COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: MATHEMATICS FOR DATA SCIENCE

COURSE CODE: MDS20103

CREDITS: 4

DEPARTMENT: M.Sc. DATA SCIENCE

PROGRAMME OUTCOMES Or POS(MDS):

PROGRAM OBJECTIVES (POs)

PO1: Engage in continuous reflective leaning in the context of technology and scientific advancement.

PO2: Identify the need and scope of the Inter disciplinary area.

PO3: Understand the professional, ethical, and social responsibilities.

PO4: Enhance disciplinary competency, employability, and technical skills.

PROGRAMME SPECIFIC OUTCOME:

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Abstract Thinking: Ability to understand the abstract concepts that lead to various data science theories in Mathematics, Statistics and Computer science.

PSO2: Problem Analysis and Design Ability: To identify analyse and design solutions for data science problems using fundamental principles of mathematics, Statistics, computing data sciences, and relevant domain disciplines.

PSO3: Modern software tool usage: Acquire the skills in handling data science programming tools towards problem solving and solution analysis for domain specific problems.

PSO4: Societal and Environmental Concern: Utilize the data science theories for societal and environmental concerns.

PSO5: Professional Ethics: Understand and commit to professional ethics and cyber regulation

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Design a data base for a system using E-R data model and Relational Data model.	VI (CREATE)
CO2	**CO2:** Design logical database with all integrity constraints over relations.	VI (CREATE)
CO3	**CO3:** Apply normalization steps in database design and removal of data anomalies.	III (APPLY)
CO4	**CO4:** Extend the characteristics of database transactions	II (UNDERSTAND)
CO5	**CO5:** Distinguish the different types ofNoSQL databases	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

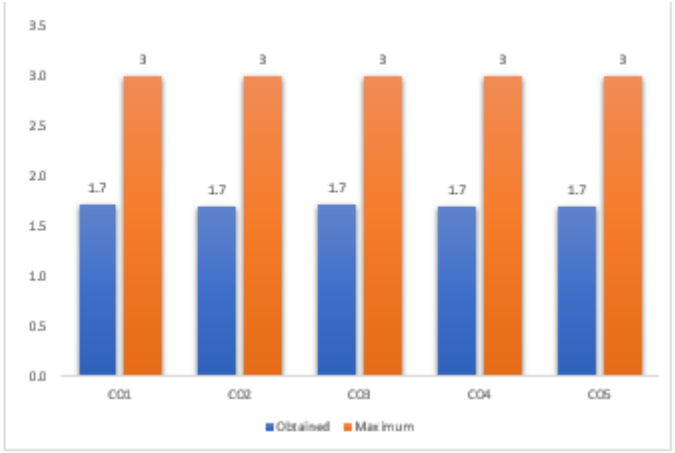
Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1	H	H	S	S					H	H	H	H	S
2	S	S	S	H					S	H	H	S	H
3	S	S	H	S					S	H	H	S	H
4	H	S	H	H					S	S	H	H	H
5	H	H	H	S					H	S	S	H	S

H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	co wise internal	pass %	Attainment level	co wise external average	co wise total
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	77.8	2.0	2.8	75.0	1.0	1.0	1.7
CO2	100.0	3.0			100.0	3.0			100.0	3.0	77.8	2.0	2.8	75.0	1.0	1.0	1.7
CO3	100.0	3.0	91.7	3.0	100.0	3.0			100.0	3.0	77.8	2.0	2.8	75.0	1.0	1.0	1.7
CO4			91.7	3.0	100.0	3.0			100.0	3.0	77.8	2.0	2.8	75.0	1.0	1.0	1.7
CO5			91.7	3.0	100.0	3.0			100.0	3.0	77.8	2.0	2.8	75.0	1.0	1.0	1.7

AVERAGE	AVERAGE
1	1.708

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1		PO2		PO3		PO4	
CO1	H	1.72	H	1.72				
CO2							H	1.7
CO3					H	1.72		
CO4	H	1.7			H	1.7	H	1.7
CO5	H	1.7	H	1.7	H	1.7		
AVERAGE OF COS FOR POS	1.706666667		1.71		1.706666667		1.7	
AVERAGE OF POS	1.7022		1.705		1.7066667		1.7	
AVERAGE	1.703472222							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: STATISTICS AND PROBABILITY

COURSE CODE: MDS20105

CREDITS: 4

DEPARTMENT: M.Sc. DATA SCIENCE

PROGRAMME OUTCOMES Or POS(MDS):

PROGRAM OBJECTIVES (POs)

PO1: Engage in continuous reflective leaning in the context of technology and scientific advancement.

PO2: Identify the need and scope of the Inter disciplinary area.

PO3: Understand the professional, ethical, and social responsibilities.

PO4: Enhance disciplinary competency, employability, and technical skills.

PROGRAMME SPECIFIC OUTCOME:

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Abstract Thinking: Ability to understand the abstract concepts that lead to various data science theories in Mathematics, Statistics and Computer science.

PSO2: Problem Analysis and Design Ability: To identify analyse and design solutions for data science problems using fundamental principles of mathematics, Statistics, computing data sciences, and relevant domain disciplines.

PSO3: Modern software tool usage: Acquire the skills in handling data science programming tools towards problem solving and solution analysis for domain specific problems.

PSO4: Societal and Environmental Concern: Utilize the data science theories for societal and environmental concerns.

PSO5: Professional Ethics: Understand and commit to professional ethics and cyber regulation

	COURSE OUTCOMES	**BLOOM'S TAXONOMY LEVEL**
CO1	**CO1:** To examine different concepts of probability and apply them in real life applications.	IV (ANALYZE)
CO2	**CO2:** To make use of different concepts of random variables in understanding scope of different distributions.	II (UNDERSTAND)
CO3	**CO3**: To utilize different concepts of expectations in understanding the characteristics of distributions.	III (APPLY)
CO4	**CO4:** To understand the relationships between different discrete distributions.	II (UNDERSTAND)
CO5	**CO5:** To explain the different characteristics of continuous distributions and understand which one to use for different cases.	II (UNDERSTAND)

Table 1: CO, PO, PSO MAPPING

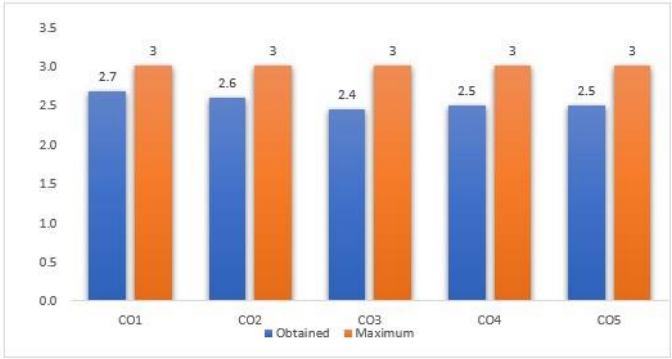
Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1	H		S	H					H	H		H	
2	H	H		H					H	H		H	
3		H		H					H	H		H	
4	H	H		H					H	H		H	
5		H		H					H	H		H	

H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	72.2	1.0			100.0	3.0	100.0	3.0	100.0	3.0	72.2	1.0	2.2	88.9	3.0	3.0	2.7
CO2	72.2	1.0			100.0	3.0			100.0	3.0	72.2	1.0	2.0	88.9	3.0	3.0	2.6
CO3	72.2	1.0	61.1	0.0	100.0	3.0			100.0	3.0	72.2	1.0	1.6	88.9	3.0	3.0	2.4
CO4			61.1	0.0	100.0	3.0			100.0	3.0	72.2	1.0	1.8	88.9	3.0	3.0	2.5
CO5			61.1	0.0	100.0	3.0			100.0	3.0	72.2	1.0	1.8	88.9	3.0	3.0	2.5

AVERAGE	AVERAGE
3	2.544

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The attainment is 3 for the internals and is satisfactory. It is observed that more concentration is needed on distributions.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.68			H 2.68				
CO2	H 2.6	H 2.6		H 2.6				
CO3		H 2.44		H 2.44				
CO4	H 2.5	H 2.5		H 2.5				
CO5		H 2.5		H 2.5				
AVERAGE OF COS FOR POS	2.593333333	2.51		2.544				
AVERAGE OF POS	2.56444	2.51		2.5168				
AVERAGE	2.530414815							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: ARTIFICIAL INTELLIGENCE

COURSE CODE: MDS22104

CREDITS: 4

DEPARTMENT: M.Sc. DATA SCIENCE

PROGRAMME OUTCOMES Or POS(MDS):

PROGRAM OBJECTIVES (POs)

PO1: Engage in continuous reflective leaning in the context of technology and scientific advancement.

PO2: Identify the need and scope of the Inter disciplinary area.

PO3: Understand the professional, ethical, and social responsibilities.

PO4: Enhance disciplinary competency, employability, and technical skills.

PROGRAMME SPECIFIC OUTCOME:

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Abstract Thinking: Ability to understand the abstract concepts that lead to various data science theories in Mathematics, Statistics and Computer science.

PSO2: Problem Analysis and Design Ability: To identify analyse and design solutions for data science problems using fundamental principles of mathematics, Statistics, computing data sciences, and relevant domain disciplines.

PSO3: Modern software tool usage: Acquire the skills in handling data science programming tools towards problem solving and solution analysis for domain specific problems.

PSO4: Societal and Environmental Concern: Utilize the data science theories for societal and environmental concerns.

PSO5: Professional Ethics: Understand and commit to professional ethics and cyber regulation

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Design a data base for a system using E-R data model and Relational Data model.	VI (CREATE)
CO2	**CO2:** Design logical database with all integrity constraints over relations.	VI (CREATE)
CO3	**CO3:** Apply normalization steps in database design and removal of data anomalies.	III (APPLY)
CO4	**CO4:** Extend the characteristics of database transactions	II (UNDERSTAND)
CO5	**CO5:** Distinguish the different types ofNoSQL databases	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

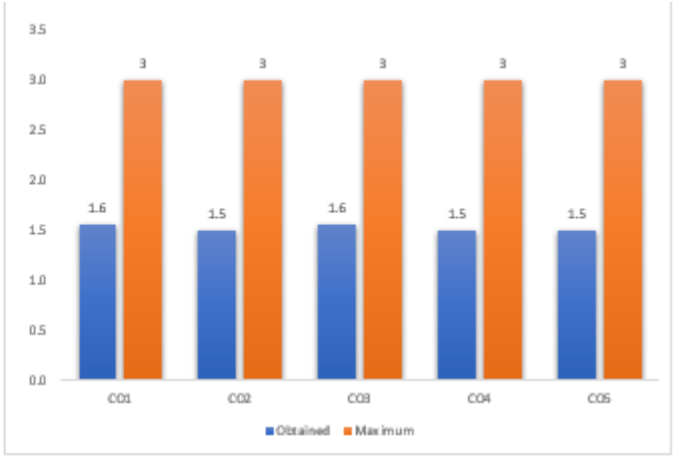
Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1	S	H	H	S					S	H	H	S	H
2	S	H	H	H					H	S	H	S	H
3	H	H	S	H					S	S	S	H	H
4	H	S	S	H					H	H	S	H	S
5	H	S	S	H					S	H	S	H	S

H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	co wise internal	pass %	Attainment level	co wise external average	co wise total
CO1	91.7	3.0			100.0	3.0	100.0	3.0	100.0	3.0	63.9	0.0	2.4	69.4	1.0	1.0	1.6
CO2	91.7	3.0			100.0	3.0			100.0	3.0	63.9	0.0	2.3	69.4	1.0	1.0	1.5
CO3	91.7	3.0	100.0	3.0	100.0	3.0			100.0	3.0	63.9	0.0	2.4	69.4	1.0	1.0	1.6
CO4			100.0	3.0	100.0	3.0			100.0	3.0	63.9	0.0	2.3	69.4	1.0	1.0	1.5
CO5			100.0	3.0	100.0	3.0			100.0	3.0	63.9	0.0	2.3	69.4	1.0	1.0	1.5

AVERAGE	AVERAGE
1	1.524

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1	PO2	PO3	PO4
CO1		H 1.56	H 1.56	
CO2		H 1.5	H 1.5	H 1.5
CO3	H 1.56	H 1.56		H 1.56
CO4	H 1.5			H 1.5
CO5	H 1.5			H 1.5
AVERAGE OF COS FOR POS	1.52	1.54	1.53	1.515
AVERAGE OF POS	1.52	1.53333333	1.515	1.515
AVERAGE	1.520833333			

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: ADVANCED DATABASES

COURSE CODE: MDS20107

CREDITS: 4

DEPARTMENT: M.Sc. DATA SCIENCE

PROGRAMME OUTCOMES Or POS(MDS):

PROGRAM OBJECTIVES (POs)

PO1: Engage in continuous reflective leaning in the context of technology and scientific advancement.

PO2: Identify the need and scope of the Inter disciplinary area.

PO3: Understand the professional, ethical, and social responsibilities.

PO4: Enhance disciplinary competency, employability, and technical skills.

PROGRAMME SPECIFIC OUTCOME:

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Abstract Thinking: Ability to understand the abstract concepts that lead to various data science theories in Mathematics, Statistics and Computer science.

PSO2: Problem Analysis and Design Ability: To identify analyse and design solutions for data science problems using fundamental principles of mathematics, Statistics, computing data sciences, and relevant domain disciplines.

PSO3: Modern software tool usage: Acquire the skills in handling data science programming tools towards problem solving and solution analysis for domain specific problems.

PSO4: Societal and Environmental Concern: Utilize the data science theories for societal and environmental concerns.

PSO5: Professional Ethics: Understand and commit to professional ethics and cyber regulation

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Design a data base for a system using E-R data model and Relational Data model.	VI (CREATE)
CO2	**CO2:** Design logical database with all integrity constraints over relations.	VI (CREATE)
CO3	**CO3:** Apply normalization steps in database design and removal of data anomalies.	III (APPLY)
CO4	**CO4:** Extend the characteristics of database transactions	II (UNDERSTAND)
CO5	**CO5:** Distinguish the different types ofNoSQL databases	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

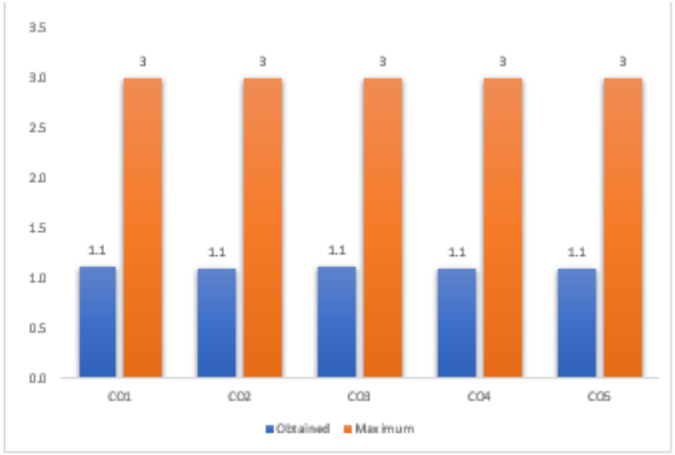
Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1	H	H	S	S					H	S	H	H	S
2	S	H	H	H					S	S	H	H	H
3	S	H	S	H					S	H	S	S	H
4	S	S	H	S					S	H	S	S	S
5	H	S	H	S					H	H	H	H	H

H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	co wise internal	pass %	Attainment level	co wise external average	co wise total
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	80.6	2.0	2.8	27.8	0.0	0.0	1.1
CO2	100.0	3.0			100.0	3.0			100.0	3.0	80.6	2.0	2.8	27.8	0.0	0.0	1.1
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	80.6	2.0	2.8	27.8	0.0	0.0	1.1
CO4			100.0	3.0	100.0	3.0			100.0	3.0	80.6	2.0	2.8	27.8	0.0	0.0	1.1
CO5			100.0	3.0	100.0	3.0			100.0	3.0	80.6	2.0	2.8	27.8	0.0	0.0	1.1

AVERAGE	AVERAGE
0	1.108

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1		PO2		PO3		PO4	
CO1	H	1.12	H	1.12				
CO2			H	1.1	H	1.1	H	1.1
CO3			H	1.12			H	1.12
CO4					H	1.1		
CO5	H	1.1			H	1.1		
AVERAGE OF COS FOR POS	1.11		1.113333333		1.1		1.11	
AVERAGE OF POS		1.105		1.11111111		1.1		1.11
AVERAGE	1.106527778							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: PYTHON FOR DATA SCIENCE

COURSE CODE: MDS20106

CREDITS: 4

DEPARTMENT: M.Sc. DATA SCIENCE

PROGRAMME OUTCOMES Or POS(MDS):

PROGRAM OBJECTIVES (POs)

PO1: Engage in continuous reflective leaning in the context of technology and scientific advancement.

PO2: Identify the need and scope of the Inter disciplinary area.

PO3: Understand the professional, ethical, and social responsibilities.

PO4: Enhance disciplinary competency, employability, and technical skills.

PROGRAMME SPECIFIC OUTCOME:

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Abstract Thinking: Ability to understand the abstract concepts that lead to various data science theories in Mathematics, Statistics and Computer science.

PSO2: Problem Analysis and Design Ability: To identify analyse and design solutions for data science problems using fundamental principles of mathematics, Statistics, computing data sciences, and relevant domain disciplines.

PSO3: Modern software tool usage: Acquire the skills in handling data science programming tools towards problem solving and solution analysis for domain specific problems.

PSO4: Societal and Environmental Concern: Utilize the data science theories for societal and environmental concerns.

PSO5: Professional Ethics: Understand and commit to professional ethics and cyber regulation

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Design a data base for a system using E-R data model and Relational Data model.	VI (CREATE)
CO2	**CO2:** Design logical database with all integrity constraints over relations.	VI (CREATE)
CO3	**CO3:** Apply normalization steps in database design and removal of data anomalies.	III (APPLY)
CO4	**CO4:** Extend the characteristics of database transactions	II (UNDERSTAND)
CO5	**CO5:** Distinguish the different types ofNoSQL databases	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

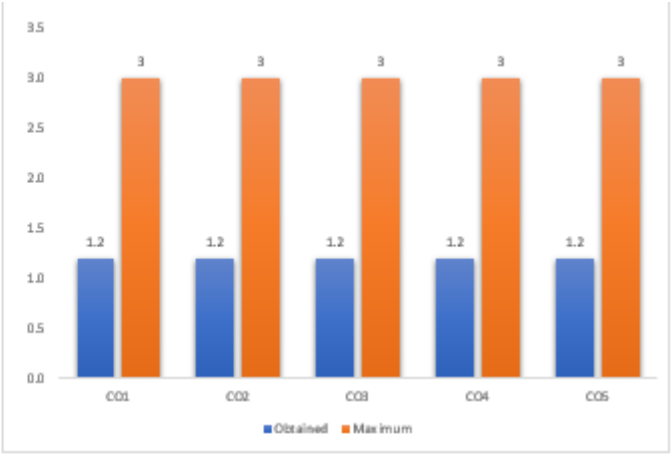
Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1	H	S	H	H					S	H	S	S	H
2	H	H	H	S					H	H	H	S	S
3	S	H	H	H					S	H	S	S	H
4	H	H	S	S					S	H	H	H	S
5	S	S	S	H					S	S	H	H	H

H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	co wise internal	pass %	Attainment level	co wise external average	co wise total
CO1	97.2	3.0			100.0	3.0	100.0	3.0	100.0	3.0	88.9	3.0	3.0	27.8	0.0	0.0	1.2
CO2	97.2	3.0			100.0	3.0			100.0	3.0	88.9	3.0	3.0	27.8	0.0	0.0	1.2
CO3	97.2	3.0	100.0	3.0	100.0	3.0			100.0	3.0	88.9	3.0	3.0	27.8	0.0	0.0	1.2
CO4			100.0	3.0	100.0	3.0			100.0	3.0	88.9	3.0	3.0	27.8	0.0	0.0	1.2
CO5			100.0	3.0	100.0	3.0			100.0	3.0	88.9	3.0	3.0	27.8	0.0	0.0	1.2

AVERAGE	AVERAGE
0	1.2

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1	PO2	PO3	PO4
CO1	H 1.2		H 1.2	H 1.2
CO2	H 1.2	H 1.2	H 1.2	
CO3		H 1.2	H 1.2	H 1.2
CO4	H 1.2	H 1.2		
CO5				H 1.2
AVERAGE OF COS FOR POS	1.2	1.2	1.2	1.2
AVERAGE OF POS	1.2	1.2	1.2	1.2
AVERAGE	1.2			

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: DEEP LEARNING

COURSE CODE: MDS21303

CREDITS: 4

DEPARTMENT: M.Sc. DATA SCIENCE

PROGRAMME OUTCOMES Or POS(MDS):

PROGRAM OBJECTIVES (POs)

PO1: Engage in continuous reflective leaning in the context of technology and scientific advancement.

PO2: Identify the need and scope of the Inter disciplinary area.

PO3: Understand the professional, ethical, and social responsibilities.

PO4: Enhance disciplinary competency, employability, and technical skills.

PROGRAMME SPECIFIC OUTCOME:

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Abstract Thinking: Ability to understand the abstract concepts that lead to various data science theories in Mathematics, Statistics and Computer science.

PSO2: Problem Analysis and Design Ability: To identify analyse and design solutions for data science problems using fundamental principles of mathematics, Statistics, computing data sciences, and relevant domain disciplines.

PSO3: Modern software tool usage: Acquire the skills in handling data science programming tools towards problem solving and solution analysis for domain specific problems.

PSO4: Societal and Environmental Concern: Utilize the data science theories for societal and environmental concerns.

PSO5: Professional Ethics: Understand and commit to professional ethics and cyber regulation

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Design a data base for a system using E-R data model and Relational Data model.	VI (CREATE)
CO2	**CO2:** Design logical database with all integrity constraints over relations.	VI (CREATE)
CO3	**CO3:** Apply normalization steps in database design and removal of data anomalies.	III (APPLY)
CO4	**CO4:** Extend the characteristics of database transactions	II (UNDERSTAND)
CO5	**CO5:** Distinguish the different types ofNoSQL databases	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

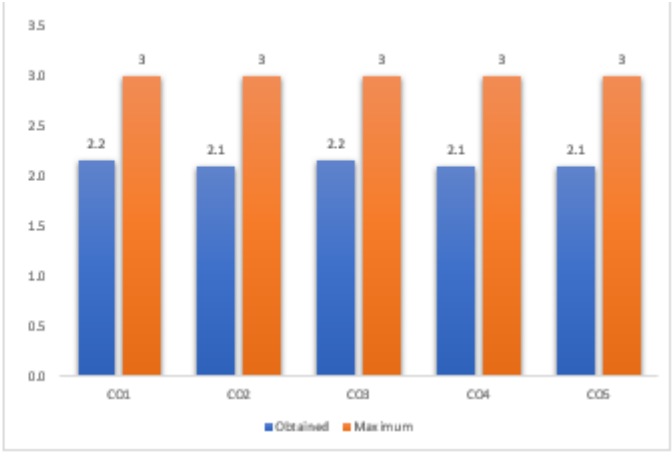
Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1	S	H	H	S					H	H	S	S	S
2	S	H	H	H					S	H	H	H	H
3	S	S	H	S					S	H	H	H	H
4	H	S	H	H					H	H	H	H	H
5	H	S	S	H					H	S	S	H	S

H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	co wise internal	pass %	Attainment level	co wise external average	co wise total
CO1	97.2	3.0			97.2	3.0	100.0	3.0	100.0	3.0	50.0	0.0	2.4	80.6	2.0	2.0	2.2
CO2	97.2	3.0			97.2	3.0			100.0	3.0	50.0	0.0	2.3	80.6	2.0	2.0	2.1
CO3	97.2	3.0	97.2	3.0	97.2	3.0			100.0	3.0	50.0	0.0	2.4	80.6	2.0	2.0	2.2
CO4			97.2	3.0	97.2	3.0			100.0	3.0	50.0	0.0	2.3	80.6	2.0	2.0	2.1
CO5			97.2	3.0	97.2	3.0			100.0	3.0	50.0	0.0	2.3	80.6	2.0	2.0	2.1

AVERAGE	AVERAGE
2	2.124

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1		PO2		PO3		PO4	
CO1			H	2.16	H	2.16		
CO2			H	2.1	H	2.1	H	2.1
CO3					H	2.16		
CO4	H	2.1			H	2.1	H	2.1
CO5	H	2.1					H	2.1
AVERAGE OF COS FOR POS	2.1		2.13		2.13		2.1	
AVERAGE OF POS	2.1		2.115		2.1225		2.1	
AVERAGE	2.109375							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: BIG DATA ANALYTICS

COURSE CODE: MDS21306

CREDITS: 4

DEPARTMENT: M.Sc. DATA SCIENCE

PROGRAMME OUTCOMES Or POS(MDS):

PROGRAM OBJECTIVES (POs)

PO1: Engage in continuous reflective leaning in the context of technology and scientific advancement.

PO2: Identify the need and scope of the Inter disciplinary area.

PO3: Understand the professional, ethical, and social responsibilities.

PO4: Enhance disciplinary competency, employability, and technical skills.

PROGRAMME SPECIFIC OUTCOME:

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Abstract Thinking: Ability to understand the abstract concepts that lead to various data science theories in Mathematics, Statistics and Computer science.

PSO2: Problem Analysis and Design Ability: To identify analyse and design solutions for data science problems using fundamental principles of mathematics, Statistics, computing data sciences, and relevant domain disciplines.

PSO3: Modern software tool usage: Acquire the skills in handling data science programming tools towards problem solving and solution analysis for domain specific problems.

PSO4: Societal and Environmental Concern: Utilize the data science theories for societal and environmental concerns.

PSO5: Professional Ethics: Understand and commit to professional ethics and cyber regulation

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Design a data base for a system using E-R data model and Relational Data model.	VI (CREATE)
CO2	**CO2:** Design logical database with all integrity constraints over relations.	VI (CREATE)
CO3	**CO3:** Apply normalization steps in database design and removal of data anomalies.	III (APPLY)
CO4	**CO4:** Extend the characteristics of database transactions	II (UNDERSTAND)
CO5	**CO5:** Distinguish the different types ofNoSQL databases	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

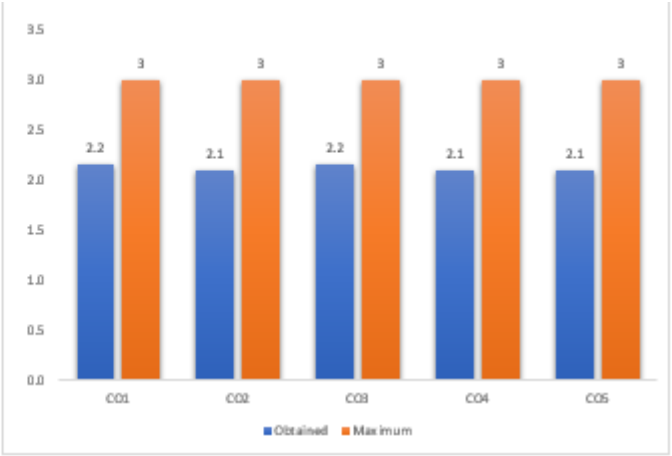
Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1	H	S	H	S					H	S	H	H	H
2	H	H	H	S					H	H	H	S	H
3	H	H	H	H					H	H	H	H	S
4	H	H	H	H					S	S	S	S	H
5	S	H	H	H					H	S	S	H	H

H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	co wise internal	pass %	Attainment level	co wise external average	co wise total
CO1	100.0	3.0			97.2	3.0	100.0	3.0	100.0	3.0	58.3	0.0	2.4	77.8	2.0	2.0	2.2
CO2	100.0	3.0			97.2	3.0			100.0	3.0	58.3	0.0	2.3	77.8	2.0	2.0	2.1
CO3	100.0	3.0	100.0	3.0	97.2	3.0			100.0	3.0	58.3	0.0	2.4	77.8	2.0	2.0	2.2
CO4			100.0	3.0	97.2	3.0			100.0	3.0	58.3	0.0	2.3	77.8	2.0	2.0	2.1
CO5			100.0	3.0	97.2	3.0			100.0	3.0	58.3	0.0	2.3	77.8	2.0	2.0	2.1

AVERAGE	AVERAGE
2	2.124

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1		PO2		PO3		PO4	
CO1	H	2.16			H	2.16		
CO2	H	2.1	H	2.1	H	2.1		
CO3	H	2.16	H	2.16	H	2.16	H	2.16
CO4	H	2.1	H	2.1	H	2.1	H	2.1
CO5			H	2.1	H	2.1	H	2.1
AVERAGE OF COS FOR POS	2.13		2.115		2.124		2.12	
AVERAGE OF POS	2.1225		2.115		2.1168		2.12	
AVERAGE	2.118575							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: NATURAL LANGUAGE PROCESSING

COURSE CODE: MDS21307

CREDITS: 4

DEPARTMENT: M.Sc. DATA SCIENCE

PROGRAMME OUTCOMES Or POS(MDS):

PROGRAM OBJECTIVES (POs)

PO1: Engage in continuous reflective leaning in the context of technology and scientific advancement.

PO2: Identify the need and scope of the Inter disciplinary area.

PO3: Understand the professional, ethical, and social responsibilities.

PO4: Enhance disciplinary competency, employability, and technical skills.

PROGRAMME SPECIFIC OUTCOME:

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Abstract Thinking: Ability to understand the abstract concepts that lead to various data science theories in Mathematics, Statistics and Computer science.

PSO2: Problem Analysis and Design Ability: To identify analyse and design solutions for data science problems using fundamental principles of mathematics, Statistics, computing data sciences, and relevant domain disciplines.

PSO3: Modern software tool usage: Acquire the skills in handling data science programming tools towards problem solving and solution analysis for domain specific problems.

PSO4: Societal and Environmental Concern: Utilize the data science theories for societal and environmental concerns.

PSO5: Professional Ethics: Understand and commit to professional ethics and cyber regulation

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Design a data base for a system using E-R data model and Relational Data model.	VI (CREATE)
CO2	**CO2:** Design logical database with all integrity constraints over relations.	VI (CREATE)
CO3	**CO3:** Apply normalization steps in database design and removal of data anomalies.	III (APPLY)
CO4	**CO4:** Extend the characteristics of database transactions	II (UNDERSTAND)
CO5	**CO5:** Distinguish the different types ofNoSQL databases	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

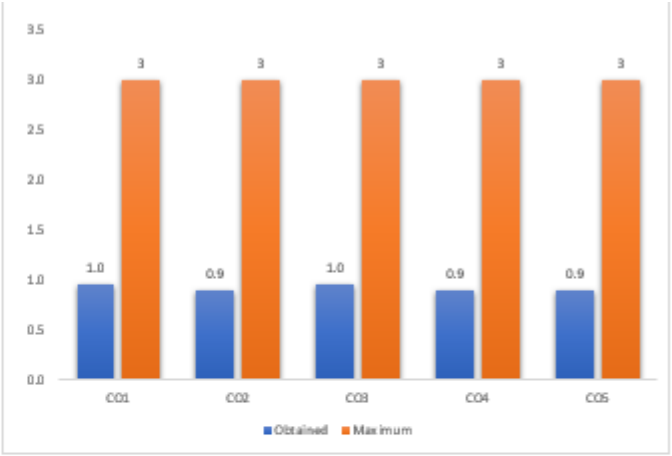
Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1	H	H	H	S					H	H	H	H	H
2	H	H	H	H					H	H	S	S	H
3	H	H	H	S					H	H	H	H	S
4	S	S	H	H					S	H	H	H	H
5	H	S	S	H					H	H	H	S	H

H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	co wise internal	pass %	Attainment level	co wise external average	co wise total
CO1	86.1	3.0			97.2	3.0	100.0	3.0	100.0	3.0	44.4	0.0	2.4	55.6	0.0	0.0	1.0
CO2	86.1	3.0			97.2	3.0			100.0	3.0	44.4	0.0	2.3	55.6	0.0	0.0	0.9
CO3	86.1	3.0	97.2	3.0	97.2	3.0			100.0	3.0	44.4	0.0	2.4	55.6	0.0	0.0	1.0
CO4			97.2	3.0	97.2	3.0			100.0	3.0	44.4	0.0	2.3	55.6	0.0	0.0	0.9
CO5			97.2	3.0	97.2	3.0			100.0	3.0	44.4	0.0	2.3	55.6	0.0	0.0	0.9

AVERAGE	AVERAGE
0	0.924

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1		PO2		PO3		PO4	
CO1	H	0.96	H	0.96	H	0.96		
CO2	H	0.9	H	0.9	H	0.9	H	0.9
CO3	H	0.96	H	0.96	H	0.96		
CO4					H	0.9	H	0.9
CO5	H	0.9					H	0.9
AVERAGE OF COS FOR POS	0.93		0.94		0.93		0.9	
AVERAGE OF POS	0.9225		0.9333333		0.9225		0.9	
AVERAGE	0.919583333							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: INTERNET OF THINGS

COURSE CODE: MDS21305

CREDITS: 4

DEPARTMENT: M.Sc Data Science

PROGRAMME OUTCOMES Or POs :

MSc.

PO1: Engage in continuous reflective leaning in the context of technology and scientific advancement

PO2: Identify the need and scope of the Inter disciplinary area.

PO3: Understand the professional, ethical, and social responsibilities.

PO4: Enhance disciplinary competency, employability and leadership skills.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE):

PSO1: Abstract Thinking: Ability to understand the abstract concepts that lead to various data science theories in Mathematics, Statistics and Computer science.

PSO2: Problem Analysis and Design Ability: To identify analyze and design solutions for data science problems using fundamental principles of mathematics, Statistics, computing data sciences, andrelevant domain disciplines.

PSO3: Modern software tool usage: Acquire the skills in handling data science programming tools towards problem solving and solution analysis for domain specific problems.

PSO4: Societal and Environmental Concern: Utilize the data science theories for societal and environmental concerns.

PSO5: Professional Ethics: Understand and commit to professional ethics and cyber regulation.

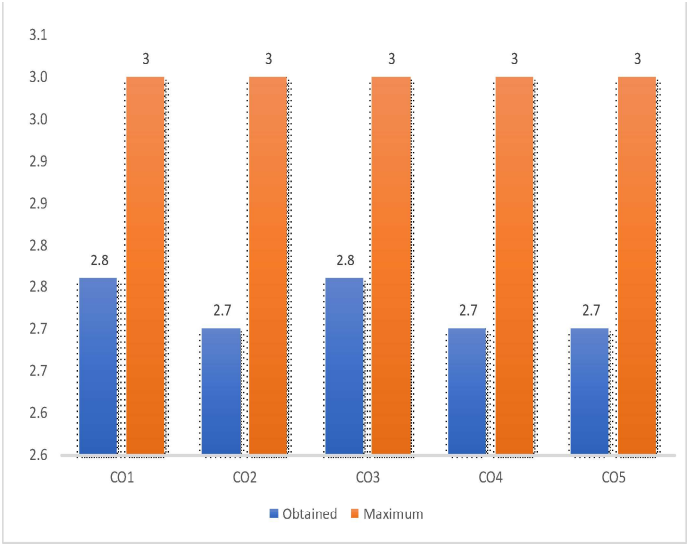
	COURSE OUTCOMES	**BLOOM'S TAXONOMY LEVEL**
CO1	Identify the importance of IOT and its applications.	II (UNDERSTAND)
CO2	Differentiate between IOT and M2M, SDN and NFV	IV(ANALYZE)
CO3	Apply IOT design methodology.	V(EVALUATE)
CO4	Understand building of IOT devices and Raspberry PI.	II (UNDERSTAND)
CO5	Explain working of application of IOT.	III(APPLYING)

TABLE 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P08**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
1	**H**	**H**								**S**	**H**	**H**	
2	**H**	**H**								**S**	**H**	**S**	
3	**H**	**H**		**H**						**H**	**H**	**H**	
4	**H**	**H**		**H**						**H**	**H**	**S**	
5	**H**	**H**		**H**						**H**	**H**	**H**	

H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	97.2	3.0			100.0	3.0	100.0	3.0	100.0	3.0	44.4	0.0	2.4	100.0	3.0	3.0	2.8
CO2	97.2	3.0			100.0	3.0			100.0	3.0	44.4	0.0	2.3	100.0	3.0	3.0	2.7
CO3	97.2	3.0	97.2	3.0	100.0	3.0			100.0	3.0	44.4	0.0	2.4	100.0	3.0	3.0	2.8
CO4			97.2	3.0	100.0	3.0			100.0	3.0	44.4	0.0	2.3	100.0	3.0	3.0	2.7
CO5			97.2	3.0	100.0	3.0			100.0	3.0	44.4	0.0	2.3	100.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

Table 3: PROGRAMME OUTCOME MAPPING

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.76	H 2.76						
CO2	H 2.7	H 2.7						
CO3	H 2.76	H 2.76		H 2.76				
CO4	H 2.7	H 2.7		H 2.7				
CO5	H 2.7	H 2.7		H 2.7				
AVERAGE OF COS FOR POS	2.724	2.724		2.72				
AVERAGE OF POS	2.7168	2.7168		2.72				
AVERAGE	2.717866667							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: SOCIAL MEDIA ANALYTICS

COURSE CODE: MDS21304B

CREDITS: 4

DEPARTMENT: M.Sc. DATA SCIENCE

PROGRAMME OUTCOMES Or POS(MDS):

PROGRAM OBJECTIVES (POs)

PO1: Engage in continuous reflective leaning in the context of technology and scientific advancement.

PO2: Identify the need and scope of the Inter disciplinary area.

PO3: Understand the professional, ethical, and social responsibilities.

PO4: Enhance disciplinary competency, employability, and technical skills.

PROGRAMME SPECIFIC OUTCOME:

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Abstract Thinking: Ability to understand the abstract concepts that lead to various data science theories in Mathematics, Statistics and Computer science.

PSO2: Problem Analysis and Design Ability: To identify analyse and design solutions for data science problems using fundamental principles of mathematics, Statistics, computing data sciences, and relevant domain disciplines.

PSO3: Modern software tool usage: Acquire the skills in handling data science programming tools towards problem solving and solution analysis for domain specific problems.

PSO4: Societal and Environmental Concern: Utilize the data science theories for societal and environmental concerns.

PSO5: Professional Ethics: Understand and commit to professional ethics and cyber regulation

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Design a data base for a system using E-R data model and Relational Data model.	VI (CREATE)
CO2	**CO2:** Design logical database with all integrity constraints over relations.	VI (CREATE)
CO3	**CO3:** Apply normalization steps in database design and removal of data anomalies.	III (APPLY)
CO4	**CO4:** Extend the characteristics of database transactions	II (UNDERSTAND)
CO5	**CO5:** Distinguish the different types ofNoSQL databases	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

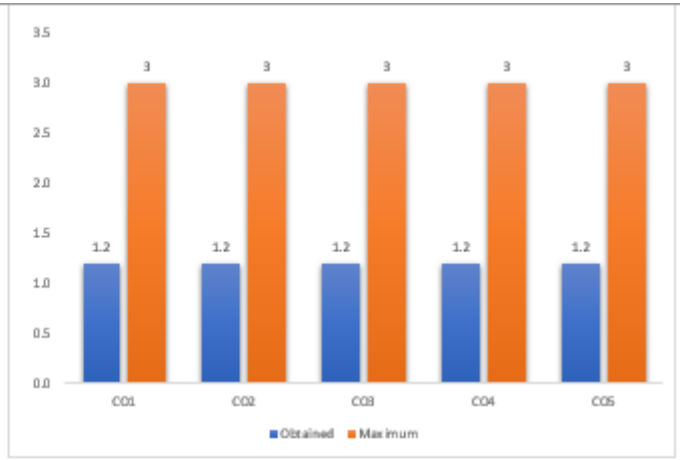
Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1	H	H	H	S					H	H	H	H	H
2	H	H	H	H					H	H	S	S	H
3	H	H	H	S					H	H	H	H	S
4	S	S	H	H					S	H	H	H	H
5	H	S	S	H					H	H	H	S	H

H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	co wise internal	pass %	Attainment level	co wise external average	co wise total
CO1	94.4	3.0			94.4	3.0	100.0	3.0	100.0	3.0	94.4	3.0	3.0	61.1	0.0	0.0	1.2
CO2	94.4	3.0			94.4	3.0			100.0	3.0	94.4	3.0	3.0	61.1	0.0	0.0	1.2
CO3	94.4	3.0	100.0	3.0	94.4	3.0			100.0	3.0	94.4	3.0	3.0	61.1	0.0	0.0	1.2
CO4			100.0	3.0	94.4	3.0			100.0	3.0	94.4	3.0	3.0	61.1	0.0	0.0	1.2
CO5			100.0	3.0	94.4	3.0			100.0	3.0	94.4	3.0	3.0	61.1	0.0	0.0	1.2

AVERAGE	AVERAGE
0	1.2

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1		PO2		PO3		PO4	
CO1	H	1.2	H	1.2	H	1.2		
CO2	H	1.2	H	1.2	H	1.2	H	1.2
CO3	H	1.2	H	1.2	H	1.2		
CO4					H	1.2	H	1.2
CO5	H	1.2					H	1.2
AVERAGE OF COS FOR POS	1.2		1.2		1.2		1.2	
AVERAGE OF POS		1.2		1.2		1.2		1.2
AVERAGE	1.2							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: CLOUD COMPUTING

COURSE CODE: MDS21304A

CREDITS: 4

DEPARTMENT: M.Sc. DATA SCIENCE

PROGRAMME OUTCOMES Or POS(MDS):

PROGRAM OBJECTIVES (POs)

PO1: Engage in continuous reflective leaning in the context of technology and scientific advancement.

PO2: Identify the need and scope of the Inter disciplinary area.

PO3: Understand the professional, ethical, and social responsibilities.

PO4: Enhance disciplinary competency, employability, and technical skills.

PROGRAMME SPECIFIC OUTCOME:

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Abstract Thinking: Ability to understand the abstract concepts that lead to various data science theories in Mathematics, Statistics and Computer science.

PSO2: Problem Analysis and Design Ability: To identify analyse and design solutions for data science problems using fundamental principles of mathematics, Statistics, computing data sciences, and relevant domain disciplines.

PSO3: Modern software tool usage: Acquire the skills in handling data science programming tools towards problem solving and solution analysis for domain specific problems.

PSO4: Societal and Environmental Concern: Utilize the data science theories for societal and environmental concerns.

PSO5: Professional Ethics: Understand and commit to professional ethics and cyber regulation

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Design a data base for a system using E-R data model and Relational Data model.	VI (CREATE)
CO2	**CO2:** Design logical database with all integrity constraints over relations.	VI (CREATE)
CO3	**CO3:** Apply normalization steps in database design and removal of data anomalies.	III (APPLY)
CO4	**CO4:** Extend the characteristics of database transactions	II (UNDERSTAND)
CO5	**CO5:** Distinguish the different types ofNoSQL databases	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

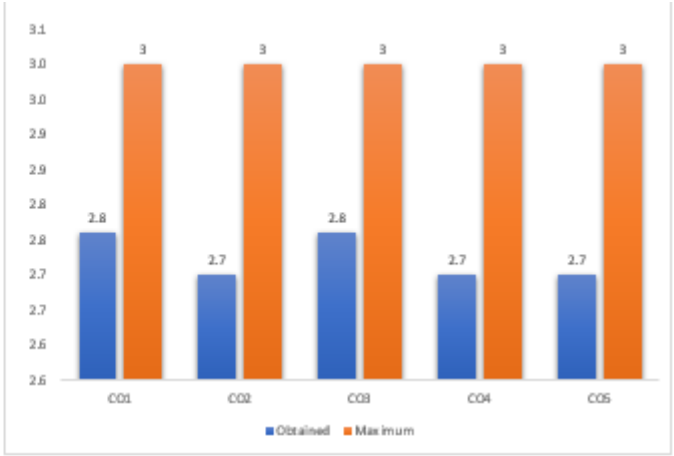
Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1	H	H	S	H					H	H	S	H	H
2	H	H	S	S					H	H	S	H	H
3	H	H	H	H					H	H	S	H	S
4	S	H	H	S					S	H	H	H	S
5	H	H	H	H					H	S	H	H	H

H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendence			External Exam			
	pass%	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	co wise internal	pass %	Attainment level	co wise external average	co wise total
CO1	100.0	3.0			94.4	3.0	100.0	3.0	100.0	3.0	61.1	0.0	2.4	94.4	3.0	3.0	2.8
CO2	100.0	3.0			94.4	3.0			100.0	3.0	61.1	0.0	2.3	94.4	3.0	3.0	2.7
CO3	100.0	3.0	100.0	3.0	94.4	3.0			100.0	3.0	61.1	0.0	2.4	94.4	3.0	3.0	2.8
CO4			100.0	3.0	94.4	3.0			100.0	3.0	61.1	0.0	2.3	94.4	3.0	3.0	2.7
CO5			100.0	3.0	94.4	3.0			100.0	3.0	61.1	0.0	2.3	94.4	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1		PO2		PO3		PO4	
CO1	H	2.76	H	2.76			H	2.76
CO2	H	2.7	H	2.7				
CO3	H	2.76	H	2.76	H	2.76	H	2.76
CO4			H	2.7	H	2.7		
CO5	H	2.7	H	2.7	H	2.7	H	2.7
AVERAGE OF COS FOR POS	2.73		2.724		2.72		2.74	
AVERAGE OF POS	2.7225		2.7168		2.72		2.7333	
AVERAGE	2.723158333							