaning can	be perforn	ned in imported of	lata using Table	eau.				
5.	Demonstra	te how data transform car	n be perfor	med in imported	data using Tab	leau.				
6.	Demonstra	te how shaping data can b	be perform	ed in imported d	ata using Table	au.				
7.	Import a d	ataset and demonstrate str	ing function	ons and number f	unctions in Tab	oleau.				
8.	Import a d environme	ataset and make use of for	nt, alignme	ent, shading and l	oorders in Table	eau				
9.	Create a da	ashboard in tableau for stu	ident atten	dance manageme	ent system.					
10.	Create a da	ashboard in tableau for lib	rary mana	gement system.						
11.	1. Create a dashboard in tableau for bus depot management system.									
12.	Create a da	ashboard in tableau for con	ntact infor	mation system.						
Instructi	onal Hours					15				

Suggeste	d Lear	ning N	/lethod	ls :V	video leo	ctures							
										Tota	l Hour	s 75	Hrs
Text Boo	k		1.	Ben	Fry, "V	isualiz	ing D	ata", Oʻ	Reilly I	Media, I	nc., 200	7.	
Referenc	e Book	KS	1. 2.	Scott Med Elija with	t Murray ia,Inc., 2 h Meeks JavaScri	, "Inter 013. , D3.js pt, Pub	active in Ac lisher:	data vis tion, Sec Mannin	ualizatio cond Edi g Publica	n for the tion: Data ations, 20	web", O a visuali 17.	"Reilly zation	
Web. UR	RLs		https:	://ww	w.geeks	forgee	ks.org	g/tableau	ı-data-v	isualizat	ion-tuto	orial/	
Tools for Assessment (40 Marks)													
Laborat Performa – Applicat Logic	ance tion	Lat Perf – P Cr	oorato corman cogran rogran reativit	ry nce m y	La Perfe P De	borato orman rogran buggii	ory ice – n ng	Tes	t - 1	Test	- 2	Observ Note I	vation Book
5			5			5		1	0	10		5	
						Maj	pping						
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	Н	Н	Н	Μ	Н	М	Н	Н	Н	Н	Н	М	Н
CO2	Н	Н	Н	Μ	Н	М	Н	Н	Н	Н	Н	М	Н
CO3	Н	Η	Н	Μ	Н	М	Н	Н	Н	Н	Н	М	Н
CO4	Н	Н	Н	M	Н	М	Н	Н	Н	Н	Н	М	Н
CO5	Н	Н	Н	M	Н	M	Н	Н	Н	Н	Н	M	Н
H-High; N	M-Med	lium; L	-Low										
	Course designed by Verified by Chairman												
		Dr. 1	N. Kav	itha]	Dr. N. K	avitha		

Co	urse Code	Title									
23P	GDTE204	E204 Elective Paper II A: Web Analytics									
Semest	er: II	Credits: 4 Cl	A: 25 Marks	ESE:75 M	arks						
Course	Objective	To provide an overview and th	e importance of web	analytics ar	nd helps to						
Course	Category	Employability	<u>cs.</u>								
Develor	oment Needs	Global									
Course	Description	Web analytics explores the e	effective of Web an	alytic strate	egies and						
Course	Outcomes	mplementation	Teaching Methods	Assessme	nt Methods						
CO 1	Understand we google analytic	b analytics, its analysis and	Lecture	Group	Discussion						
CO 2	Implement per segmentation	formance indicators and	Lecture	Quiz							
CO 3	Analyze key po analytics	erformance indicators in Google	Video Lessons	Semir	ar						
CO 4	Acquire quality integration.	ative analytics, KPIs and its	Tutorial / Video Lessons	Semir	lar						
CO 5	Create visual a and network re	nalytics using graph visualization lationships	Video Lessons	Assig	nment						
Offered	l by 🛛 Data Sci	ence									
Course	Content		Instructional Hour	s / Week :5							
Unit		Description		Text Book	Chapters						
I	Introduction t model of Ana working of W Metrics and analytics	o Web analytics: Web analyti alysis – Context matters – Da Veb analytics: Log file analysi Dimensions – Interacting with	cs Approach – A ta contradiction – s- Page tagging – n data in Google	1	1,2						
G	17 1 1		Instructio	nal Hours	15						
Suggest	ea Learning M	letnoas: 1 utorial	analytics. Coale								
п	Introduction – reports in C Analyzing wel Analysing use	Goals and conversions – conv Google Analytics – Performa b users: Learning about users – r content – click – path analysis	ersion rate – Goal nce Indicators – Traffic Analysis – – Segmentation.	1	3,4						
		1 7	Instructio	nal Hours	15						
Suggest	ed Learning M	lethods: Group Discussion									
ш	 Google Analytics - Different analytical tools – Key features and capabilities of Google analytics – How Google analytics works – Implementing Google analytics- Getting up and Running with Google analytics – Navigating Google analytics – Using Google analytics reports – Google metrics – Using visitor data to drive website improvement – Focusing on key performance indicators – Interpreting Google analytics metrics – Using Coogle analytics – Indicators – Interpreting Google analytics – Source analytics – Using Visitor data to drive website improvement – Focusing on key performance indicators – Interpreting Google analytics – Source analytics – Source analytics – Indicators –										
	integrating Go	ogle analytics with third party ap	opilications.								

										Instr	uctio	nal	Hours	5	15
Suggest	ed Lea	rning M	[ethod	s :Gro	oup Di	scussi	on					-			
IV	Heuristic evaluations – Site visits – Surveys (Questionnaires) – Testing and Experimentation: A/B Testing and Multivariate testing – Competitive Intelligence – Analysis search Analytics: V Performing Internal Site Search Analytics, Search Engine 2 Optimization(SEO) and pay per Click(PPC) - Website Optimization against KPIs – Content Optimization – Text Analytics: Natural Language Processing(NLP) – Supervised Machine Learning(ML) Algorithms											3,4			
	Instructional Hours												5	15	
Suggest	ed Lea	rning M	[ethod	s :Vid	leo Pr	esenta	tion					-			
V	Visua Group with c Filter Forma Social	I Analyt ing – Ac cubes and Shelf – T atting – Pa Network	tics : Idition I MDX The Fo aramet a – Gra	Drill al way (– Fili rmattin ers – S ph Vis	down s to G tering t ng Pano Social N ualizat	and roup – for Toj e – Tre Networ ion – N	hiera Crea p and end L k An Netwo	rchies ating so 1 Top 1 Lines – alysis: ork Rela	– ets N – Fo Ty atic	Sorting – Anal – Using precasting pes of ponships	ysis the g –		2		5,6
										Instr	uctio	nal	Hours	3	15
											То	tal	Hours	5 75	Hrs.
Text Book1. Beasley M, "Practical Web Analytics for user experience: How analyticscan help you understand users", CRC Press, 2016. 2. Clifton B, "Advanced Web Metrics with Google Analytics", John Wiley &Sons, VND Publications, 2017.										hn					
Referen	ce Boo	lks	2.	Guio busi Pedi Wilo	de tour ness", ro Sost ey, 200	ndersta CRC I re, Jen 07.	ndin Press	g How , 2004. C LeCla	yc aire	our web	site af Analy	fect	ts your s For D	Dummie	s",
Web. Ul	RLs		https	://built	in.con	n/web-	analy	ytics							
				Te	ools fo	r Asse	ssme	ent (25	Μ	arks)					
CIA	Ι	CIA	II	C	IA III	As	ssign	ment		Semina	ar	Ç	Quiz	Т	otal
5			5		6			3		3			3		25
			PO			M	appi	ng							
CO \ PO	PO1	PO2	PO 3	PO4	PO5	PO6	PO	97 PC)8	PSO1	PSO	2	PSO3	PSO4	PSO5
CO1	Н	Н	Н	М	Н	М	Н	Н	[Н	Н		Н	М	Н
CO2	Н	Н	Н	М	Н	М	Н	H	[Н	Н		Н	М	Н
CO3	Н	Н	Н	М	Н	М	Н	Н	[Н	Н		Н	М	Н
CO4	Н	Н	Н	М	Н	М	Н	Н	[Н	Н		Н	М	Н
CO5	Н	Н	Н	М	Н	М	Н	Н	[Н	Н		Н	М	Н
H-High;	M-Me	dium; L-	Low												
	Course designed by Verified by Chairman														
		Dr. Jul	liet Ro	zario							Dr. N	J. K	avitha		

Cour	se Code			Title						
23PG	DTE205	Elective Paper II B: Social Media Analytics								
Semeste	er: II	Credits: 4	CIA	: 25 Marks	ESE:75 M	arks				
Course	Objective	Familiarize the learners with	differe	ent tools of social m	edia analyt	ics.				
Course	Category	Entrepreneurship								
Develop	ment	Global								
Needs				1 . 1	• 1					
Descript	tion	Social Media Analytics for levels and influence of social	evels and influence of social media content and pro							
Descript		le vers and influence of social								
Course	Outcomes			Methods	Assessment Methods					
CO 1	Understand	social media and its analytics cy-	cle	Lecture	Group	Discussion				
CO 2	Implement	social network structure and mea	sures	Lecture	Quiz					
003	Analyze hy	perlink analytics	t to ala	Video Lessons	Semin	lar				
CO 4	Acquire sea	ich engine analytics and relevant	Video Lessons	Semin	ar					
CO 5	Create priva maintenance	acy policies, data ownership and e	y policies, data ownership and Video Lesson							
Offered	by Data S	Science	ence							
Course	Content		Iı	nstructional Hours	s / Week :5					
Unit		Description			Text Book	Chapters				
I	An Overvie Media, Soc (SMA), SM Media Ana Seven Laye Analytics, S	ew - Core Characteristics of Soci cial media landscape, Need for AA in small & large organizat lytics, Social Media vs. Traditi rrs of Social Media Analytics, Ty Social Media Analytics Cycle	ial Med Social tions. I ional B pes of t	ia, Types of Social l Media Analytics Purpose of Social usiness Analytics, Social Media	1	2,3				
	•	· · ·		Instruction	nal Hours	15				
Suggest	ed Learning	Methods: Tutorial	0	X 7• 1 • 4•						
п	Basics of Describing Density, O Network V features, S Common Types	Social Network Structure, Measure Social Networks Measures Connectivity, Centralization, Visualization - Graph Layou Scale Issues. Social Media N Network Terms, Common S	Node - Deg Tie S t, Visu etwork Social	s, Edges & Tie ree Distribution, trength & Trust talizing Network Analytics - Media Network	1	4,5				
				Instruction	nal Hours	15				
Suggest	ed Learning	Methods: Group Discussion	1		1					
III	Social Media Text, Action & Hyperlink Analytics: SocialMedia Text Analytics - Types of Social Media Text, Purpose ofText Analytics, Steps in Text Analytics, Social Media Text 8Analysis Tools Social Media Action Analytics - What Is ActionsAnalytics? Common Social Media Actions, Actions AnalyticsTools Social Media Hyperlink Analytics					6				
	LOOIS SOCI	a wedia Hyperlink Analytics	s - Ivp	es of Hyperlinks,						

	Туре	es of H	lyperlink	Analy	tics, H	yperlir	nk Anal	ytics 7	Tools.				
Instructional Hours Suggested Learning Methods :Group Discussion												15	
Suggest	ed Lea	rning	Method	ls :Gro	oup Di	scussio	on .			·			
	Socia		lia Loca	tion &	k Sear	ch Er	igine A	nalyti	ics: Loc	cation			
TT 7	Analy	tics -	Sources	s of L	ocatio	n Data	i, Cate	gories	of Loc	cation			
IV	Analy	tics,	Location	Anar	ytics a	na Pr	ivacy (_oncer	ms, Loc	cation	1		7
	Engin		orch Eng	ino An	cingine	Soor	yucs -	i ype	S 01 5		1		1
	Engin				arytics	, Searc	II LIIGI		Instr	uctiona	Hours		15
Suggest	ed Lea	rning	Method	s :Vio	leo Pr	esenta	tion		IIISti	uctiona	liittuis	,	10
	Social	l Me	dia Ana	lytics	Appli	cation	s and	Priva	cv: So	cial			
	media	in pi	iblic sec	tor - A	nalvzi	ng pul	olic sec	tor so	cial med	dia.			
T 7	analyz	zing i	ndividual	users	, case	study.	Busine	ess use	e of So	cial			1
V	Media	a - M	easuring	succe	ss, Int	eractio	n and	monit	oring, c	ase	1		1
	study.	Priva	acy - Pri	vacy p	olicies	s, data	owner	ship a	nd				
	maint	aining	privacy	online									
									Instr	uctiona	l Hours		15
			[Tota	l Hours	75	5 Hrs
			1. Goł	nar F. F	Khan, "	Seven	Layers	of So	cial Mec	lia Anal	ytics: M	ining	
Text Bo	ok		Bus	iness I	nsights	s from	Social	Media	Text, A	ctions, I	Network	s, Hype	rlinks,
-			Apr	os, Sea	rchEng	gine, ar	$\frac{1}{1}$ Loca	tion D	$\frac{\text{ata}^{\prime\prime}, W}{\Omega}$	$\frac{1}{5}$	۱. ۱.	T 1 '	
Referen	ce Boo	oks	I. Mat	thew C	Janis, A	Avinas	h Kohi	rkar, "	Social N	ledia Ai	nalytics,		ques
			and	Insign	$1S \text{ for } \mathbf{f}$	Extract	ing Bus	siness	value O	ful of So	cial Mee	na , ib	IVI
			2 Coh	58, 201 or S 70	0. ho Cu	ngor	Polotizor		oor Do	Jzin An	tonioa	ballion	oulog
			2. Uat "So	cial M	odia D	ingoi r ata Mii	olatkal	l, r. O d Anal	scal Doy	Wiley 2		патктор	joulos,
W.h. TI	DT		https://a	se jitk	$\frac{\cos 2\theta}{\cos 2\theta}$	n/~nav	vang/co	urses/	$\frac{1}{SC16}$ ht	$\frac{100}{10}$ ml			
web. U	KLS		nups.//	T .			• ung/ 00	() E N					
					DOIS IO	r Asse	ssment	(25 M	larks)				
CIA	Ι	C	IA II	C	IA III	As	signme	ent	Semina	ar	Quiz	T	otal
5	5		5		6		3		3		3		25
						Ma	apping						
CO \ PO	PO1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO2	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO3	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO4	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO5	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
H-High;	M-Me	edium;	L-Low	_	_	_							
		Cour	se desig	ned by	7				Ver	ified by	Chairn	nan	
		Dr. D). Vimal	Kumai						Dr. N.	Kavitha		

Cou	irse Code	Title							
23P0	GDTE206	Elective Paper 1	II C: Bu	siness Intelli	igenc	e			
Semeste	er: II	Credits: 4	CIA	: 25 Marks		ESE:75 M	arks		
Course	Objective	To impart a comprehensi data collection, integrat analysis using BI tools, insights.	ive unde tion, an learning	erstanding of d warehousi g to generate	BI fu ng. I repo	ndamentals Learners ca rts and der	an delve into ive actionable		
Course	Category	Employability							
Develop	ment Needs	Global							
Course	Description	The course intends to equ drive informed decisions success.	ip learne , and co	ers with the skontribute strat	tegica	o harness da Illy to orga	ata effectively, nizational		
Course	Outcomes	Teaching MethodsAssessment Meth							
CO 1	Understand business dec benefits.	BI concepts for inform cisions, yielding significa	ed int	Lecture	e	Group	Discussion		
CO 2	Comprehend business need	BI dimensions, aligning s for comprehensive insights	g with	Lecture	e	Quiz			
CO 3	Analyze and analytics, complexities.	explore BI tech: data hand AI integration, deployr	ling, nent	Video Less	sons	Semin	ar		
CO 4	Acquire BI cu informing for	lture: align human aspects, in organizational growth.	ntegrate	Tutorial Video Less	sons	Semin	ar		
CO 5	Understand S dynamics, trus	oft BI factors: focus, sense st, fostering informed process	sing.	Video Less	sons	Assig	nment		
Offered	l by Data Sci	ience							
Course	Content		In	structional I	Iours	s / Week :5			
Unit		Description				Text Book	Chapters		
I	Business Inte Activities of Results and Business Inte Business Intel Informing Act	elligence Definition and Business Intelligence - Benefits - Advanced In Iligence Information Need ligence Cycle - Business I tivities.	Proble Definition forming ls: Infor Intellige	m Space: T ons - Expec g and Insight mation Need nce and Relat	The ted nts. s - ted	1	2, 3		
				Instru	ction	al Hours	15		
Suggest	ed Learning N	Aethods: Tutorial			DI				
п	Business Int Dimensionalit and BI Dime Orientation - Complexity - Velocity - Tire	y - Business Dimensions - Relations of Business hsions - BI Dimensions: Internal and External Centralized and Decentralized BI - Question Functional Scope - Automation - Initiative - d Approaches - The Encompassing Potential of BI							
				Instru	ction	al Hours	15		
Suggest	ed Learning N	Methods: Group Discussion	on						
III	Business I	ntelligence Technologies	s: Ove	erview of	BI	1	7		

	Tech	nolog	ies - Dat	a Colle	ection	and Sto	orage -	Multic	limensi	onal			
	Analysis, Online Analytical Processing - Use of Simple Service Tools - Business Analytics - Modeling and Simulation - Text												
	1001	s - Bi	ISINESS A	Analyti	CS - M	lodelin	g and a	Simula	ttion -	tion			
	Anai Dlotf	ytics -	· The KO	le of A	I - CO u Donl	mmum	cation a		Jiiadora	lion			
	Flati		- DI Teci	molog	y Depi	loymen	11 15500	S	Instru	ictiona	Hours		15
Suggest	ed Lea	rning	Metho	ls : Gr	oun E)iscuss	ion		mstru		littours		10
	Busi	ness	Intellige	nce C	ulture:	Hum	an Fa	ctors	in Bus	iness			
	Intel	ligenc	e - Rel	ation	of Or	ganiza	tional.	Infor	mation.	and			
TT 7	Busi	ness I	ntelliger	ice Cu	ltures	- The	Import	ance of	of Infor	ming			0
IV	Activ	vities	for Org	anizat	ional	Cultur	e - Th	e Mo	st Con	nmon	1		9
	Features of Business Intelligence Culture - Research on Business												
	Intelligence Adoption in Lithuanian Companies.												
	Instructional Hour												15
Suggest	sted Learning Methods :Video Presentation												
	Soft 1	Busine	ess Intel	ligence	e Facto	ors: Co	ommon	Issue	s for S	oft			
	Factor	rs - A	ttention	Impo	rtance	for B	I - Imp	ortant	Attenti	ion			
	Issues	- Atte	ention M	anagei	nent T	Cools -	Sense:	Sense	Dynam	ics			10
V	- Sens	e Met	rics - Tr	ust: Tri	ust in I	Elemer	its of In	formi	ng Proce	ess	1		10
	- Proc	cessin	g Metho	and s and $and b$	d Syst	tems L	Design	- Con	tributor	S -			
	Direct	CS - K	elations	betwe	en Soi	t Facto	ors - Po	DSS1DIE	e Reseat	rcn			
	Difect	10115							Instru	lctions	Hours		15
									moure	Tota	Hours	75	Hrs
			1. Rin	ivvdas	Skyri	us. "Bi	isiness	Intelli	pence -	A Com	prehensi	ve	
Text Bo	ok		Ар	oroach	toInfo	rmatio	n Need	s, Tec	hnologi	es and	Culture",	Spring	er,
Approach to Information Needs, Technologies and Culture", Sp													
Referen	ce Boo	oks	202 1. J. N	1. Iark M	unoz,	"Globa	al Busir	ness In	telligen	ce", Ta	ylor and	Francis	, 2018.
Referen	ice Boo	oks	202 1. J. N 2. S. S	1. Iark M Shengh	lunoz, ai Wu	"Globa , "Busi	al Busir ness In	ness In tellige	telligen nce", W	ce", Ta Viley, 20	ylor and)15.	Francis	s, 2018.
Referen	ice Boo	oks	202 1. J. N 2. S. S https://d	1. Iark M Shengh corpora	unoz, ai Wu atefina	"Globa , "Busi nceinst	al Busir ness In titute.co	ness In tellige om/cou	telligen nce", W urse/intr	ce", Ta /iley, 20 <mark>oductio</mark>	ylor and)15. <mark>n-to-busi</mark>	Francis <u>ness-</u>	s, 2018.
Referen Web. U	ice Boo RLs	oks	202 1. J. N 2. S. S <u>https://c</u> intellig	1. Iark M Shengh corpora ence/	unoz, ai Wu atefina	"Globa , "Busi nceinst	al Busir ness In <u>titute.co</u>	ness In tellige om/cou	telligen nce", W rse/intr	ce", Ta /iley, 20 oductio	ylor and)15. n-to-busi	Francis <u>ness-</u>	5, 2018.
Referen Web. U	ice Boo RLs	oks	202 1. J. N 2. S. S https://d intellig	1. Iark M Shengh corpora ence/ To	unoz, ai Wu atefina ols for	"Globa , "Busi nceinst	al Busin ness In itute.co	ness In tellige om/cou	telligen nce'', W rrse/intr (arks)	ce", Ta Viley, 20 oductio	ylor and)15. n-to-busi	Francis ness-	s, 2018.
Referen Web. U CIA	nce Boo RLs	oks	202 1. J. N 2. S. S https://d intellig	1. Iark M Shengh corpora ence/ To C	iunoz, ai Wu, atefina ols for IA III	"Globa , "Busi nceinst r Asses As	al Busir ness In citute.co ssment ssignme	ness In tellige om/cou (25 M nt	telligen nce", W rrse/intr (arks) Semina	ce", Ta /iley, 20 oductio	ylor and)15. n-to-busi Quiz	Francis ness- Te	s, 2018.
Referen Web. U CIA	RLs	oks C	202 1. J. N 2. S. S https://d intellig	1. fark M Shengh corpora ence/ To C	iunoz, ai Wu atefina ols for IA III 6	"Globa , "Busi nceinst r Asses	al Busir ness In citute.co ssment ssignme 3	ness In tellige m/cou (25 M nt	telligen nce", W urse/intr (arks) Semina 3	ce", Ta Viley, 20 oductio	ylor and)15. n-to-busi Quiz 3	Francis ness- To	s, 2018.
Referen Web. U CIA	RLs . I	oks C	202 1. J. N 2. S. S https://d intellig TA II 5	1. fark M Shengh corpora ence/ To C	iunoz, ai Wu atefina ols for IA III 6	"Globa , "Busi nceinst r Asses As As	al Busir ness In itute.co ssment ssignme 3 apping	ness In tellige m/cou (25 M nt	telligen nce", W trse/intro (arks) Semina 3	ce", Ta Viley, 20 oductio	ylor and)15. n-to-busi Quiz 3	Francis ness- Te	otal 25
Referen Web. U CIA	RLs	Oks C	202 1. J. N 2. S. S https://d intellig CIA II 5 P03	1. Jark M Shengh corpora ence/ To C.	iunoz, ai Wu atefina ols for IA III 6	"Globa , "Busi nceinst r Asses As As Ma	al Busir ness In titute.co ssment ssignme 3 apping P07	ess In tellige (25 M nt PO8	telligen nce'', W urse/intr farks) Semina 3 PS01	ce", Ta Viley, 20 oductio	ylor and)15. n-to-busi Quiz 3	Francis ness- Te	e, 2018.
Referen Web. U CIA	RLs I PO1 H	PO2 H	202 1. J. N 2. S. S https://d intellig CIA II 5 PO3 H	1. fark M Shengh corpora ence/ To C. PO4 M	iunoz, ai Wu atefina ols for IA III 6 PO5 H	"Globa , "Busi nceinst r Asses As As PO6 M	al Busir ness In itute.co ssment ssignme 3 pping P07 H	ness In tellige m/cou (25 M nt PO8 H	telligen nce", W urse/intro (arks) Semina 3 PSO1 H	ce", Ta Viley, 20 oductio	ylor and)15. n-to-busi Quiz 3 PSO3 H	Francis ness- Te PSO4 M	otal 25 PSO5 H
Referen Web. U CIA CO\PO CO1 CO2	RLs I F PO1 H H	PO2 H H	202 1. J. N 2. S. S https:/// intellig CIA II 5 PO3 H H	1. fark M Shengh corpora ence/ To C. PO4 M M	iunoz, ai Wu, atefina ols for IA III 6 PO5 H H	"Globa , "Busi nceinst r Asses As As PO6 M M	al Busir ness In titute.co ssment ssignme 3 apping P07 H H	ess In tellige (25 M nt PO8 H H	telligen nce", W urse/intr farks) Semina 3 PSO1 H H	ce", Ta Viley, 20 oductio	ylor and)15. n-to-busi Quiz 3 PSO3 H H H	Francis ness- Te PSO4 M M	e, 2018. etal 25 PSO5 H H
Referen Web. U CIA CO\PO CO1 CO2 CO3	RLs I PO1 H H H	ро 2 Н Н	202 1. J. N 2. S. S https://d intellig CIA II 5 PO3 H H H	1. fark M Shengh corpora ence/ To C. PO4 M M M	iunoz, ai Wu atefina ols for IA III 6 PO5 H H H	"Globa , "Busi nceinst r Asses As PO6 M M M	al Busir ness In itute.co ssment ssignme 3 pping P07 H H H	ress In tellige m/cou (25 M nt PO8 H H H	telligen nce", W rrse/intro (arks) Semina 3 PSO1 H H H	r PSO2 H H H	ylor and)15. n-to-busi Quiz 3 PSO3 H H H H	Francis ness- To PSO4 M M M	e, 2018. etal 25 PSO5 H H H H
Referen Web. U CIA CO\PO CO1 CO2 CO3 CO4	RLs I FOI H H H H	PO2 H H H H H	202 1. J. N 2. S. S https:/// intellig CIA II 5 PO3 H H H H	1. fark M Shengh corpora ence/ To C. PO4 M M M M	iunoz, ai Wu atefina ols for IA III 6 PO5 H H H H H	"Globa , "Busi nceinst r Asses As As PO6 M M M M	al Busir ness In citute.co ssment ssignme 3 pping P07 H H H H	ress In tellige m/cou (25 M nt PO8 H H H H	telligen nce", W urse/intr farks) Semina 3 PSO1 H H H H	r viley, 20 oduction oduction r vr PSO2 H H H H H	ylor and)15. n-to-busi Quiz 3 PSO3 H H H H H	Francis ness- Te PSO4 M M M M	e, 2018. etal 25 PSO5 H H H H
Referen Web. U CIA CO\PO CO1 CO2 CO3 CO4 CO5	RLs I FOI H H H H H	ро2 Н Н Н Н Н	202 1. J. N 2. S. S https://d intellig CIA II 5 PO3 H H H H H	1. fark M Shengh corpora ence/ To C PO4 M M M M M M	iunoz, ai Wu atefina ols for IA III 6 PO5 H H H H H H	"Globa , "Busi nceinst r Asses As Ma Ma M M M M	al Busir ness In itute.co ssment ssignme 3 apping P07 H H H H H	ress In tellige m/cou (25 M nt PO8 H H H H H H	telligen nce'', W urse/intr farks) Semina 3 PSO1 H H H H H	r viley, 20 oduction	ylor and)15. n-to-busi Quiz 3 PSO3 H H H H H H	Francis ness- To PSO4 M M M M M	e, 2018. etal 25 PSO5 H H H H H H
Referent Web. U CIA CO\PO CO1 CO2 CO3 CO4 CO5 H-High;	PO1 H H H H H H H H H H	PO2 H H H H H H cdium	202 1. J. N 2. S. S https:/// intellig CIA II 5 PO3 H H H H H H H H H H H	1. fark M Shengh corpora ence/ To C. PO4 M M M M M M	iunoz, ai Wu atefina ols for IA III 6 PO5 H H H H H H H	"Globa , "Busi nceinst r Asses As PO6 M M M M M	al Busin ness In citute.co ssment ssignme 3 apping PO7 H H H H H	ess In tellige m/cou (25 M nt PO8 H H H H H H	telligen nce", W urse/intr farks) Semina 3 PSO1 H H H H H	r viley, 20 oduction oduction r vr PSO2 H H H H H H	ylor and)15. n-to-busi Quiz 3 PSO3 H H H H H H H	Francis ness- Te PSO4 M M M M M	e, 2018. etal 25 PSO5 H H H H H H
Referen Web. U CIA CO\PO CO1 CO2 CO3 CO4 CO5 H-High;	RLs RLs I FO1 H H H H H H H	PO2 H H H H H Cour	202 1. J. N 2. S. S https://d intellig TA II 5 PO3 H H H H H H H S tLow se desig	1. fark M Shengh corpora ence/ To C PO4 M M M M M M	iunoz, ai Wu, atefina ols for IA III 6 PO5 H H H H H H	"Globa , "Busi nceinst r Asses As P06 M M M M M	al Busir ness In itute.co ssment ssignme 3 apping P07 H H H H H	ress In tellige m/cou (25 M nt PO8 H H H H H H	telligen nce'', W urse/intr farks) Semina 3 PSO1 H H H H H H	r viley, 20 oduction	ylor and)15. n-to-busi Quiz 3 PSO3 H H H H H H H	Francis ness- Te PSO4 M M M M M M	e, 2018. etal 25 PSO5 H H H H H

Cou	irse Code	Title								
23P(GDTC307	C307 Paper VII: Information Retrieval Techniques								
Semeste	er: III	Credits: 4	CIA:	25 Marks	ESE:75 M	larks				
Course	Objective	To equip students with c techniques, spanning tex retrieval.	compre xt sear	chensive know ch algorithms	ledge of inforn and multimed	nation retrieval ia information				
Course	Category	Skill Development								
Develop	ment Needs	Global								
Course	Description	This course delves in information from vast d search algorithms and th covering spoken languag video retrieval.	nto the ata rep ne intri ge aud	e principles positories. The cacies of mult lio, non-speecl	and methods course explor imedia inform audio, graph	of retrieving es various text ation retrieval, , imagery, and				
Course	Outcomes		Assessme	nt Methods						
CO 1	Understand inf its search capa	formation retrieval systems and bilities	rmation retrieval systems and Lecture							
CO 2	Implement cat	aloging and indexing techniqu	es	Lecture		Quiz				
CO 3	Analyze auto clustering and	omatic indexing mechanism hierarchy of clusters	ns,	Video Lesso	ons S	eminar				
CO 4	Acquire know information se	ledge on user search technique arch	es and	/ Tutorial Video Lesso	ons S	eminar				
CO 5	Create informa search techniq information re	ation retrieval systems using t ues and make use of multime trieval methods	text edia	Video Lesso	ons As	signment				
Offered	by Data Sci	ence								
Course	Content		In	structional H	ours / Week :	4				
Unit		Description			Text Book	Chapters				
Ι	Introduction to Objectives of Overview, Re Digital Librar System Capab Miscellaneous	o Information Retrieval System f Information Retrieval elationship to Database Maies and Data Warehouses. bilities: Search Capabilities, Capabilities	stems: Syster Ianage Inform Brow	Definition an ns, Functiona ment System nation Retrieva se Capabilities	d al s, 1 al s, 1	3, 4				
Suggest	ad Looming N	lethedge Tutorial		Instruc	tional Hours	12				
Suggest	Cataloging an	d Indexing: History and Ol	hiectiv	es of Indexin	τ					
II	Indexing Proc Introduction to File Structure,	rocess, Automatic Indexing, Information Extraction. n to Data Structure, Stemming Algorithms, Inverted ure, N-Gram Data Structures								
~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~				Instruc	tional Hours	12				
Suggest	ed Learning M	Learning Methods: Group Discussion								
III	Automatic Indexing: Classes of Automatic Indexing, Statistical Indexing, Natural Language, Concept Indexing, Hypertext19, 11									

	Linkages. Document and Term Clustering: Introduction to Clustering, Thesaurus Generation, Item Clustering, Hierarchy of Clusters.												
I	Clusie								Instr	uction	nal Hour	8	12
Suggest	ed Lea	rning	g Methoo	ls : Gi	roup D	Discuss	sion			<u>ucuoi</u>			
IV	User Simila Disser Boole	Searc arity N minati an Sys	ch Tech Ieasures on of I stems, Se	niques and R nformation	S: Sea anking ation ng the l	rch S , Rele ⁻ Search INTEF	tateme vance I , Weig NET a	nts Feedt ghtec and H	and Bin back, Sel I Search Iypertext	nding, ective es of	1	13,	15, 16
-		ž	, , , , , , , , , , , , , , , , , , ,		0				Instr	uctior	nal Hour	5	12
Suggest	ed Lea	arning	g Methoo	ls :Vi	deo Pi	resenta	ation				T		
V	Text Techn Search Langu Retrie	Search niques, h Sys nage A eval, In	ch Algo , Softwar tems. M .udio Ret nagery F	orithm re Tex lultime rieval, Retriev	s: Int t Searc edia Ir Non-S al, Vid	roduct ch Alg forma Speech leo Ret	tion to orithms tion R Audio trieval.	o T s, Ha etrie ^v Retr	ext Sea rdware 7 val: Spo ieval, Gr	arch Fext ken aph	1	1	7, 18
									Instr	uctior	nal Hour	5	12
										To	tal Hour	s 60	Hrs.
Text Bo	oks		1. Ch "Ir 20	ristopl ntroduc 17.	her D. ction to	Manni o Infor	ng, Pra mation	ibhak Retr	tar Ragh ieval", C	avan, a Cambri	and Hinric dge Unive	ch Schut ersity Pr	zze, ress,
Referen	ice Boo	oks	1. Pra 2. J.	abhaka Cambe	r Ragł rson, '	navan, 'Inforr	"Retrie	eval] Retri	Fechniqu eval Stor	ies", P ry", W	HI, 2015. 'iley, 2014	ŀ.	
Web. U	RLs		https://v	www.g	geeksfo	orgeek	s.org/w	hat-i	s-inform	ation-	retrieval/		
				To	ols for	Asses	ssment	(25)	Marks)				
CIA	I	C	SIA II	C	IA III	A	ssignme	ent	Semin	ar	Quiz	Т	otal
	5		5		6		3		3		3		25
						Ma	apping						
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	POS	B PSO1	PSO	2 PSO3	PSO4	PSO5
CO1	Н	Н	H	M	H	М	Н	Н	H	Н	Н	М	Н
CO2	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO3	Н	H	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO4	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO5	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
H-High;	M-Me	edium	; L-Low								I		
		Cour	se desig	ned by	7				Ve	rified	by Chair	man	
		Dr. I	B. Narasi	mhan						Dr. N	I. Kavitha		

Cou	irse Code	Title								
23P0	GDTC308	Paper VIII: Exploratory Data Analysis								
Semeste	er: III	Credits: 4	CIA:	25 Marks	ESE:75 M	arks				
Course	Objective	To equip learners with con (EDA) using various visual explore into data transform	mpreh l aids a nation	ensive skills in and transformati methods.	Exploratory on techniques	Data Analysis 5. Students will				
Course	Category	Skill Development								
Develop	oment Needs	Global	Global							
Course	Description	Focuses on single-variable summaries, scaling, and ine two variables using percent	e analy equalit tage ta	sis, discussing ies, while addre bles, scatterplo	distributions, ssing relation s, and transfo	numerical ships between ormations.				
Course	Outcomes			Teaching Methods	Assessme	nt Methods				
CO 1	Understand transformation tabulations.	fundamentals of EDA, n techniques and cross	, 5	Lecture	Group	Discussion				
CO 2	Implement visualization a	three-dimensional plo and seaborn.	otting,	Lecture		Quiz				
CO 3	Analyze single time series dat	e variable and perform smoothir ta for EDA.	ng	Video Lessor	is S	eminar				
CO 4	Acquire know handling and j	ledge on relationships, batch perform transformations.		Tutorial / Video Lessor	IS S	eminar				
CO 5	Create time-b resampling.	ased indexing, visualizing an	nd	Video Lessor	is Ass	signment				
Offered	by Data Sci	ience								
Course	Content		In	structional Ho	urs / Week :	4				
Unit		Description			Text Book	Chapters				
I	EDA fundar Significance of with classical - Visual Aid merging data techniques - G and cross-tabu	mentals – Understanding of EDA – Making sense of dat and Bayesian analysis – Sof ls for EDA- Data transfor base, reshaping and pivoti brouping Datasets - data aggre- ilations.	g data ta – Co ftware rmatic ing, T egation	a science – omparing EDA tools for EDA on techniques- Transformation n – Pivot tables	1	3, 4				
				Instructi	onal Hours	12				
Suggest	ed Learning N	Aethods: Tutorial	C:	1						
п	 - visualizing errors – density and contour plots – Histograms – - legends – colors – subplots – text and annotation – - customization – three dimensional plotting - Geographic Data with Basemap - Visualization with Seaborn. 									
				Instructi	onal Hours	12				
Suggest	ed Learning N	Aethods: Group Discussion								

	Introduction to Single variable: Distributions and Variables - Numerical Summaries of Level and Spread - Scaling and 1 9,11												
111	Nume	rıcal	Summar	ies of	Leve	l and	Spread	1 - So Somios	caling a	ind	1	9	9,11
	Standa	ardizii	ng – Ineq	uanty	- Smo	otning	Time s	series.	Instru	ictiona	1 Hours		12
Suggeste	ed Lea	rning	Method	ls : Gr	oup D	iscuss	ion		mout	i cuona	1 110015		12
	Relati	onshij	os betwe	en Tv	vo Va	riables	- Perc	centag	e Table	s -			
IV	Analy	zing (Continge	ncy T	ables -	- Hanc	iling S	everal	Batche	s -	1	13,	15, 16
	Scatte	rplots	and Res	istant l	Lines -	- Trans	sformat	ions.					
									Instru	ictiona	l Hours		12
Suggeste	ed Lea	rning	g Method	ls :Vi	deo Pr	resenta	ation			F			
	Introd	ucing	a Third	Varia	ble - (Causal	Expla	nation	is - Thr	ee-			
X 7	Variat	ole Co	ntingenc	y Tabl	les and	Beyon	nd - Loi	ngitud	inal Dat	a –	1	1'	7 10
v	Funda Data (Tleani	us of 13 ng Tim	A – C	_narac	ving	S OI UI Vieual	ine sei	Groupi	1 – ng	1	1	/, 18
	– Resa	amplin	ng – 1 m 1g.	c-base	a mue	Allig –	v isuai	izing	Group	ing			
	Instructional Hours 12												
										Tota	l Hours	60	Hrs.
Text Bo	ok		1. John Pub	n W. T lishing	`ukey, gComp	"Exploant of the second	oratory 022. (R	Data A	Analysis 12 th Ed	s", Add ition)	ison-We	sley	
			1. And	lrew G	elman	and Je	ennifer	Hill, "	Explora	tory D	ata Analy	vsis Usi	ng
Referen	ce Boo	oks	Reg	ression	n and I	Multile	evel/Hie	erarch	ical Moo	dels", C	Cambridg	e Unive	ersity
			Pres	ss,2017	7.								_
			2. Wei	$\frac{1}{1}$ hdy L.	Martin	iez, Ai	ngel R.	Marti	nez, Jefi	frey So	lka, "Exp	olorator	y Data
			Ana https://x	uysis v		AILA	$\mathbf{B}^{\prime}, \mathbf{C}^{\mathbf{F}}$	C Pre	$\frac{255}{201}$		tomial/and	lanatan	r, data
Web. Ul	RLs		analysis	<u>v w w .s</u>	impine	am.co	<u>m/tuto</u>	<u>(1815/U</u>	<u>ata-anar</u>	<u>ytics-tu</u>	torial/ex	piorator	<u>y-data-</u>
			<u>anarys</u>	2									
				То	ols for	Asses	sment	(25 M	larks)				
CIA	I	C	IA II	C	IA III	As	ssignme	ent	Semina	ır	Quiz	Т	otal
5	5		5		6		3		3		3		25
						Ma	pping						
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	H	М	Н	М	Н	Н	H	Н	Н	М	Н
CO2	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO3	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO4	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO5	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
H-High;	gh; M-Medium; L-Low												
		Cour	se desigi	ned by	•				Ver	ified by	y Chairn	nan	
		Dr	. N. Kav	itha						Dr. N.	Kavitha		

Cou	ırse Code	Title								
23P	GDTC309	FC309 Paper IX: Data Privacy and Security UL Creditor 4								
Semest	er: III	Credits: 4	CIA	: 25 Marks	E	SE:75 M	arks			
Course	Objective	To understand the importa the privacy preservation m	nce of nethods	data privacy a s for protecting	nd sec g vario	curity and ous kinds	to learn about of data.			
Course	Category	Skill Development								
Develop	oment Needs	Global								
Course	Description	This course will equip stu navigate the complex lan today's digital age.	idents idscape	with the know e of safeguard	ledge ling s	and skills ensitive in	s necessary to nformation in			
Course	Outcomes			Teaching Methods		Assessmer	nt Methods			
CO 1	Understand t	he need for data sharing.		Lecture		Group	Discussion			
CO 2	Analyze the preserving m	necessity of different privac ethods	cy-	Lecture			Quiz			
CO 3	Apply the pr various types their perform	ivacy-preserving methods f s of data and evaluate ance	for	Video Lesso	ons	Se	eminar			
CO 4	Remember and identify	nd evaluate the security poli the system vulnerabilities	cies	Tutorial / Video Lesso	/ ons	Seminar				
CO 5	Assess the information s for device ma	security by applying security policies and standa anagement	the ards	Video Lesso	ons	Ass	ignment			
Offered	l by Data Sci	ience								
Course	Content		In	structional H	ours	/ Week :4				
Unit		Description				Text Book	Chapters			
Ι	Data Privacy Methods of P Privacy and U Principles - D Anonymization Classification Data in a Anonymization	and its Importance - Need rotecting Data – Importance Jtility – Introduction to An Nature of Data in the Er on on Multidimensional I of Privacy Preserving Metho Multidimensional Data Son	d for S ce of H nonym nterpris Data: Ods - C Set -	Sharing Data Balancing Data ization Design se Static Data Introduction lassification of Group-Based	- a 1 a - f 1	1	1, 2			
	· · · · ·		tional	l Hours	12					
Suggest	ted Learning N	Iethods: Tutorial								
п	II Preserving Time Series Data – Privacy Preservation of Longitudinal Data - Privacy Preservation Data – 1 Static Data Anonymization: Threats to Anonymized Data – Threats to Data Structures - Threats by Anonymization Techniques.					3, 4				
				Instruc	tiona	l Hours	12			

Suggest	ed Lea	rning	g Method	ls: Gr	oup Di	iscuss	ion						
ш	Introd Data I Data Portab Protec Design Sensit	uction Protec Secur bility a ction - n for ive Da	n - UK D tion of S ity Stand and Acco - Anonyn HIPAA ata Ano	Pata Pr witzer lard (1 untabi nizatio - Explonymiz	Potectic land 1 PCI D lity Ac on Con licit Id zation	on Act 992 - SS) - t of 19 nsidera lentific Desig	1998. Payme The 1 996 (H1 ations ers - Q n Checl	- Fed ent Ca Health IPAA) - Ano Juasi-I klist.	eral Act rd Indus Insurar Effects nymizati dentifier	of try nce of ion s -	1		9
									Instru	iction	al Hours		12
Suggest	ed Lea	rning	g Method	ls : Gr	oup D	iscuss	sion						
IV	Securi Data - Unstru Data. Techn	ing Ui - At F icture Infori ology	nstructure Rest, in T d Data – mation R Details -	ed Dat Transit Newer ights - Getti	ta: Stru and ir r Appro Manag ng Sta	acture 1 Use 1 Use 10 aches 13 gemen 14 gemen 14 cture 14	d Data – Appi s to Sec t: Ovei vith IRM	vs. U roache cure U rview M.	nstructur s to secunstructur – IRM	red ure red	2		4
									Instru	iction	al Hours		12
Suggest	ed Lea	rning	g Method	ls :Vi	deo Pr	resenta	ation						
v	Storag Reme Conce – Dat Monit	ge Sec diation pts – l abase oring	urity: Ev n – Bes Database Backup	olution t Prace Securities and I	n – Mo ctices. ity Lay Recove	odern Datal vers – l ery –	Storage base S Databas Databa	e Secu ecurit se-Lev ise Ai	urity – R y: Gene vel Secur uditing a	isk eral ity und	2		5
	1010111	oning							Instru	iction	al Hours		12
										Tota	al Hours	60	Hrs.
Text Bo Referen	oks ce Boo	oks	1. V P 2. R <u>R</u> 1. W	enkata rincipl hodes <u>eferen</u> Villiam ndPrac	aramar lesand -Ousle <u>ace,Mc</u> a Stalli ctice",	lan, N Practi y, Ma <u>Graw-</u> ngs, L Pearso	ataraj, a ce", CH rk. Info <u>Hill, 2</u> awrie I on, 2014	and A RC Pre ormation 018. Brown 4.	shwin Sl ess, 2019 on Secur	oriram). ity: Th outer S	, "Data Pr ne Comple ecurity: P	ivacy: ete rinciple	s
			2. Ja P	ames I ress, 2	2 Schau 013.	ıb, Ke	en D Bi	ery, "	Ultimate	Comp	outer Secu	rity", C	RC
Web. U	RLs		https://v	vww.il	bm.cor	n/topi	cs/data	-secur	<u>ity</u>				
				To	ols for	Asse	ssment	: (25 N	farks)				
CIA	I	C	TA II	C	IA III	A	ssignme	ent	Semina	r	Quiz	Т	otal
5			5		6		3		3		3		25
						Ma	apping						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
	H	H	H H	M	H H	M	H	H	H	H	H	M	H
002	H U	н u	н ц	M	 ц	M	H	H 	и	H	H	M	H
CO3	11	11	11	IVI	11	М	H	H	11	Н	Н	М	Н
CO4	H	Н	H	М	H	М	Н	Н	H	Н	Н	М	Н
CO5	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
H-High;	M-Me	dium;	; L-Low										
		Cour	se desigr	ned by					Ver	ified b	y Chairm	an	
		Dr	. N. Kavi	tha						Dr. N.	Kavitha		

Cou	rse Code			Title		
23P	GDTC310	Paper X:	Probab	oility and Inferentia	l Statisti	ics
Sen	nester: III	Credits: 4	CI	A: 25 Marks	ESE:	75 Marks
Course	Objective	To Understand the Probab the principles of statistical	ility the metho	eory and to forecast ds.	the future	e events using
Course	Category	Employability				
Develo	pment Needs	Global				
Course	Description	This course helps in mal data set based on the smal	king pro	edictions or general	izations	about a larger
Course	Outcomes			Teaching Methods	Assessm	nent Methods
CO 1	Understand theory	the principles of prob	ability	Lecture /Video Lessons	Ass	ignment
CO 2	Demonstrat different di	e the conceptual knowledge stributions.	e of	Lecture	Sen	ninar
CO 3	Establish the	e effect of independent varia variable using experimental d	ble on esigns	Lecture/Video Lessons	Sen	ninar
CO 4	Analyze the	e business forecasting techniq	ues	Tutorial / Video Lessons	Sen	ninar
CO 5	Perform mu	ılti variable Regression analy	sis.	Lecture	Ass	ignment
Offered	l by Mathe	matics				
Course	Content			Instructional Hou	rs / Weel	k:5
Unit		Description			Text Book	Chapters
Ι	Probability a Introduction	nd Expected value: a to Probability Theory: Sa	imple s	space and events.		
	Mathematic	Probability, conditional prob al Expectations.	bability.	, Baye's theorem,	1	1
	Mathematic	Probability, conditional prob al Expectations.	bability.	, Baye's theorem, Instructional	1 Hours	1
Sugges	axioms of Mathematic	Probability, conditional prob al Expectations. Methods:Tutorial	bability.	, Baye's theorem, Instructional	1 Hours	1 15 03Hrs
Sugges	ted Learning Theoretical I Binominal I distribution Poisson dist Normal Dist	Probability, conditional prob al Expectations. Methods:Tutorial Distributions: Distribution - Obtaining Coeff Poison Distribution - Fitting ribution as an approximation ribution.	icient – a Pois of bino	Baye's theorem, Instructional -Fitting a binomial son distribution – mial distribution -	1 Hours 1	1 15 03Hrs 2
Sugges	ted Learning Theoretical I Binominal I distribution Poisson dist Normal Dist	Probability, conditional prob al Expectations. Methods:Tutorial Distributions: Distribution - Obtaining Coeff Poison Distribution - Fitting ribution as an approximation ribution.	icient – a Pois of bino	Baye's theorem, Instructional Fitting a binomial son distribution – mial distribution - Instructional	1 Hours 1 Hours	1 15 03Hrs 2 15
Sugges II Sugges	axioms of Mathematic ted Learning Theoretical I Binominal I distribution Poisson dist Normal Dist	Probability, conditional probability, conditional probability, al Expectations. Methods:Tutorial Distributions: Distribution - Obtaining Coeff Poison Distribution - Fitting ribution as an approximation ribution. Methods: Problem solving	icient – a Pois of bino	Baye's theorem, Instructional Fitting a binomial son distribution – mial distribution - Instructional	1 Hours 1 Hours	1 15 03Hrs 2 15 03Hrs
Sugges II Sugges	ted Learning Theoretical I Binominal I distribution Poisson dist Normal Dist ted Learning Experimenta Experimenta Latin square Statistical Q Control chan management	Probability, conditional probability, conditional probability, al Expectations. Methods:Tutorial Distributions: Distribution - Obtaining Coefficient Poison Distribution - Fitting ribution as an approximation ribution. Methods: Problem solving I Designs and Statistical Qualiant al Designs: Introduction – Restandomized blocks Vs La puality Control: Introduction for the Standard deviation ts for the Standard deviatio ts for P – Advantages and L – Acceptance sampling.	icient – a Pois of bino ity Con andom tin squa n – Con n – Con	Fitting a binomial son distribution – mial distribution – Instructional trol: ized block design – ares. trol charts –Types – ntrol charts for C – ons – Total Quality	1 Hours 1 Hours	1 15 03Hrs 2 15 03Hrs 6, 7

Instructional										al Hours	1	5		
Suggest	Suggested Learning Methods :Group Discussion/Video lecture										T	031	Hrs	
IV	Busin Busin in fo forect Statis	ness For ness For recastin asting – stical D ems – C	ecastir recast g – N Cauti ecision	ng and S ing: Ir Aethods ons wh n Theo Il decisi	Statistic ntroduc of fo ile usir ry: Int	cal Deci ction – precasting fore roduct	ision 7 Role ng – castin ion - 3	Theory of fo Theo g tech Ingrec	y: rec rie nie	casting - s of Bu ques. nts of de	– stej usine ecisio	ps ss 1 on	8, 1	0
	proor		punie		0115.					Tre atress			1	5
Suggested Learning Methods :Group Discussion/Video Lecture											al nours	03	S Hrs	
V	Partia Partia Analy	l and M al Corre ysis (upt	ultiple elation to 3 va	Correl – Mul ariables	ations: htiple () – Rel	Correla iability	tion . of es	- Mul stimat	tip es.	le Regi	ressic	on 1	<u> </u>)
										Instru	ction	al Hours	1	5
Suggest	ed Lea	rning N	Metho	ds : Pr	oblem	Solvir	ng						03	Hrs
			1								Tot	al Hours	75]	Hrs
Text Bo	ook]	I. Statis	stical M	lethods,	, S. P.	Gupta	, Sı	ultan Ch	and a	nd Sons, Ne	w Delhi,	, 2021.
Referen	ice Boo	oks]	l. R.S.I & C	N. Pill ompar	ai, Bag 1y, 201	gavath 3.	ni, "St	ati	stics Th	neory	and Pract	ice, S. (Chand
Web. U	RLs		Rela	ated Or	nline (Conten	ts [M	00 C	, S	WAYA	M , N	NPTEL, W	ebsites	etc.]
				То	ols for	·Asses	smen	t (25]	Ma	arks)				
CIA	I	CIA	II	CIA	III	Ass	ignm	ent		Semina	r	Unit Test	To	tal
	5	5	5		6		3			3		3		25
						Ma	pping	5						
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PC)8	PSO1	PSC	PSO3	PSO4	PSO5
CO1	Н	Н	М	М	М	L	Μ	Н	[Н	M	М	Н	Н
CO2	Н	Н	М	М	М	L	М	Н	[Н	Μ	М	Н	М
CO3	Н	Н	М	М	М	L	М	Н	[M	Μ	Н	Н	Н
CO4	Н	Н	М	М	М	L	М	Н	[Н	Н	Н	М	Н
CO5	Н	Н	М	М	М	L	М	Н	[Н	Μ	Н	М	Н
H-High:	; M-Me	edium; I	L-Low	,										
		Cours	e desig	gned by	y					Veri	fied	by Chairm	an	
	Ι	Dr. T. C	handra	apushpa	ım]	Dr. N	I. Kavitha		

Cours	se Code	Title							
23P0	GDTQ305	Prac	tical V: Ex	xploratory Dat	a Ana	lysis			
Sem	ester: III	Credits: 4	CIA	:40 Marks		ESE: 6) Marks		
Course (Objective	To perform exploratory	y data anal	ysis by identify	ing the	e right to	ol		
Course (Category	Skill Development							
Develop	ment Needs	Global							
Course I	Description	Students will learn and using Python.	l gain prac	tical exposure t	o expl	oratory o	lata analysis		
Course (Outcomes			Teaching Meth	nods	Assessm	ent Methods		
CO 1	Learn to im and linear r	earn to implement coorelation, scatter plots d linear regression Demonstration Assignment							
CO 2	Learn to con and MLR	nduct T-Test, categorical	features	Demonstrati	ion	S	eminar		
CO 3	Learn to im Bivariate a	plement OLS, Univariate, nd Multivariate analysis	,	Demonstrati	ion		Quiz		
CO 4	Learn to im	plement univariate statisti	cs	Demonstrati	ion	S	eminar		
CO 5	Learn to im Python too	plement one-way ANOV	A using	Demonstrati	ion		Quiz		
Offered	by Data S	cience							
Course (Content		Iı	nstructional Ho	ours /	Week :	1		
Unit			Descrip	tion					
1.	Program to	o demonstrate Correlation	and P-value	ue concepts					
2.	Program to	o display Scatterplots							
3.	Program to	o demonstrate Linear Reg	ression						
4.	Program to	o conduct T-Test							
5.	Program to	elucidate Categorical fea	atures						
6.	Program to	o demonstrate MLR with	dummy co	des					
7.	Program to	o demonstrate OLS							
8.	Program to	o demonstrate Univariate	analysis						
9.	Program to	o demonstrate Bivariate st	atistics						
10.	Program to	o demonstrate Multivariate	e analysis						
11.	Program to	Program to demonstrate Univariate statistics							
12.	Program to demonstrate one - way ANOVA								
Suggeste	d Learning	Methods : Video lecture	es						
				r ·	Fotal	Hours	60 Hrs		

Text Boo	k		1. B	. Ben Fry, "Visualizing Data", O"Reilly Media, Inc., 2017.									
Referenc	e Book	ζS	1. S M 2. C V	cott M Iedia, ole N ïsuali	Iurray, Inc., 20 ussbaur zation ("Intera 13. ner Kn Guide f	ctive c aflic, ' for Bus	lata visi 'Storyte siness P	ualizati elling w Professi	on for th vith Data onals", V	e web", - A Da Viley, 2	O"Reil ta 012.	ly
Web. UR	RLs		https:	.//wwv	w.geeks	sforgee	ks.org	$\frac{1}{10}$ Mo	I-data-V	visualizat	tion-tuto	orial/	
Laboratory PerformanceLaboratory PerformanceLaboratory PerformanceCaboratory Performance									vation Book				
5			5			5		1	0	10		5	
						Maj	pping						
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	Н	Η	Н	М	Н	М	Н	Н	Н	Н	Н	М	Η
CO2	Н	Н	Н	Μ	Н	М	Н	Н	Н	Н	Н	М	Η
CO3	Н	Η	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO4	H	H	H	M	H	M	H	H	H	H	Н	M	H
CO5	Н	H	Н	М	Н	М	Н	Н	Н	Н	Н	M	Н
H-High; I	M-Med	lıum; L	-Low										
		Course designed by Verified by Chairman											
		Dr. B.	Narasi	imhan						Dr. N. K	avitha		

Cours	se Code		Title								
23PGI	DTQ306	Practic	cal VI: Da	ata Visualization u	ising Power	·BI					
Sem	ester: III	Credits: 4	CIA	:40 Marks	ESE: 60	Marks					
Course O	bjective	To perform data visuali	ization usi	ing Power BI							
Course C	Category	Skill Development									
Developm	nent Needs	Global									
Course D	escription	Students will learn and experiments using Pow	gain prac er BI tool	ctical exposure to c	onduct data	visualization					
Course O	Outcomes			Teaching Methods	Assessmen	t Methods					
CO 1	Learn to us cleaning, fi	e connect various data sou ltering and formatting oper	rces, rations.	Demonstration	Ass	ignment					
CO 2	Understand variouskin	to manipulate data, handle d of data formats.	manipulate data, handle Demonstration Seminar f data formats. dge to combine multiple Image: Combine multiple Image: Combine multiple								
CO 3	Apply know tables, pive	vledge to combine multiple otingand structured format	data formats. Demonstration Seminar lge to combine multiple gand structured formatting. Demonstration Quiz several kind of charts Demonstration Seminar								
CO 4	Learn to dr	aw several kind of charts	gand structured formatting.DemonstrationQuizeveral kind of chartsDemonstrationSeminarra raportDemonstrationQuiz								
	Create sup	erstore report		Demonstration		Quiz					
Offered t	by Data S	Science	-		/ **/ * -						
Course C	ontent			structional Hours	5 / Week : 5						
Unit	Descences	•	Descrip	ption	-la d'a sulsta	harra Erral					
1.	files, and	web data.		ous data sources, m	cluding data	idases, Excel					
2.	Program u	using powerquery for clean	ning and fi	iltering data to prep	oare it for an	alysis.					
3.	Program u and forma	using powerquery for work utting.	ting with t	text data, including	text extract	ion, splitting,					
4.	Program u calculatio	using powerquery for mani ns and formatting.	pulating o	date and time data,	including da	ite					
5.	Program u aggregati	using powerquery for hand	ling nume	eric data, performir	g calculation	ns, and					
6.	Program u merges.	ising powerquery combining	ng data fr	om multiple tables	through joir	is and					
7.	Program u format.	using powerquery transform	ning data	by pivoting tables	into a more	structured					
8.	Program u refreshing	using powerquery to build a data.	automated	d data transformatio	on workflow	vs and					
9.	Import su	fficient data and use colum art and ribbon chart in Pow	nn chart, s ver BI.	tacked column cha	rt, pie chart,	donut chart,					
10.	Import su number fo	fficient data and demonstra prmatting in Power BI.	ate condit	ional formatting, cl	nange aggreg	gations,					
11.	Import ap	propriate dataset and create a superstore report in Power BI.									
12.	Create a d	ashboard in Power BI for a	any applic	cation of your choic	ce.						
Suggestee	d Learning	Methods : Video lectures									
				Tota	l Hours	75 Hrs					
Text Boo	k	1. Ben Fry, "Visualizi	ng Data",	O"Reilly Media, I	nc., 2017.						

Reference Books 1. Scott Multay, Interactive data visualization for the web , O Remy Media, Inc., 2013. 2. Cole Nussbaumer Knaflic, "Storytelling with Data - A Data Visualization Guide for Business Professionals", Wiley, 2012. Web. URLs https://www.geeksforgeeks.org/Power BI-data-visualization-tutorial/ Tools for Assessment (40 Marks)											lly alization		
Laboratory PerformanceLaboratory PerformanceLaboratory Performance – 									vation Book				
5			5		5			1	0	10		5	
						Ma	pping						
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	Н	Μ	Н	М	Н	Н	Н	Н	Н	М	Н
CO2	Н	Н	Н	Μ	Н	М	Н	Н	Н	Н	Н	М	Н
CO3	Н	Н	Н	Μ	Н	М	Н	Н	Н	Н	Н	М	Н
CO4	Н	Н	Н	Μ	Н	М	Н	Н	Н	Н	Н	М	Н
CO5	Н	Н	Н	Μ	Н	М	Н	Н	Н	Н	Н	М	Н
H-High; M	H-High; M-Medium; L-Low												
Course designed by								Verified by Chairman					
		Dr. Ju	liet Ro	zario				Dr. N. Kavitha					

Cot	irse Code			Title				
23P0	GDTE307	Elective Pape	r III A:	Natural Lang	guage Process	ing		
Semest	er: III	Credits: 4	CIA	25 Marks	ESE:75 N	larks		
Course	Objective	To understand algorith	ims for t	he processing	of linguistic in	formation and		
Course	Category	Entrepreneurship		turar language	3.			
Develop	oment Needs	Global						
Course	Description	This course provides a techniques, and applica build, and deploy NLP	a compr ations of system	ehensive intro f NLP, empow s effectively.	duction to the ering students	key concepts, to understand,		
Course	Outcomes	Teaching Methods Assessment Metho						
CO 1	Describe the syntax, pragmatics	he concepts of morpholog semantics, discourse of natural language	gy, &	Lecture	Grou	p Discussion		
CO 2	Demonstra relationshi statistics &	te understanding of p between NLP and c machine learning	the	Lecture	Quiz			
CO 3	Discover v features rei NLP task, morpholog tagging an	arious linguistic and statist levant to the basic namely, spelling correct fical analysis, partsof-spee d syntactic parsing	ical ion, ech	Video Lesso	ons Semi	nar		
CO 4	Demonstra analysis an	te the concept of semantic d word sense disambiguat	ion	Tutorial / Video Lesso	Semi	nar		
CO 5	Understand translation for NLP ap	d the components of mac process and develop the m oplications	chine nodel	Video Lesso	ons Assig	nment		
Offered	l by Data Sci	ience						
Course	Content		In	structional H	ours / Week :	1		
Unit		Description			Book	Chapters		
I	Introduction - Applications s and machine t machine learn Models - The Estimating pa models.	NLP tasks in syntax, sem uch as information extraction ranslation. The problem of ing. Brief history of the fi role of language models. Semanters and smoothing	nantics, a ion, ques f ambigu eld - N- Simple N g. Evalu	and pragmatic stion answering aity. The role of gram Languag I- gram model ating languag	s. g, of ge 1 s. ge			
Suggest	ed Learning N	Iethods: Tutorial		Instruc	tional Hours	12		

Π	Part synta algor basic	Of S ax. H rithms	peech T lidden 1 and EN	agging Marko 1 train	g and v Mo ing) -	Seque dels Basic	nce La (Forwa Neura	beling rd a l Netv	g - Lex nd Vit works. A	ical erbi Any	1		
	ousic	muo		opere	eption	und of	acaprop	ugun	Instru	ictiona	1 Hours		12
Suggest	ed Les	rning	Method	ls.Gra	un Di	izziraz	on		111511		1 110015		14
III	LST Gran	M Rennar	ecurrent formalis	Neur ms ai	al Ne nd tre	twork ebanks	s -Syn s. Effic Statistic	tactic cient	parsin parsing arsing	g - for and	1		
	prob reduc	abilist	ic CFGs endency	(PCFC parsin	Gs). Le g.	exicali	zed PC	FGs. 1	Neural s	hift-	I Uouna		10
Curanat	ad I ad	· · · · · · · · · · · · · · · · · · ·	× Matha		D		•		mstru	icuona	I Hours		12
Suggest		arning	g Mietnoc	is :Gr	$\frac{\text{oup } \mathbf{D}}{1}$	ISCUSS	lon	dia					
IV	Com Parsi Repr	positi ng - S esenta	semantics onal sem Syntactic ation.	s and antics. Parsin	semai g - Arg	rd - ntic Ro gumen	sense ole Labe t Identi	e dis elling a ficatio	ambigua and Sem on - Sem	antic antic antic	1		
I	Instructional Hours 12												
Suggest	Instructional Hours 12 sted Learning Methods :Video Presentation												
	Inform	nation	Extracti	on (II	E) - N	Jamed	entity	recog	nition a	and			
	relatio	n ex	traction.	IE u	sing s	sequen	ce lab	elling.	-Mach	ine			
V	Transl	ation	(MT) Bas	sic issu	les in N	AT. Sta	atistical	transl	ation, w	ord	1		
	alignn	nent. r	hrase-bas	sed trai	nslatio	n. and	svnchro	nous s	rammar	s.			
	0	71				,	5		Instri	ictiona	l Hours		12
									motre	Tota	l Hours	60	Hrs
			1 Iura	fsky F)an and	l Mart	in Iame	<u>к Н</u> '	Speech	and I a	nguage P	Processi	'ng''
Text Bo	ok		.3rd	Editio	n. 2013	8.	in sum		specen	und Eu	inguage i	100055	115
			1. Sow	/mva V	Vaiiala	. Bodh	isattwa	Maiu	mder. A	nui Gu	pta. Hars	shit	
Referen	ce Boo	oks	Sura	ana, 'Pr	actical	Natu	al Lang	guage	Process	ing", W	viley, 201	18.	
			2. Ber	nadette	e Sharr	o, Flor	ence Se	des, V	Vieslaw	Lubasz	zewski, "	Cogniti	ive
			App	roach	to Nat	ural L	anguag	e Proc	essing".	, CRC I	Press, 20	17.	
Web. U	RLs		https://v	www.t	utorial	spoint	.com/na	utural_	languag	ge_proc	essing/in	dex.htr	n
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	,						"hhue						
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO\PO CO1	PO1 H	PO2 H	РОЗ Н	PO4 M	РО5 Н	PO6 M	PO7 H	РО8 Н	PSO1 H	PSO2 H	PSO3 H	PSO4 M	PSO5 H
CO\PO CO1 CO2	PO1 H H	РО2 Н Н	РОЗ Н Н	PO4 M M	РО5 Н Н	PO6 M M	рринд РО7 Н Н	РО8 Н Н	PSO1 H H	PSO2 H H	PSO3 H H	PSO4 M M	PSO5 H H
CO\PO CO1 CO2 CO3	PO1 H H H	РО2 Н Н	РОЗ Н Н Н	PO4 M M M	PO5 H H H	PO6 M M M	РО7 Н Н Н	P08 H H H	PSO1 H H H	PSO2 H H H	PSO3 H H H	PSO4 M M M	PSO5 H H H
CO\PO CO1 CO2 CO3 CO4	PO1 H H H H H	PO2 H H H H	PO3 H H H H	PO4 M M M M	PO5 H H H H H H	PO6 M M M M	РО7 Н Н Н Н	P08 H H H H	PSO1 H H H H	PSO2 H H H H	PSO3 H H H H	PSO4 M M M M	PSO5 H H H H
CO\PO CO1 CO2 CO3 CO4 CO5	PO1 H H H H	PO2 H H H H	PO3 H H H H H	PO4 M M M M M	PO5 H H H H H H	PO6 M M M M M	РО7 Н Н Н Н Н	PO8 H H H H H H H	PSO1 H H H H H H H	PSO2 H H H H H H H	PSO3 H H H H H H H H H	PSO4 M M M M M	PSO5 H H H H H
CO\PO CO1 CO2 CO3 CO4 CO5 H-High;	PO1 H H H H H H H H H	PO2 H H H H H	PO3 H H H H ; L-Low	PO4 M M M M M	PO5 H H H H H H	PO6 M M M M M	РО7 Н Н Н Н	PO8 H H H H H	PSO1 H H H H H H	PSO2 H H H H H H	PSO3 H H H H H H H	PSO4 M M M M M	PSO5 H H H H H
CO\PO CO1 CO2 CO3 CO4 CO5 H-High;	P01 H H H H H M-Me	PO2 H H H H edium	PO3 H H H H ; L-Low	PO4 M M M M	PO5 H H H H H	PO6 M M M M M	P07 H H H H	PO8 H H H H H	PSO1 H H H H H H Ver	PSO2 H H H H H	PSO3 H H H H H V Chairm	PSO4 M M M M M	PSO5 H H H H H H

Cou	rse Code			Title				
23PC	GDTE308	Elective 3	Paper I	[I B: Time Ser	ies A	nalysis		
Semeste	er: III	Credits: 4	CIA:	25 Marks	E	SE:75 Marks		
Course	Objective	To equip students with foundations and practical this course, students will essential for interpreting	idents with a comprehensive understanding of the theor and practical applications of analyzing sequential data. The tudents will explore statistical methods, models, and techn interpreting and forecasting time-dependent data. Tship					
Course	Category	Entrepreneurship						
Develop	ment Needs	Global						
Course	Description	Learn to identify patterns gaining proficiency in mo will be placed on employ various fields such as fin sciences, enabling studen on historical time-based of	on, an on, an e real- ineeri cision	within time series data, nd validation. Emphasis -world problems across ing, and environmental ns and predictions based				
Course	Outcomes			Teaching Methods	I	Assessment Methods		
CO 1	Understand k series analys function esti impacts and r	key practical challenges in is and also forecasting, tra imation, assessing interve multivariate analysis.	1 time ansfer ention	Lecture		Group Discussion		
CO 2	Implement au definiteness, errors, and periodograma many more.	Itocorrelation properties, p estimation techniques, st spectral properties. Exp s, spectral density functio	ositive andard ploring ons and	Lecture		Quiz		
CO 3	Analyze L detailing th Autoregressi processes, stationarity.	inear Stationary Mod e General Linear Proc ve and Moving Aven and their conditions	lels, xess, rage for	Video Lesso	ns	Seminar		
CO 4	Acquire conc Processes, au spectrums. It Moving Aver and the duali Moving Aver	cept of Moving Average itocorrelation functions, an examines Mixed Autoregr rage Processes, their station ty between Autoregressive rage models.	Tutorial / Video Lesso	ns	Seminar			
CO 5	Create Linea general form shock, and processes of	 Ir Nonstationary Models, I, difference equation, ran integrated moving ave varying orders. 	their dom erage	Video Lesso	ns	Assignment		
Offered	by Data Sci	ience						

Course	Content Inst	ructional Hours /	Week :4	
Unit	Description		Text Book	Chapters
I	Introduction to Time Series: Five Important Pract - Forecasting Time Series - Estimation of Transfe Analysis of Effects of Unusual Intervention Event - Analysis of Multivariate Time Series - Dis Systems - Stochastic and Deterministic Dynamic Models: Stationary and Nonstationary Stochasti Forecasting and Control - Transfer Function Mod for Discrete Control Systems - Basic Ideas in Mod Parsimony - Iterative Stages in the Selection of a Models	ical Problems er Functions - ts to a System crete Control Mathematical ic Models for dels - Models odel Building: Model.	1	1
	· · · · · · · · · · · · · · · · · · ·	Instructional	Hours	12
Sugges	ted Learning Methods: Tutorial			
II	Autocorrelation Function and Spectrum of Station Autocorrelation Properties of Stationary Models and Stochastic Processes - Stationary Stochasti Positive Definiteness and the Autocovariand Autocovariance and Autocorrelation Functions - Autocovariance and Autocorrelation Functions - So of Autocorrelation Estimates - Spectral Properties Models: Periodogram of a Time Series - Analysis Spectrum and Spectral Density Function - Simple Autocorrelation and Spectral Density Functions and Disadvantages of the Autocorrelation and Spe Functions.	ary Processes: - Time Series c Processes - ce Matrix - Estimation of tandard Errors s of Stationary s of Variance - e Examples of - Advantages ectral Density	1	2
		Instructional	Hours	12
Sugges	ted Learning Methods: Group Discussion			
III	Linear Stationary Models - 1: General Linear H Equivalent Forms for the Linear Process - A Generating Function of a Linear Process - St Invertibility Conditions for a Linear Process - Autor Moving Average Processes - Autoregressive Stationarity Conditions for Autoregressive Autocorrelation Function and Spectrum of A Processes - The First-Order Autoregressive Proce Order Autoregressive Process - Partial Autocorrela- Estimation of the Partial Autocorrelation Funct Errors of Partial Autocorrelation Estimates.	Process - Two Autocovariance sationarity and pregressive and Processes - Processes - Autoregressive cess - Second- ation Function ion - Standard	1	3
		Instructional	Hours	12
Sugges	ted Learning Methods : Group Discussion			
IV	Linear Stationary Models - 2: Moving Average Invertibility Conditions for Moving Average Autocorrelation Function and Spectrum of Me Processes - First-Order Moving Average Process Moving Average Process - Duality Between Auto Moving Average Processes. Mixed Autoregre Average Processes - Stationarity and Invertibility Autocorrelation Function and Spectrum of Mixed	ge Processes - e Processes - oving Average - Second-Order oregressive and essive: Moving ity Properties - Processes.	1	3

										Instru	iction	al Hours	5	12
Suggeste	ed Lea	rning	g Method	ls :Vi	deo Pi	resent	ation	l						
V	Linea Movin Autor Proces Mode Differ of the Movin Proces of Orc of Orc d, q)	ur No egresss sss Exh l - T rence l e Moo ng Av ss of (der (0, der (0,	onstation verage ive Proc ibiting H Three Ex Equation del - In verage P Order (0, 2, 2) - G	ary M Proce ess - lomog plicit Form verted rocess 1, 1) - eneral	Aodels sses - Genera eneity Form of the Form es - Integr Integr	: Au - No al Mo - Gene s for Mode of t Integr rated M ated M	toreg nstati del fe eral F the l - Ra he M rated Movin Movin	ressiv on a for a Corm of ARI andor Iodel Mov ng Av ng Av	ve Nor of th MA n Sh ving vera	Integra First-Orn the ARIM Mode nock Fo Integra ge Proc ge Proc	ted der ary AA 1 - orm ted age ess ess	1		4
										Instru	iction	al Hours	5	12
											Tot	al Hours	6) Hrs
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Referen	ce Boo	oks	1. J. J. and 2. Jam 201	F. Co Contro es D. 1 2.	mmano ol", Wi Hamilt	deur, S ley, 20 con, "T	S.J. K 007. Time S	Serie	nan, s Ar	"Time nalysis"	Series	Analysis	s: Foreca	asting Press,
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				To	ols for	Asse	ssme	nt (2	5 M	arks)				
CIA	I	С	IA II	C	IA III	Α	ssigni	ment		Semina	ır	Quiz	Т	otal
5			5		6			3		3		3		25
						M	appir	ng						
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	7 P	80	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	Н	М	Н	М	Н		H	Н	Н	Н	М	Н
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		Cour	se desigi	ied by	7					Ver	ified b	y Chairı	nan	
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23P0	GDTE309	Elective P	aper	III C: Healthc	are Analytic	5								
Semest	er: III	Credits: 4	CIA:	25 Marks	ESE:75 M	arks								
Course	Objective	To explore Healthcare An techniques, and applicatio	nalyti ons in	ics, encompassi the healthcare i	ng data colle ndustry.	ction, analysis								
Course	Category	Employability			•									
Develop	oment Needs	Global												
Course	Description	This course delves into H analysis, and application learn to harness data-driv healthcare operations, and	Iealth of d ven i l mak	acare Analytics, ata in the healt nsights to enha ace informed deci	focusing on hcare sector. nce patient sions.	the collection, Students will care, optimize								
Course	Outcomes			Teaching Methods	Assessme	nt Methods								
CO 1	Understand EHR, Cod Phenotypin	stand Healthcare Data Analytics, Coding, Benefits, Barriers, and Lecture Group Discuss												
CO 2	CO 2 Implement knowledge on Biomedical Image, Sensor Data Mining, Signal Analysis, Genomic Data for Personalized Medicine.													
CO 3	Analyze N Text, B Analytics.	ILP, Data Mining in Clinica iomedical Social Media	al a	Video Lesson	s Semir	nar								
CO 4	Acquire kr Data Analy Temporal I Methods.	nowledge on Advanced Health ytics, Prediction Models, Mining, Visual Analytics, Priv	ncare vacy	Tutorial / Video Lesson	s Semir	nar								
CO 5	Create H Detection Decision Mobile A	ealthcare Applications, Frau , Pharmaceutical Discoveries Support, Image Analysis nalytics.	ıd s, s,	Video Lesson	s Assig	nment								
Offered	l by Data Sci	ience												
Course	Content		In	structional Hou	irs / Week :	4								
Unit		Description			Text Book	Chapters								
I	I Introduction: Introduction to Healthcare Data Analytics- Electronic Health Records-Components of EHR- Coding Systems- Benefits of EHR- Barrier to Adopting EHR- Challenges- Phenotyping Algorithms													
~	Instructional Hours 12													
Suggest	Suggested Learning Methods: Tutorial													
II	Analysis: Bio in Healthcar Analysis for	omedical Image Analysis- Mi e- Biomedical Signal Analy Personalized Medicine.	ining ysis-	of Sensor Data Genomic Data	1	4,5								
				Instructi	onal Hours	12								

Suggest	ed Lea	rning	g Metho	ds: Gr	oup D	iscussi	ion						
III	Anal Clini	ytics: cal To	Natural ext- Min	Languing the	age Pa e Bion	rocessi nedical	ng and Social	Data Medi	Mining a Analy	for tics	1		7,8
	for H	lealth	care.										
<u>C</u>	. 1 T	•	N. 41		T	•			Instru	ictiona	l Hours		12
Suggest		irning	g Metho	$\frac{\mathrm{d}\mathbf{s}:\mathbf{G}}{\mathrm{A}}$	roup L	NSCUSS	sion			f			
IV	Heal Data Heal Geno Prese	thcare Min thcare omic	Data – Revie ing for - Predic Data- In Data Pu	W of (Heal tive 1 format	Clinica thcare Models ion Re ng Met	I Pred Data s for etrieva hods in	liction - Visu Integra I for H n Healt	Model al A ting (lealthc hcare.	s- Tem nalytics Clinical are- Pri	poral for and ivacy	1	11	,13,14
Instructional Hours 12											12		
Suggest	Suggested Learning Methods :Video Presentation												
V	VApplications: Applications and Practical Systems for Healthcare- Data Analytics for Pervasive Health Fraud Detection in Healthcare- Data Analytics for Pharmaceutical Discoveries- Clinical Decision Support Systems- Computer- Assisted Medical Image Analysis Systems- Mobile Imaging and Analytics for Piane discl Data115,16,17											,16,17	
	j								Instri	ictiona	Hours		12
										Tota	Hours	60	Hrs.
Text Bo	ok		1. Cha ana	andan l lytics"	K. Red ,Taylo	dy and r & Fr	l Charu ancis, 2	C Agg 019.	garwal,	"Health	icare data	a	
Doforon	Reference Books 1. Hui Yang and Eva K. Lee, "Healthcare Analytics: From Data to Knowledg to Healthcare Improvement, Wiley, 2016. 2. Trevor L. Strome, "Healthcare Analytics for Quality and Performance											nowledge	
Keleren			2. Tre Imp	vor L.	Strom	e, "He Wiley,	althcare 2015.	Anal	ytics for	Qualit	y and Per	riorma	nce
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Course Code		Title	
23PGDTCP301		Internship	
Semester: III	Credits: 2	CIA: 50 Marks	ESE: -

Objective:

To give optimum exposure on the practical side of industrial society

Guidelines:

- Duration of the internship training is 20 Days during the summer vacation which falls at the end of the 3rd Semester.
- 4. The departments concerned will prepare on exhaustive panel of institutions, industries and practitioners.
- 5. The individual student has to identify the institution / industry / practitioners of their choice and inform the same to the HOD / staff-in-charge.
- 6. The student's hereafter will be called as trainees should maintain a work diary in which the daily work done should be entered and the same should be attested by the section in-charge.
- 7. The departments should prepare an outline of the job to be done, sections in which they have to be attached both in the office as well as in the field.
- 8. The trainees should strictly adhere to the rules and regulations and office timings of the institutions to which they are attached.
- 9. The trainees have to obtain a certificate on successful completion of the internship from the chief executive of the organization.
- 10. Monitoring and inspection by staff on a regular basis.
- 11. Report writing manual and format should be prepared by the respective departments.
- 12. All model forms are to be attached wherever it is necessary.
- 13. Report Evaluation: Internal viva-voce examination will be conducted and the maximum mark awarded is 50.
- 14. In-Plant Training has to be carried out only in the approved industries by the department/College
- 15. Report should be submitted in the 4thsemester.

Cou	Course Code Title									
23P0	GDTC411		Paper	r XI: IoT Analy	tics					
Semest	er: IV	Credits: 4	CIA	: 25 Marks	ESE: 75 N	Iarks				
Course	Objective	Comprehend the found encompassing data c techniques within clou	dational ollection d and ec	principles and c n, platforms, ar lge-based enviro	hallenges of chitectures, nments.	IoT analytics, and analytics				
Course	Category	Employability								
Develop	oment Needs	Global								
Course	Description	Knowledge on IoT ana challenges in smart cit solutions while evaluat analytics.	Knowledge on IoT analytics tools and methodologies to address real-wor challenges in smart city contexts, integrating cloud-based and edge-bas solutions while evaluating the implications of data processing and mobil analytics.							
Course	Outcomes	Assessme	nt Methods							
CO 1	Understand Io	IoT analytics fundamentals Lecture Group Discussion								
CO 2	Implement bas WAZIUP soft	sic IoT deployment and make ware platform	e use of	Lecture	Quiz					
CO 3	Analyze sense search engines	or metadata streams and us	sage of	Video Lessons	Semir	ar				
CO 4	Acquire know analytics appl	ledge on development tools fications	for IoT	Tutorial / Video Lessons	Semir	nar				
CO 5	Create and structure cities and near	udy on IoT analytics for structure by environments	Video Lessons	Assig	nment					
Offered	l by Data Sci	ence								
Course	Content		In	structional Hou	rs / Week :5					
Unit		Description			Text Book	Chapters				
I	Introducing Ic of IoT Analy Techniques - Paradigms - R Functional Ar Collection Us	oT Analytics: IoT Data and tics Applications - IoT A Cloud-based IoT Platform equirements of IoT Big Da rchitecture - Data Analyt ing Low-power, Long-rang	d Big Da Analytics 1 - IaaS, ata Anal ics for ge Radio	ata - Challenges s Lifecycle and PaaS and SaaS ytics Platform - the IoT - Data os.	1	1,2,3				
				Instructio	onal Hours	15				
Suggest	ed Learning N	Aethods: Tutorial	11	D. G. G. J						
п	 WAZIUP Software Platform - Main Challenges - PaaS for IoT Architecture - Deployment - iKaaS Software Platform - Service Orchestration and Resources Provisioning - Advanced Data Processing and Analytics - Service Composition and Decomposition - Migration and Portability in Multi-cloud - Cost Function of Service Migration 									
	Instructional Hours 15									
Suggest	ed Learning Methods: Group Discussion									
III	Searching the Social and Pl enviRonment Building an Id	Internet of Things - A nysical Sensors - Search generated contenT (SM of Search Engine - Local	Search engine ART) - Event R	Architecture for for MultimediA Challenges in etrieval - Social	1	6,7				

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NASC 2023

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	Local	Event	ts in the	City.					•				
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Suggest	ed Lea	rning	g Methoo	ds : Gi	coup D	iscussi	ion			T . 1			
IV	Devel VITA Devel Query system – Filte	opmen LArch opmen senso ns nod ering r	nt Tools nitecture nt Envir ors – Que les – Diso nodes – T	s for for I onmen ery obs cover s Chresho	oT An oT An t –Que ervatio ervices old not	Analyti alytics ery sys ns – Di s nodes les – R	cs Ap Appli tems – scover – Disc esampl	plicat cation Quer y node over s e node	ions – VIT is – VIT y service es – Disco ensors no es	The AL es – over des	1	8	,9
I		0					- 1		Instruc	ctional	Hours	1	5
Suggest	sted Learning Methods :Video Presentation												
V	Internet-of-Things Analytics for Smart Cities - State of the Art- Cloud-based City Platform - Use Case of Cloud-based DataAnalytics - New Challenges towards Edge-based Solutions -Edge-based IoT Analytics - State of the Art - Edge-based City1Platform - Workflow - Task and Topology - IoT-friendlyInterfaces - Use Case of Edge-based Data Analytics - Overviewof Crowd Mobility Analytics												,11
•									Instruc	ctional	Hours	1	5
										Total	Hours	75]	Hrs
Text Bo	ok		1. John	n Solda	atos, "l	Buildin	g Blocl	ks for	IoT Anal	ytics", I	River Pu	blishers	s, 2017.
Referen	ce Boo	oks	1. Joh Wil 2. Pras "Io" https://d	n Stray ey, 20 sant Ku <u>F and A</u> docs.ay	v, "IoT 17. umar P <u>Analyti</u> ws.ama	` Analy attnaik ics", Cl zon.co	rtics: A , Ragh ^v <u>RC Pre</u> m/iotar	Guide vendra ss, 20 nalytic	e for IT a a Kumar, 18. cs/latest/u	nd Busi S. N. Pa serguid	ness Pro anda, So e/getting	ofession ouvik Pa g-started	als", ıl, <u>l.html</u>
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	-			10	ols for	Asses	sment	(25 IVI	arks)				
CIA	1	C		C.	IA III	As	signme	nt	Seminar	(Luiz	To	tal
5)		5		6	•	3		3		3		25
	DO1	DOD	DO1	DO 4	DO 5		pping	DOB	DCO1	DECO	DE02	DSO4	DEO.
	РОГ	Р02 Н	<u>РОЗ</u> Н	P04 M	Р05 Н	P06 M	Р0/ Н	Р08 Н	PSOI H	Р502 Н	Р503 Н	PS04 M	Р505 Н
CO2	н	н	H	M	H	M	Н	н	H	Н	Н	M	н
CO3	H	Н	Н	М	Н	M	н	Н	Н	Н	Н	M	н
CO4	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO5	H	H	H	M	H	M	Н	Н	Н	Н	Н	M	H
H-High;	M-Me	dium	; L-Low				<u> </u>	1		<u> </u>	1		
Course designed by Verified by Chairma											an		
		Dr. I	B. Narasi	mhan					D	r. N. Ka	avitha		

NASC 2023

Cours	se Code			Title			
23PGI	DTV401		Project W	ork and Viva-Voce			
Seme	ster: IV	Credits: 8	CIA	: 80 Marks	ESE: 120 Marks		
Course	Objective	To give project- practically what	-based learnir t they learned	ng which makes the s	tudents to apply		
Course	Category	Skill Developm	nent				
Develop	ment Needs	Global					
Course l	Description	Develop Proble at Global needs	em Solving S	kills to solve the con	nputer based problems		
Course	Outcomes			Teaching Methods	Assessment Methods		
CO 1	Remen algorith	ber the fundamental m and designs	concepts of	Lecture	Group Discussion		
CO 2	Unders Softwa applied	tand the optimal meth re Engineering conce	hods and epts to be	Tutorial	Quiz		
CO 3	Apply t learned	he knowledge and w	hat they	Video Lessons	Seminar		
CO 4	Analyz feasibil	e the Economical and ity	d Technical	Tutorial / Video Lessons	Seminar		
CO 5	Develo applica	ping a software-based tions and deployment	d t of software	Video Lessons	Assignment		
Offered	by Comp	uter Science(Data S	cience)				
Course	Content		Instructional Hours / Week : 25				
		PR	ROJECT WO	RK			
	A project	report submitted to t	Title of the P he Bharathian	roject University in the pa	rtial fulfillment		
	1 5	of the requirem	ents for the a	ward of the degree of			
		MASTER OF	SCIENCE IN	N DATA SCIENCE			
		Sul	bmitted by				
		Ν	Name of the S	tudent			
			(Reg.No	.)			
		Un	der the Guida	ince of			
		Guio	de Name (Des	signation)			
			<college emb<="" td=""><td>olem></td><td></td></college>	olem>			
		NEHRU AR'	TS AND SCI	ENCE COLLEGE			
			(Autonomo	ous)			
(R	eaccredited	by NAAC with "A ⁺ "	Grade, ISO 9	001-2008 & ISO 140	001 : 2004 Certified)		
	RECOGN	IIZED BY UGC & A	FFILIATED	TO BHARATHIAR	UNIVERSITY		

"NEHRU GARDENS", T. M. PALAYAM, COIMBATORE -	641 105.
Month & year	
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ACKNOW LEDGEMEN I	11
DECLERATION CEDTIFICATE FROM THE COMPANY/OR CANIZATION	111
CERTIFICATE FROM THE COMPANY/ORGANIZATION	1V
BUNAFIDE CERTIFICATE	V
SYNOPSIS (abstract of the project)	V1
2. INTRODUCTION	1
2.1. About the project	
2.2. Organization profile	
3. SYSTEM ANALYSIS	
3.1. Existing system	
3.2. Proposed system	
3.2.1. System Study	
3.3. System specification	
3.3.1. Hardware specification	
3.3.2. Software specification	
3.3.3. About the software	
4. SYSTEM DESIGN	
3.1 Design Notations	
3.1.1 Data flow diagram	
3.1.2 System flow diagram	
3.1.3 ER Diagram	
3.2 Design Process	
3.2.1 Input design	
3.2.2 Database design	
5. EXETENT TESTING AND IMPLEMENTATION	
5. SYSTEM TESTING AND IMPLEMENTATION	
5.1. Testing methodologies	
4.2 System implementation	
6. CONCLUSION & FUTURE ENHANCEMENTS	
Bibliography	
Appendix	
A. Sample Screens	
B. Reports	

NASC 2023

	Tools for Assessment (30 Marks)													
Review I R		Rev	iew II	Review III		Document, Preparation and Implementati on		Research Paper Publication in Journals			Total			
15 15				15			20			15		80)	
Ma						appir	ng							
CO \ PO	PO1	PO2	PO3	PO4	PO5	РО	6 P	07	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Η	Н	М	Η	Μ	I	Η	Н	Η	М	Н	Η	Н
CO2	Н	Н	Н	М	Η	M	I	H	Н	Η	Μ	Н	Η	Н
CO3	Н	Н	Η	М	Η	Μ	I	H	Н	Η	Μ	Н	Η	Н
CO4	Н	Η	Η	Μ	Η	Μ	I	Η	Н	Η	Μ	Н	Η	Η
CO5	Н	Η	Η	Μ	Η	Μ	I	Η	Н	Η	Μ	Н	Η	Η
H-High; M-Medium; L-Low														
	Course designed by									Veri	fied by	Chair	man	
		Dr. B.	Narasi	imhan						Ι	Dr. N. K	Lavitha		

Cour	se Code			Title				
23PG	DSSS01	Advanc	ed Lea Clou	rners Course: Id Computing	Pape	er – I		
Seme II / II	ster: [/ IV	Credits: 2		CIA: -		ESE: 100 Marks		
Course	Objective	To enable the students to u IaaS, PaaS, SaaS and its re	To enable the students to understand the concepts of cloud computing, IaaS, PaaS, SaaS and its recent advancements					
Course	Outcomes			Teaching Methods		Assessment Methods		
CO 1	Explain the computing	underlying concept of cloud		Lecture / Vie Lectures	deo	Assignment		
CO 2	Analyze ela advantages various clo	astic computing with its and understand the concept of ud services	of	Lectures / Vi Lessons	Seminar			
CO 3	Determine providers	various types of clouds and cl	loud	Lectures / Vi Lessons	deo	Quiz		
CO 4	Understand infrastructu	I the concept of data center, are and equipment		Tutorial / Lecture	/	Seminar		
CO 5	Analyze the virtualizati	e various approaches of on		Lecture / Vie Lectures	deo	Quiz		
Offered	by Data S	Science						
Course (Content							

Unit		Description	Text Book	Chapters				
Ι	Motivations for for Flexible C Cores to Mult Load Balancir	or Cloud: Cloud Computing Everywhere - A Facility Computing - The Start of Cloud - From Multiple iple Machines - From to Clusters to Web Sites and ag - Racks of Server Computers.	1	1				
II	Elastic Computing and its Advantages: Introduction - Multi- Tenant Clouds - The Concept of Elastic Computing - Using1Virtualized Servers for Rapid Change - IaaS - PaaS - SaaS.1							
III	Types of Clou Private Cloud The Advantag	1	3					
IV	Data Center Pods - Pod Si Capacity and Storage in a D	Infrastructure and Equipment: Racks, Aisles, and ze - Exhaust Ducts - Lights-out Data Centers - High Link Aggregation - External Internet Connections - ata Center.	1	4				
V	Virtual Mach Full Virtualiza VM Migratior	ines: Approaches to Virtualization - Properties of ation - Virtual I/O Devices - Virtual Device Details - a - Running Virtual Machines in an Application.	1	5				
Text B	ook	1. Douglas Comer, "The Cloud Computing Book", G	CRC Press	, 2021.				
Refere	nce Books	 Arshdeep Bahga, Vijay Madisetti, "Cloud Comput Approach", Wiley, 2014. Thomas Erl, Ricardo Puttini, Zaigham Mahmood, Concepts, Technology & Architecture", CRC Press 	ting - A Ha "Cloud Co ss, 2018.	ands-on omputing:				
Web. U	J RLs	https://www.simplilearn.com/tutorials/cloud-comput	ing-tutoria	<u>ll</u>				

						Maj	pping						
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	Н	Н	Н	Μ	Н	Μ	Н	Н	Н	Н	Н	М	Н
CO2	Н	Н	Н	М	Н	Μ	Н	Н	Н	Н	Н	М	Н
CO3	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO4	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO5	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
H-High;	M-Med	lium; L	L-Low										
	(Course	e desig	ned by	y				Veri	fied by (C <mark>hairm</mark>	an	
		Dr.	N. Kav	vitha					Ι	Dr. N. K	avitha		

Cour	Course Code Title									
23PG	GDSSS02	Advanced Data	l Learners Course: Pa Analysis using MS-E	per – II kcel						
Seme II / II	ester: I / IV	Credits: 2	CIA: -	ESE:	100 Marks					
Course	Objective	To learn data analysis using	MS - Excel							
Course	Outcomes	-	Teaching Method	s Assessn	nent Methods					
CO 1	Understand and workin	the concept of VBA Macros g with the environment	Lecture / Video Lectures	As	signment					
CO 2	Develop wi saving data	indow registry, loading data an i in MS Excel	d Lectures / Video Lessons	S	Seminar					
CO 3	Evaluate nu Excel	imerical calculations using MS		Quiz						
CO 4	Design MS tasks	e S	Seminar							
CO 5	Demonstrat including E		Quiz							
Offered	by Data S	beience								
Course	Content									
Unit		Description		Text Book	Chapters					
I	Accessing D Worksheet - Sorting Data within a W Duplicates	ata in Excel: A VBA Macro V Ranges in Worksheets - Using a - Sorting Data by Absolute V orksheet - Deleting Rows at	Vriter's Perspective: Th g Explicit Referencing Value - Sorting a Rang nd Columns - Findin	e - e 1	2					
II	Methods of 2 a Worksheer Writing Log - Determinin	Loading and Saving Data in E t - Importing Worksheet from Files - Using the Windows R og Files within a Chosen Folder	Excel: Importing Data t n Another Workbook egistry to Save Setting	2 - s 1	3					
III	Utilizing F Functions ir Formulas - Creating a L	unctions in Excel: Creating Code - Handling Errors in Using Macro Recorder to inear Regression Tool - Corre	g and Utilizing VBA VBA Functions - Arra Capture Processes lation Vs Causation	A 9 1	5					
IV	Data Mining Refedit Com Fonts and B Windowing	g in Excel: Form Reuse in VB trol from a Textbox - Highligh ackgrounds - Creating a Color Tool - Linear and Non-linear M	A Projects - Creating hting and Coloring Cell Font Tool - Creating Mapping	a 1 a 1	6					
V	Creating Cu Creating Cu Executing C Techniques	n - 1	7							
Text Bo	Book 1. Brian Bissett, "Automated Data Analysis Using Excel", CR 2020.									
Referen	ce Books	 Kenneth N. Berk, Patric Excel",2010. John Walkenbach, "Exc 	k Carey, "Data Analys el 2016 Bible", Wiley,	is with Micr 2015.	rosoft					

Web. UR	RLs	https://v	www.w	v3scho	ols.cor	n/EXC	EL/ind	ex.php					
Mapping													
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO2	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO3	Η	Η	Н	Μ	Н	Μ	Н	Н	Н	Н	Н	М	Н
CO4	Η	Η	Н	М	Н	Μ	Н	Н	Н	Н	Н	М	Н
CO5	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
H-High; l	H-High; M-Medium; L-Low												
	Course designed by									fied by (C <mark>hairm</mark>	an	
		Dr.	N. Kav	vitha				Dr. N. Kavitha					

Cou	rse Code	Title									
23PC	GDSSS03	Advanced L Opti	earners Course: F mization Techniqu	ape: ues	r – III						
Seme II / Il	ester: II / IV	Credits: 2	CIA: -		ESE:	100 Marks					
Course	Objective	To learn data analysis using N	AS - Excel								
Course	Outcomes		Teaching Metho	ods	Assessment Methods						
CO 1	Understand programmi	I the concepts of linear ing and several methods	Lecture / Vide Lectures	90	Assignment						
CO 2	Solve singl optimizatio	e variable non-linear on problems	Lectures / Vid Lessons	eo	S	eminar					
CO 3	Design Mu Nonlinear	eo		Quiz							
CO 4	Illustrate va optimizatio	ure	S	eminar							
CO 5	Demonstration	90		Quiz							
Offered	l by Data S	Science									
Course Content											
Unit			Text Book	Chapters							
Ι	Linear Prog Method - S Duality Prin	cal s -	1	2							
II	Single Vari Exhaustive Halving Met	able Nonlinear Optimization: Search Method - Bounding Pha thod - Fibonacci Search Method	Classical Method se Method - Inter - Bisection Method	l - val	1	3					
III	Multivariab Unidirection Simplex Sea Descent Me	le Unconstrained Nonlir nal Search Method - Evolution arch Method - Conjugate Direct thod - Newton's Method	ear Optimizati ary Search Metho on Method - Steep	on: d - best	1	4					
IV	Multiobjecti Function Me Function Me	ve Optimization: Global Criter ethod - Inverted Utility Method ethod - Lexicographic Model	ian Method - Uti - Bounded Object	lity ive	1	9					
v	Nature Insp Network bas Swarm Opti	pired Optimization: Genetic sed Optimization - Ant Colony C mization	Algorithm - Neu Optimization - Parti	ıral cle	1	10					
Text Bo	ook	1. Sukanta Nayak, "Fundam withAlgorithms", Elsevie	entals of Optimizat Science, 2020.	ion 🛛	Fechnique	S					
Referer	ice Books	1. Chander Mohan, Kusum Deep, "Optimization Techniques", CRC Press, 2009.									
		2. Godfrey C. Onwubolu, B. Engineering", Wiley, 201	V. Babu, "New Oj 0.	ptim	ization Te	chniques in					
Web. U	RLs	https://deeplearning.neuromatch.io/tutorials/W1D5_Optimization/student/ W1D5_Tutorial1.html									

	Mapping												
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	Н	Н	Н	Μ	Н	М	Н	Н	Н	Н	Н	М	Н
CO2	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO3	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO4	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO5	Н	Н	Н	Μ	Н	М	Н	Н	Н	Н	Н	М	Н
H-High;	M-Med	lium; L	L-Low										
Course designed by								Verified by Chairman					
		Dr. B.	Naras	imhan				Dr. N. Kavitha					

Cour	rse Code		Title									
23PC	DSSS04	Advanced L Dist	earners Course: I tributed Computin	Pape ng	r – IV							
Seme II / II	ester: I / IV	Credits: 2	CIA: -		ESE:	100 Marks						
Course	Objective	To learn data analysis using N	AS - Excel									
Course	Outcomes		Teaching Metho	ods	Assessment Methods							
CO 1	Understand organizatio	the basics of computer ons and standards	Lecture / Vide Lectures	eo	Ass	ignment						
CO 2	Demonstra distributed	te formal approaches to systems design	Lectures / Vid Lessons	eo	S	eminar						
CO 3	Illustrate m algorithms	utual exclusion and election	Lectures / Vid Lessons	eo		Quiz						
CO 4	Design the detection a	mechanisms for prevention, nd avoidance of deadlocks	Tutorial / Lect	ure	S	eminar						
CO 5	Solve relial computing	bility issues in distributed environment	Lecture / Vide Lectures	eo		Quiz						
Offered	by Data S	Science										
Course	Content											
Unit		Description		Text Book	Chapters							
Ι	Introduction: Basic Computer Organizations - Definition of a Distributed System - Interconnection Networks - Applications and1Standards - Scope1											
П	Formal App to Models - Clocks – Ap	roaches to Distributed Systems Casually Related Events - Gl plications.	Design: Introduct obal States - Logi	ion ical	1	3						
III	Mutual Exc Non token Bidding - Se	clusion and Election Algorithms based Solutions - Token based elf stabilization.	: Mutual Exclusio Solutions - Electio	n - n -	1	4						
IV	Prevention, Problem - D Detection ar	Avoidance and Detection of Development eadlock Prevention - Deadlock And Recovery - Examples	adlock: The Deadlo Avoidance - Deadlo	ock ock	1	5						
V	Reliability i Blocks of Fa Faults - Iss Faults	n Distributed Systems: Basic M ault Tolerant System Design - H ues in Backward Recovery - H	lodels - Building andling of Node andling of Byzant	ine	1	8						
Text Bo	ook	1. Jie Wu, "Distributed Syst	em Design", CRC l	Press	, 2017.							
Referen	ice Books	 Ajay D. Kshemkalyani, Mukesh Singhal, "Distributed Computing Principles, Algorithms, and Systems", Cambridge University Press, 2011. Gabriele Kotsis, Péter Kacsuk, "Distributed and Parallel Systems: From Instruction Parallelism to Cluster Computing", Springer US, 2012. 										
Web. U	RLs	https://www.geeksforgeeks.or	rg/distributed-syste	ms-t	utorial/							

Mapping													
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	Н	Н	Н	Μ	Н	Μ	Н	Н	Н	Н	Н	М	Н
CO2	Н	Н	Н	М	Н	Μ	Н	Н	Н	Н	Н	М	Н
CO3	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO4	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO5	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
H-High;	M-Med	lium; L	L-Low										
Course designed by								Verified by Chairman					
		Dr. B.	Naras	imhan				Dr. N. Kavitha					

Cou	rse Code		Tit	tle							
23PC	GDSSS05	Advance	d Learne Data	rs Course: Mining	Pape	$\mathbf{r} - \mathbf{V}$					
Seme II / II	ester: I / IV	Credits: 2	CI	A: -		ESE:	100 Marks				
Course	Objective	To learn data analysis usin	g MS - Ex	kcel							
Course	Outcomes		Teaching Methods								
CO 1	Understand and predict	l data mining, its applications ive modelling	L	ecture / Vid Lectures	eo	Assignment					
CO 2	Demonstration and data cl	te data preprocessing methods eaning	s Le	Lectures / Video Lessons			eminar				
CO 3	Illustrate va and its type	arious classification technique es	s Le	ectures / Vid Lessons	leo		Quiz				
CO 4	Demonstration metrics	te cluster analysis with distand	ce Tu	torial / Lect	ure	Se	eminar				
CO 5	Illustrate va association	arious factors to evaluate mining	L	ecture / Vid Lectures	eo		Quiz				
Offered	Offered by Data Science										
Course	Content										
Unit			Text Book	Chapters							
I	Data Mining Data Mini Segmentatio	y: Need for Data Mining - Da ng Process: Predictive M n - Link Analysis - Deviation	ta Mining Modelling Detection	Application - Datab	ns - Dase	1	2				
II	Data Prepr Preprocessir Transformat	ocessing: Need for Data og Methods - Data Cleaning ion - Data Reduction.	Preproce Data Inte	essing - D egration - D	Data Data	1	4				
III	Classification Classification - Working co	on: Introduction - Types of C on - Priori Classification - Inp of Classification.	Classificati out and Ou	ons: Poster tput Attribu	iori ites	1	5				
IV	Cluster Anal Cluster Ana Metrics.	ysis: Introduction of Cluster A alysis - Desired Features of	Analysis - A	Application ng - Dista	s of nce	1	7				
V	Association Mining - T Rules - The	Mining: Introduction - Def he Metrics to Evaluate the Native Algorithm for Finding	ining Ass Strength Associati	ociation Ru of Associat on Rules.	ule ion	1	9				
Text Bo	ook	1. Parteek Bhatia, "Data I andPractical Technique	Mining and es", Camb	d Data Ware ridge Unive	ehous rsity	sing - Prin Press, 20	ciples 19.				
Referen	ice Books	 Mohammed J. Zaki, W Fundamental Concepts Press,2014. N. P. Gopalan, "Data M N. P. Gopalan, "Data M 	 Mohammed J. Zaki, Wagner Meira, "Data Mining a Fundamental Concepts and Algorithms", Cambridg Press,2014. N. P. Gopalan, "Data Mining: Techniques and Tren 								
Web. U	RLs	Hall of India Pvt. Limi	ted, 2015. n/data-mi	ning							

	Mapping												
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	Н	Н	Н	М	Н	М	Н	Н	Н	Н	Н	М	Н
CO2	Н	Н	Н	Μ	Н	Μ	Н	Н	Н	Н	Н	М	Н
CO3	Н	Н	Н	Μ	Н	Μ	Н	Н	Н	Н	Н	М	Н
CO4	Н	Н	Н	Μ	Н	Μ	Н	Н	Н	Н	Н	М	Η
CO5	Н	Н	Н	Μ	Н	М	Н	Н	Н	Н	Н	М	Н
H-High;	M-Med	lium; L	L-Low										
	(Course	e desig	ned by	7				Veri	fied by (Chairm	an	
		Dr.	N. Kav	vitha				Dr. N. Kavitha					

n mm g1g12023 Dr. n havinm

BoS - Chairman Department of Computer Science Nehru Arts and Science College (Autonomous) Coimbatore - 641 105.

