COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

A.Y. 2022 – 23 ODD SEMESTER

COURSE TITLE: GENERAL ENGLISH I

COURSE CODE: EN18101

CREDITS: 3

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Distinguish between words which are either spelt or pronounced alike, yet render distinct meanings; imparting a sound clarity on everyday usage and miscommunications embedded in language	III (APPLY)
CO2	**CO2:** Improve diction and gain understanding on the tense component, a pivotal constituent for language structuring.	IV(ANALYZE)
CO3	**CO3:** Identify with economical word constructions, paying specific attention to vocabulary building in English	III (APPLY)
CO4	**CO4:** Learn subject-verb agreement, the basic part involved in sentence constructing to improve their linguistic skills	VI(CREATE)
CO5	**CO5:** Polish their language efficiency through the grammar component of commonly confused and misspelt words, and errors related to vocabulary and different aspects of grammar, which would be seemingly helpful for language delivery	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

Course	**Programme Outcomes**	**Program Specific outcomes**

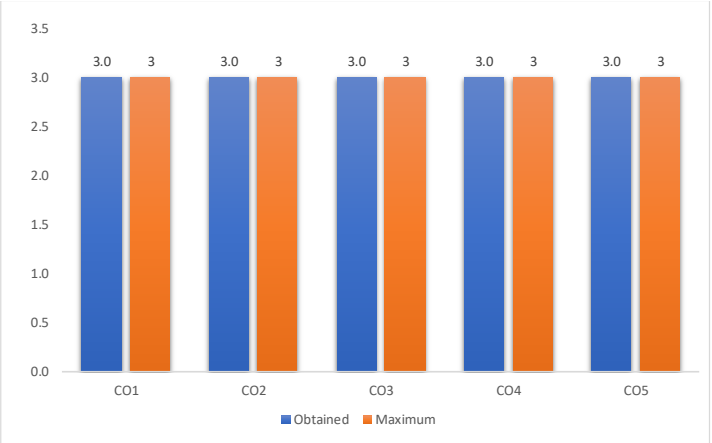
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	**H**		**H**	**H**			**S**	**H**		**H**		**H**	
2	**S**		**S**	**H**			**S**	**S**		**H**		**H**	
3	**H**		**H**	**H**	**S**		**H**	**S**		**H**		**H**	
4	**S**		**S**	**H**	**H**		**S**	**H**		**H**		**H**	
5	**H**		**H**	**H**	**S**		**H**	**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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	94.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	86.0	3.0	3.0	100.0	3.0	3.0	3.0
CO2	94.0	3.0			100.0	3.0			100.0	3.0	86.0	3.0	3.0	100.0	3.0	3.0	3.0
CO3	94.0	3.0	92.0	3.0	100.0	3.0			100.0	3.0	86.0	3.0	3.0	100.0	3.0	3.0	3.0
CO4			92.0	3.0	100.0	3.0			100.0	3.0	86.0	3.0	3.0	100.0	3.0	3.0	3.0
CO5			92.0	3.0	100.0	3.0			100.0	3.0	86.0	3.0	3.0	100.0	3.0	3.0	3.0

AVERAGE	AVERAGE
3	3

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	PO5	PO6	PO7	PO8
CO1	H 3		H 3	H 3				H 3
CO2				H 3				
CO3	H 3		H 3	H 3			H 3	
CO4				H 3	H 3			H 3
CO5	H 3		H 3	H 3			H 3	
AVERAGE OF COS FOR POS	3		3	3	3		3	3
AVERAGE OF POS	3		3	3	3		3	3
AVERAGE	3							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: VALUE EDUCATION & PERSONALITY DEVELOPMENT

COURSE CODE: VE18101

CREDITS: 2

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

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PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

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PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Students will be able to differentiate Accepted norms and counter values and be able to **identify** the various Dimensions of Human Development	III (APPLY)
CO2	**CO2:** Students will be able to **demonstrate** Love and Experience of God and identify the Basic Issues of Life and Happiness as a life goal	IV(ANALYZE)
CO3	**CO3:** They will able to **understand** the importance of concern for others and sritique the various problems that deter the growth of the society	III (APPLY)
CO4	**CO4:** The students will be able to recognize the traits of a good personality and practice Self exploration	VI(CREATE)
CO5	**CO5:** Students will be able to interpret the purpose of life and goal setting and demonstrate self-management	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

Course	**Programme Outcomes**	**Program Specific outcomes**

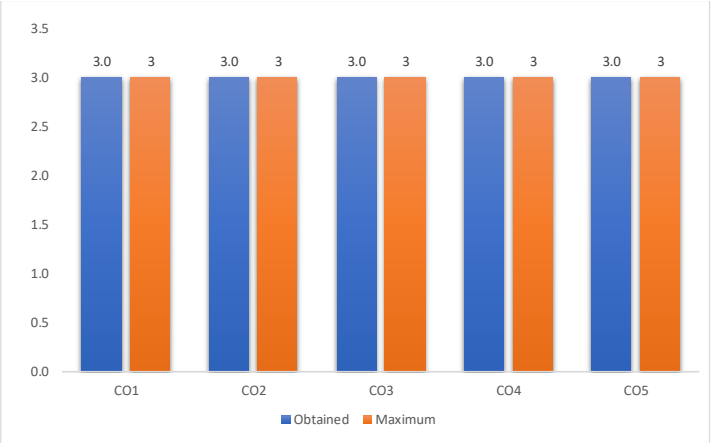
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	**H**		**H**	**S**			**S**	**S**		**S**		**H**	
2	**H**		**H**	**H**			**S**	**S**		**H**		**H**	
3	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	
4	**S**		**H**	**H**	**S**		**S**	**S**		**H**		**S**	
5	**H**		**H**	**H**	**S**		**S**	**H**		**H**		**H**	

H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
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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
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CO2	100.0	3.0			100.0	3.0			100.0	3.0	88.0	3.0	3.0	100.0	3.0	3.0	3.0
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	88.0	3.0	3.0	100.0	3.0	3.0	3.0
CO4			100.0	3.0	100.0	3.0			100.0	3.0	88.0	3.0	3.0	100.0	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	88.0	3.0	3.0	100.0	3.0	3.0	3.0

AVERAGE	AVERAGE
3	3

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)

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Instruction:

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OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 3		H 3					
CO2	H 3		H 3	H 3				
CO3	H 3		H 3	H 3	H 3		H 3	
CO4			H 3	H 3				
CO5	H 3		H 3	H 3				H 3
AVERAGE OF COS FOR POS	3		3	3	3		3	3
AVERAGE OF POS	3		3	3	3		3	3
AVERAGE	3							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: FUNDAMENTALS OF INFORMATION TECHNOLOGY

COURSE CODE: BS22101

CREDITS: 3

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

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PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Understand basic computer terminology and number systems.	III (APPLY)
CO2	**CO2:** Learn about operating systems, and its types.	IV(ANALYZE)
CO3	**CO3:** Learn about the applications of Information technology	III (APPLY)
CO4	**CO4:** Importance of system development and the phases of SDLC	VI(CREATE)
CO5	**CO5:** Use of modern means of communications, types of networks and topologies	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

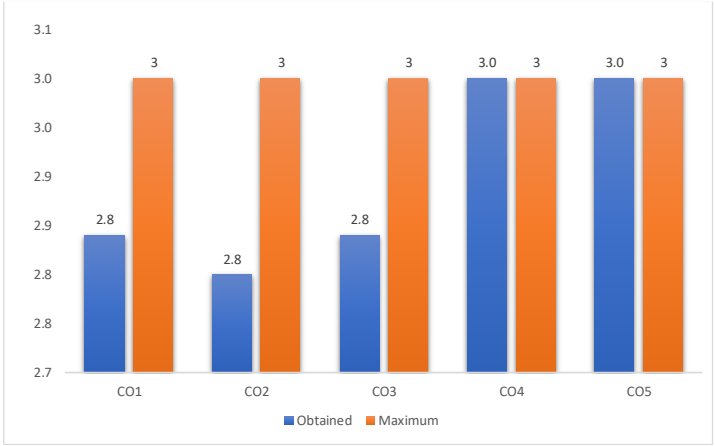
Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	H		H	H			H	H		H		H	
2	S		S	H			S	S		H		H	
3	H		H	H	S		H	S		H		H	
4	H		H	H	H		H	H		H		H	
5	H		H	H	S		H	S		H		H	

H: Highly Supportive **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

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CO1	74.0	1.0			100.0	3.0	98.0	3.0	98.0	3.0	86.0	3.0	2.6	95.9	3.0	3.0	2.8
CO2	74.0	1.0			100.0	3.0			98.0	3.0	86.0	3.0	2.5	95.9	3.0	3.0	2.8
CO3	74.0	1.0	98.0	3.0	100.0	3.0			98.0	3.0	86.0	3.0	2.6	95.9	3.0	3.0	2.8
CO4			98.0	3.0	100.0	3.0			98.0	3.0	86.0	3.0	3.0	95.9	3.0	3.0	3.0
CO5			98.0	3.0	100.0	3.0			98.0	3.0	86.0	3.0	3.0	95.9	3.0	3.0	3.0

AVERAGE	AVERAGE
3	2.896

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)

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OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.84		H 2.84	H 2.84			H 2.84	H 2.84
CO2				H 2.8				
CO3	H 2.84		H 2.84	H 2.84			H 2.84	
CO4	H 3		H 3	H 3	H 3		H 3	H 3
CO5	H 3		H 3	H 3			H 3	
AVERAGE OF COS FOR POS	2.92		2.92	2.896	3		2.92	2.92
AVERAGE OF POS	2.94		2.94	2.9072	3		2.94	2.96
AVERAGE	2.947866667							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: DIFFERENTIAL CALCULUS & NUMBER THEORY

COURSE CODE: MS22101

CREDITS: 5

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

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PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1: understand** the applications of partial differentiation. To estimate maxima and minima of multivariable function	III (APPLY)
CO2	**CO2: Demonstrate** Radius of curvature and Evolutes geometrically	IV(ANALYZE)
CO3	**CO3:** Find Envelopes and Asymptotes	III (APPLY)
CO4	**CO4: Express** the concepts and results of Number Theory	VI(CREATE)
CO5	**CO5: Demonstrate** knowledge and understanding of topics including divisibility, prime numbers, congruences, Diophantine equations.	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

Course	Programme Outcomes	Program Specific outcomes

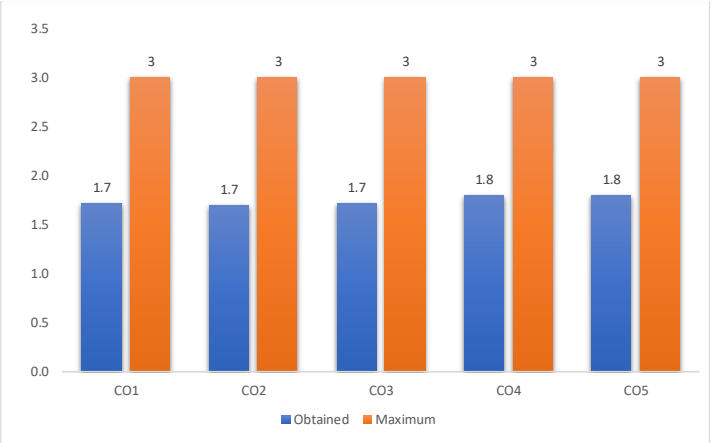
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	**H**		**H**	**S**			**S**	**S**		**S**		**H**	
2	**H**		**H**	**H**			**H**	**S**		**H**		**H**	
3	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	
4	**H**		**H**	**H**	**S**		**H**	**S**		**H**		**S**	
5	**H**		**H**	**H**	**S**		**S**	**H**		**H**		**H**	

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CO2	84.0	2.0			100.0	3.0			100.0	3.0	88.0	3.0	2.8	65.3	1.0	1.0	1.7
CO3	84.0	2.0	96.0	3.0	100.0	3.0			100.0	3.0	88.0	3.0	2.8	65.3	1.0	1.0	1.7
CO4			96.0	3.0	100.0	3.0			100.0	3.0	88.0	3.0	3.0	65.3	1.0	1.0	1.8
CO5			96.0	3.0	100.0	3.0			100.0	3.0	88.0	3.0	3.0	65.3	1.0	1.0	1.8

AVERAGE	AVERAGE
1	1.748

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)

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OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 1.72		H 1.72					
CO2	H 1.7		H 1.7	H 1.7			H 1.7	
CO3	H 1.72		H 1.72	H 1.72	H 1.72		H 1.72	
CO4	H 1.8		H 1.8	H 1.8			H 1.8	
CO5	H 1.8		H 1.8	H 1.8				H 1.8
AVERAGE OF COS FOR POS	1.748		1.748	1.755	1.72		1.74	1.8
AVERAGE OF POS	1.7536		1.7536	1.755	1.72		1.74	1.8
AVERAGE	1.7537							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: DESCRIPTIVE STATISTICS & PROBABILITY

COURSE CODE: BS19025

CREDITS: 4

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

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- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
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PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1: Organize**, manage and present data and Analyze statistical data using measures of central tendency	III (APPLY)
CO2	**CO2: Analyze** the statistical data using dispersion and location.	IV(ANALYZE)
CO3	**CO3: Use** the basic probability rules, including additive and multiplicative laws, using the terms, independent and mutually exclusive events.	III (APPLY)
CO4	**CO4: Develop** the probability density function of transformation of random variables.	VI(CREATE)
CO5	**CO5: : Identify** probabilities, and derive the marginal and conditional distributions of bivariate random variables.	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**	

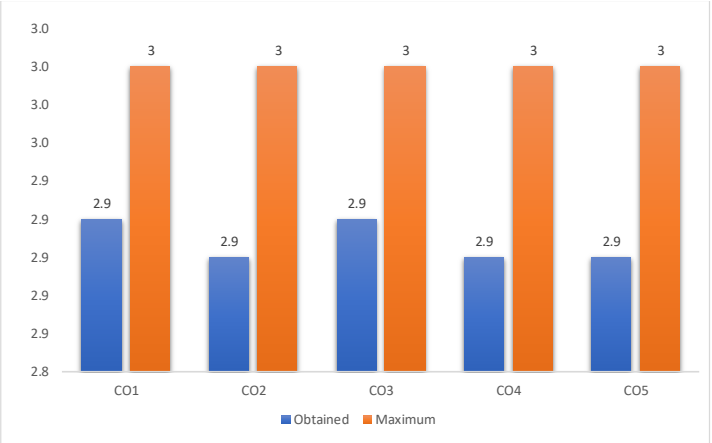
1	**H**		**S**	**H**			**H**	**H**		**H**		**H**	
2	**H**		**H**	**H**			**H**	**H**		**H**		**H**	
3	**H**		**S**	**H**	**S**		**H**	**S**		**H**		**H**	
4	**H**		**H**	**H**	**H**		**H**	**H**		**H**		**H**	
5	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	84.0	2.0	2.8	92.0	3.0	3.0	2.9
CO2	100.0	3.0			100.0	3.0			100.0	3.0	84.0	2.0	2.8	92.0	3.0	3.0	2.9
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	84.0	2.0	2.8	92.0	3.0	3.0	2.9
CO4			100.0	3.0	100.0	3.0			100.0	3.0	84.0	2.0	2.8	92.0	3.0	3.0	2.9
CO5			100.0	3.0	100.0	3.0			100.0	3.0	84.0	2.0	2.8	92.0	3.0	3.0	2.9

AVERAGE	AVERAGE
3	2.908

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	PO5	PO6	PO7	PO8
CO1	H 2.92			H 2.92			H 2.92	H 2.92
CO2	H 2.9		H 2.9	H 2.9			H 2.9	H 2.9
CO3	H 2.92			H 2.92			H 2.92	
CO4	H 2.9		H 2.9	H 2.9	H 2.9		H 2.9	H 2.9
CO5	H 2.9		H 2.9	H 2.9	H 2.9		H 2.9	
AVERAGE OF COS FOR POS	2.908		2.9	2.908	2.9		2.908	2.906666667
AVERAGE OF POS	2.9056		2.9	2.9056	2.9		2.9056	2.902222
AVERAGE	2.90317037							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: PROBLEM SOLVING AND PROGRAMMING IN C

COURSE CODE: BS19123

CREDITS: 4

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Understand the basic introduction of computer and programming language	III (APPLY)
CO2	**CO2:** Identify 'C' data types, operators and data input /output functions	IV(ANALYZE)
CO3	**CO3:** Categorize 'C' control structures, arrays and string concept.	III (APPLY)
CO4	**CO4:** Explain 'C' function, recursion, pointers and dynamic memory allocation	VI(CREATE)
CO5	**CO5:** Express the concept of structures, union and file handling in 'C'.	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**	

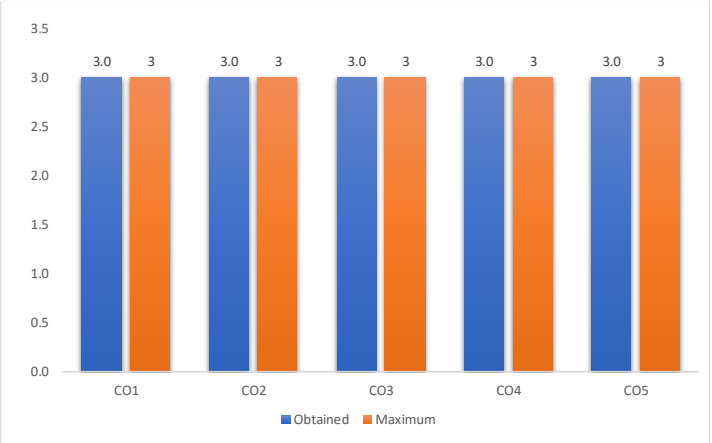
1	**H**		**S**	**H**			**S**	**H**		**H**		**H**	
2	**H**		**H**	**H**			**H**	**H**		**H**		**H**	
3	**H**		**S**	**H**	**S**		**H**	**H**		**H**		**H**	
4	**H**		**H**	**H**	**H**		**S**	**H**		**H**		**H**	
5	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	88.0	3.0	3.0	91.8	3.0	3.0	3.0
CO2	100.0	3.0			100.0	3.0			100.0	3.0	88.0	3.0	3.0	91.8	3.0	3.0	3.0
CO3	100.0	3.0	98.0	3.0	100.0	3.0			100.0	3.0	88.0	3.0	3.0	91.8	3.0	3.0	3.0
CO4			98.0	3.0	100.0	3.0			100.0	3.0	88.0	3.0	3.0	91.8	3.0	3.0	3.0
CO5			98.0	3.0	100.0	3.0			100.0	3.0	88.0	3.0	3.0	91.8	3.0	3.0	3.0

AVERAGE	AVERAGE
3	3

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	PO5	PO6	PO7	PO8
CO1	H 3			H 3				H 3
CO2	H 3		H 3	H 3			H 3	H 3
CO3	H 3			H 3			H 3	H 3
CO4	H 3		H 3	H 3	H 3			H 3
CO5	H 3		H 3	H 3	H 3		H 3	
AVERAGE OF COS FOR POS	3		3	3	3		3	3
AVERAGE OF POS	3		3	3	3		3	3
AVERAGE	3							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: ENVIRONMENTAL STUDIES AND GENDER SENSITIZATION

COURSE CODE: ES18101

CREDITS: 3

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Understand the importance of environmental education, conservation of natural resources & understand the importance of ecosystems and biodiversity	III (APPLY)
CO2	**CO2:** Understand the pollution problems and apply the environmental science knowledge on solid waste management, disaster management	IV(ANALYZE)
CO3	**CO3:** Apply the environmental science knowledge to improve the resources Evaluate and understand the sustainable environmental conditions and control methods	III (APPLY)
CO4	**CO4:** Identify the interactions and intersections of identities (e.g., gender, race, ethnicity, class, sexuality, and so on) and assess the ways in which they contribute to instances of privilege and power dynamics across cultures, space, and time. And their problems	VI(CREATE)
CO5	**CO5:** Understand the gender problems and ways of addressing them, including interactions across local to global scales in communities and overcome inequalities with legislations	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

Course	**Programme Outcomes**	**Program Specific outcomes**

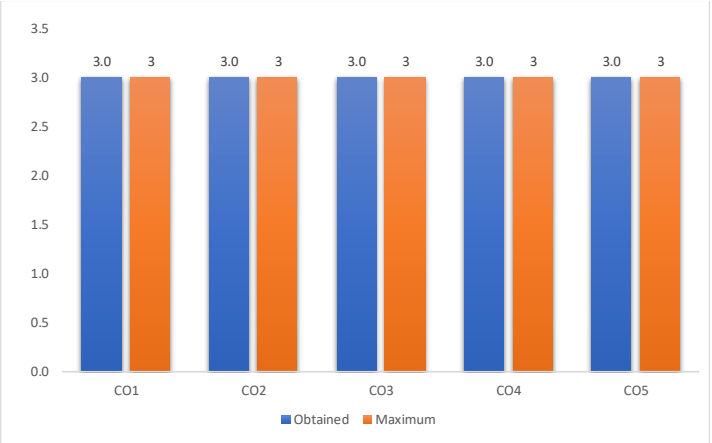
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	**H**		**H**	**S**			**S**	**S**		**S**		**H**	
2	**H**		**H**	**H**			**H**	**S**		**H**		**H**	
3	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	
4	**H**		**H**	**H**	**S**		**H**	**S**		**H**		**S**	
5	**H**		**H**	**H**	**S**		**S**	**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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	94.1	3.0	3.0	100.0	3.0	3.0	3.0
CO2	100.0	3.0			100.0	3.0			100.0	3.0	94.1	3.0	3.0	100.0	3.0	3.0	3.0
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	94.1	3.0	3.0	100.0	3.0	3.0	3.0
CO4			100.0	3.0	100.0	3.0			100.0	3.0	94.1	3.0	3.0	100.0	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	94.1	3.0	3.0	100.0	3.0	3.0	3.0

AVERAGE	AVERAGE
3	3

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	PO5	PO6	PO7	PO8
CO1	H 3		H 3					
CO2	H 3		H 3	H 3			H 3	
CO3	H 3		H 3	H 3	H 3		H 3	
CO4	H 3		H 3	H 3			H 3	
CO5	H 3		H 3	H 3				H 3
AVERAGE OF COS FOR POS	3		3	3	3		3	3
AVERAGE OF POS	3		3	3	3		3	3
AVERAGE	3							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: NUMERICAL ANALYSIS

COURSE CODE: MS18301

CREDITS: 4

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
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- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1: Categorize** the theoretical and practical aspects of the use of numerical methods	III (APPLY)
CO2	**CO2: Explain** how the common numerical methods and are used to obtain approximate solutions to intractable mathematical problems.	IV(ANALYZE)
CO3	**CO3: Develop** numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations.	III (APPLY)
CO4	**CO4: Analyse** and evaluate the accuracy of common numerical methods.	VI(CREATE)
CO5	**CO5: Select** appropriate numerical methods to apply to various types of problems in engineering and science in consideration of the mathematical operations.	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

Course	**Programme Outcomes**	**Program Specific outcomes**

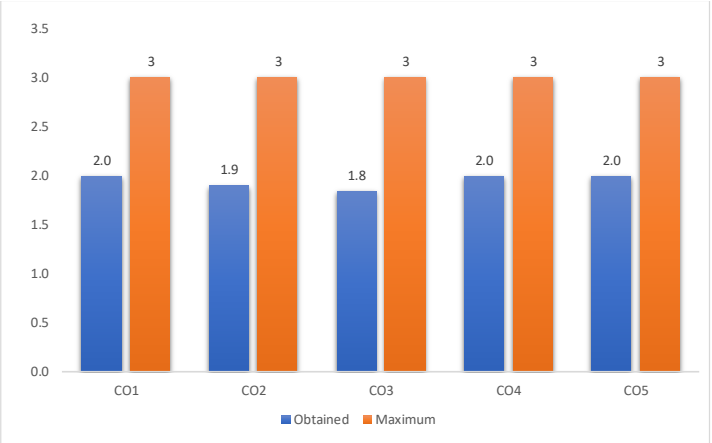
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	**H**		**H**	**S**			**S**	**S**		**S**		**H**	
2	**H**		**H**	**H**			**H**	**S**		**H**		**H**	
3	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	
4	**H**		**H**	**H**	**S**		**H**	**S**		**H**		**S**	
5	**H**		**H**	**H**	**S**		**S**	**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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	58.8	0.0			98.0	3.0	100.0	3.0	100.0	3.0	70.6	1.0	2.0	82.4	2.0	2.0	2.0
CO2	58.8	0.0			98.0	3.0			100.0	3.0	70.6	1.0	1.8	82.4	2.0	2.0	1.9
CO3	58.8	0.0	72.5	1.0	98.0	3.0			100.0	3.0	70.6	1.0	1.6	82.4	2.0	2.0	1.8
CO4			72.5	1.0	98.0	3.0			100.0	3.0	70.6	1.0	2.0	82.4	2.0	2.0	2.0
CO5			72.5	1.0	98.0	3.0			100.0	3.0	70.6	1.0	2.0	82.4	2.0	2.0	2.0

AVERAGE	AVERAGE
2	1.948

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	PO5	PO6	PO7	PO8
CO1	H 2		H 2					
CO2	H 1.9		H 1.9	H 1.9			H 1.9	
CO3	H 1.84		H 1.84	H 1.84	H 1.84		H 1.84	
CO4	H 2		H 2	H 2			H 2	
CO5	H 2		H 2	H 2				H 2
AVERAGE OF COS FOR POS	1.948		1.948	1.935	1.84		1.913333333	2
AVERAGE OF POS	1.9376		1.9376	1.935	1.84		1.913333	2
AVERAGE	1.927255556							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: ABSTRACT ALGEBRA

COURSE CODE: MS18302

CREDITS: 4

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1: Demonstrate** important mathematical concepts in abstract algebra such as definition of a group, order of a finite group and order of an element.	III (APPLY)
CO2	**CO2: Analyse** different types of subgroups such as normal subgroups, cyclic subgroups and understand the structure and characteristics of these subgroups	IV(ANALYZE)
CO3	**CO3: Solve** the algebraic problems using appropriate techniques.	III (APPLY)
CO4	**CO4: Analyse** the knowledge and understanding of fundamental concepts including groups, subgroups, normal subgroups, homomorphism and isomorphism.	VI(CREATE)
CO5	**CO5: Demonstrate** knowledge and understanding of rings, fields and their properties.	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**	

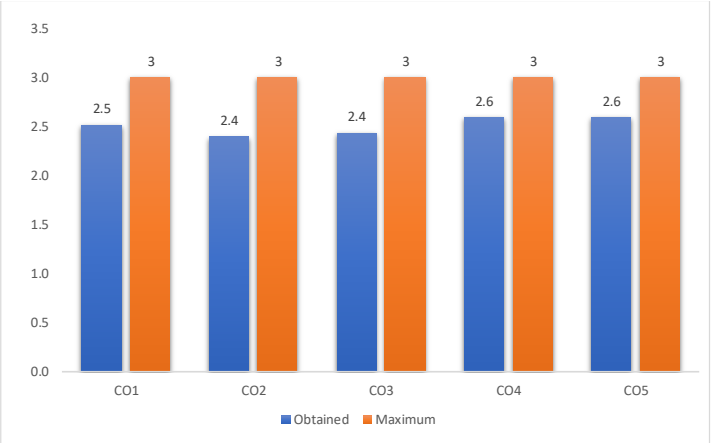
1	**H**		**H**	**S**			**S**	**S**		**S**		**H**	
2	**H**		**H**	**H**			**H**	**S**		**H**		**H**	
3	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	
4	**H**		**H**	**H**	**S**		**H**	**S**		**H**		**S**	
5	**H**		**H**	**H**	**S**		**S**	**H**		**H**		**H**	

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	47.1	0.0			98.0	3.0	100.0	3.0	100.0	3.0	60.8	0.0	1.8	94.1	3.0	3.0	2.5
CO2	47.1	0.0			98.0	3.0			100.0	3.0	60.8	0.0	1.5	94.1	3.0	3.0	2.4
CO3	47.1	0.0	82.4	2.0	98.0	3.0			100.0	3.0	60.8	0.0	1.6	94.1	3.0	3.0	2.4
CO4			82.4	2.0	98.0	3.0			100.0	3.0	60.8	0.0	2.0	94.1	3.0	3.0	2.6
CO5			82.4	2.0	98.0	3.0			100.0	3.0	60.8	0.0	2.0	94.1	3.0	3.0	2.6

AVERAGE	AVERAGE
3	2.512

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	PO5	PO6	PO7	PO8
CO1	H 2.52		H 2.52					
CO2	H 2.4		H 2.4	H 2.4			H 2.4	
CO3	H 2.44		H 2.44	H 2.44	H 2.44		H 2.44	
CO4	H 2.6		H 2.6	H 2.6			H 2.6	
CO5	H 2.6		H 2.6	H 2.6				H 2.6
AVERAGE OF COS FOR POS	2.512		2.512	2.51	2.44		2.48	2.6
AVERAGE OF POS	2.5104		2.5104	2.51	2.44		2.48	2.6
AVERAGE	2.508466667							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: STATISTICAL METHOD

COURSE CODE: BS20038

CREDITS: 4

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1: Calculate** and interpret the correlation between two variables	III (APPLY)
CO2	**CO2: Produces** simple linear regression equations	IV(ANALYZE)
CO3	**CO3: Analyze** the categorical data and to study the association among them.	III (APPLY)
CO4	**CO4: Understand** problem of point estimation.	VI(CREATE)
CO5	**CO5: Obtain** estimators using estimation methods like MLE and method of moments.	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**	

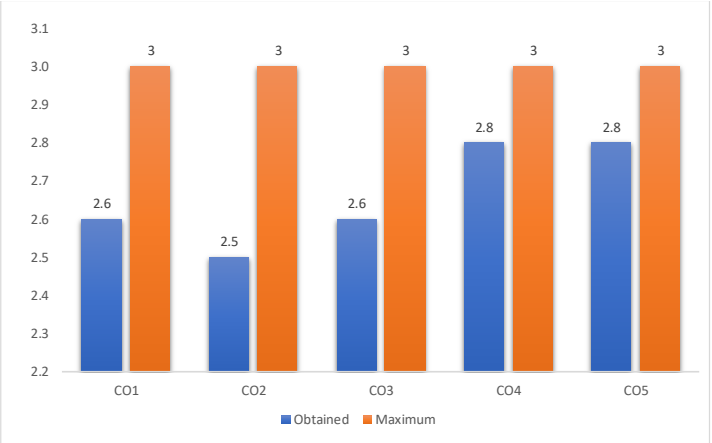
1	**H**		**H**	**S**			**S**	**S**		**S**		**H**	
2	**H**		**H**	**H**			**H**	**S**		**H**		**H**	
3	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	
4	**H**		**H**	**H**	**S**		**H**	**S**		**H**		**S**	
5	**H**		**H**	**H**	**S**		**S**	**H**		**H**		**H**	

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	60.8	0.0			100.0	3.0	100.0	3.0	100.0	3.0	68.6	1.0	2.0	90.2	3.0	3.0	2.6
CO2	60.8	0.0			100.0	3.0			100.0	3.0	68.6	1.0	1.8	90.2	3.0	3.0	2.5
CO3	60.8	0.0	92.2	3.0	100.0	3.0			100.0	3.0	68.6	1.0	2.0	90.2	3.0	3.0	2.6
CO4			92.2	3.0	100.0	3.0			100.0	3.0	68.6	1.0	2.5	90.2	3.0	3.0	2.8
CO5			92.2	3.0	100.0	3.0			100.0	3.0	68.6	1.0	2.5	90.2	3.0	3.0	2.8

AVERAGE	AVERAGE
3	2.66

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	PO5	PO6	PO7	PO8
CO1	H 2.6		H 2.6					
CO2	H 2.5		H 2.5	H 2.5			H 2.5	
CO3	H 2.6		H 2.6	H 2.6	H 2.6		H 2.6	
CO4	H 2.8		H 2.8	H 2.8			H 2.8	
CO5	H 2.8		H 2.8	H 2.8				H 2.8
AVERAGE OF COS FOR POS	2.66		2.66	2.675	2.6		2.633333333	2.8
AVERAGE OF POS	2.672		2.672	2.675	2.6		2.633333	2.8
AVERAGE	2.675388889							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: OPERATING SYSTEM

COURSE CODE: MS20303

CREDITS: 4

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Describe, contrast and compare differing structures for operating systems.	III (APPLY)
CO2	**CO2: Understand** and analyze theory and implementation of processes.	IV(ANALYZE)
CO3	**CO3:** Understand what deadlock is and how it can occur when giving mutually exclusive access to multiple resources	III (APPLY)
CO4	**CO4:** Understand the concept of file system interface.	VI(CREATE)
CO5	**CO5:** Define segmentation of Memory management in an Operating System	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**	

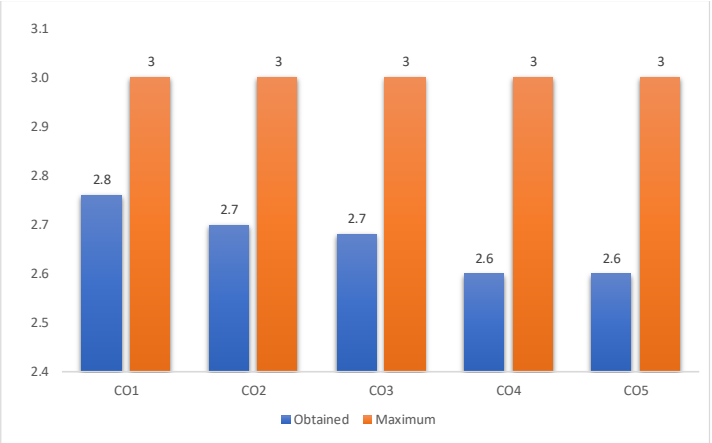
1	**H**		**H**	**S**			**S**	**S**		**S**		**H**	
2	**H**		**H**	**H**			**H**	**S**		**H**		**H**	
3	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	
4	**H**		**H**	**H**	**S**		**H**	**S**		**H**		**S**	
5	**H**		**H**	**H**	**S**		**S**	**H**		**H**		**H**	

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	86.3	3.0			100.0	3.0	100.0	3.0	100.0	3.0	54.9	0.0	2.4	92.2	3.0	3.0	2.8
CO2	86.3	3.0			100.0	3.0			100.0	3.0	54.9	0.0	2.3	92.2	3.0	3.0	2.7
CO3	86.3	3.0	84.3	2.0	100.0	3.0			100.0	3.0	54.9	0.0	2.2	92.2	3.0	3.0	2.7
CO4			84.3	2.0	100.0	3.0			100.0	3.0	54.9	0.0	2.0	92.2	3.0	3.0	2.6
CO5			84.3	2.0	100.0	3.0			100.0	3.0	54.9	0.0	2.0	92.2	3.0	3.0	2.6

AVERAGE	AVERAGE
3	2.668

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	PO5	PO6	PO7	PO8
CO1	H 2.76		H 2.76					
CO2	H 2.7		H 2.7	H 2.7			H 2.7	
CO3	H 2.68		H 2.68	H 2.68	H 2.68		H 2.68	
CO4	H 2.6		H 2.6	H 2.6			H 2.6	
CO5	H 2.6		H 2.6	H 2.6				H 2.6
AVERAGE OF COS FOR POS	2.668		2.668	2.645	2.68		2.66	2.6
AVERAGE OF POS	2.6496		2.6496	2.645	2.68		2.66	2.6
AVERAGE	2.647366667							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: DISCRETE MATHEMATICS

COURSE CODE: MS18501A

CREDITS: 4

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1: Develop** understanding of Logic Sets and Functions	III (APPLY)
CO2	**CO2: Understand** Boolean algebra and basic properties of Boolean algebra; able to simplify simple Boolean functions by using the basic Boolean properties.	IV(ANALYZE)
CO3	**CO3: Develop** an understanding of how graph and tree concepts are used to solve problems arising in the computer science.	III (APPLY)
CO4	**CO4: Evaluate** and apply the fundamental concepts in graph theory	VI(CREATE)
CO5	**CO5: Apply** graph theory based tools in solving practical problems.	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**	

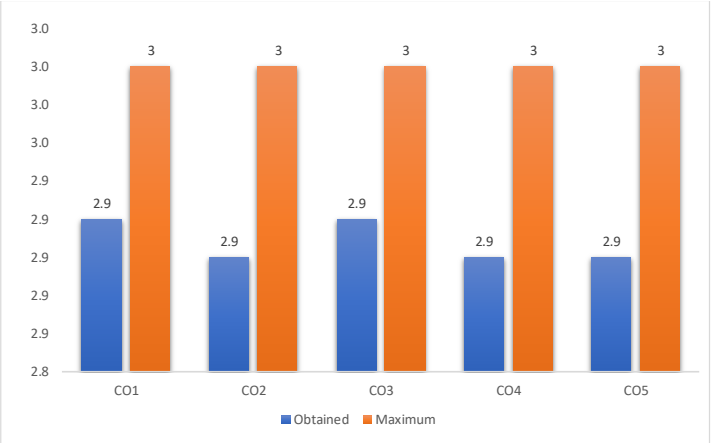
1	**H**		**H**	**S**			**S**	**S**		**S**		**H**	
2	**H**		**H**	**H**			**H**	**S**		**H**		**H**	
3	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	
4	**H**		**H**	**H**	**S**		**H**	**S**		**H**		**S**	
5	**H**		**H**	**H**	**S**		**S**	**H**		**H**		**H**	

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	76.9	2.0	2.8	100.0	3.0	3.0	2.9
CO2	100.0	3.0			100.0	3.0			100.0	3.0	76.9	2.0	2.8	100.0	3.0	3.0	2.9
CO3	100.0	3.0	96.2	3.0	100.0	3.0			100.0	3.0	76.9	2.0	2.8	100.0	3.0	3.0	2.9
CO4			96.2	3.0	100.0	3.0			100.0	3.0	76.9	2.0	2.8	100.0	3.0	3.0	2.9
CO5			96.2	3.0	100.0	3.0			100.0	3.0	76.9	2.0	2.8	100.0	3.0	3.0	2.9

AVERAGE	AVERAGE
3	2.908

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	PO5	PO6	PO7	PO8
CO1	H 2.92		H 2.92					
CO2	H 2.9		H 2.9	H 2.9			H 2.9	
CO3	H 2.92		H 2.92	H 2.92	H 2.92		H 2.92	
CO4	H 2.9		H 2.9	H 2.9			H 2.9	
CO5	H 2.9		H 2.9	H 2.9				H 2.9
AVERAGE OF COS FOR POS	2.908		2.908	2.905	2.92		2.906666667	2.9
AVERAGE OF POS	2.9056		2.9056	2.905	2.92		2.906667	2.9
AVERAGE	2.907144444							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: ELEMENTARY NUMBER THEORY

COURSE CODE: MS18501B

CREDITS: 4

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1: Express** the concepts and results of Number Theory.	III (APPLY)
CO2	**CO2: Demonstrate** knowledge and understanding of topics including, divisibility, prime numbers, congruences, Diophantine equations	IV(ANALYZE)
CO3	**CO3: Identify** methods and techniques used in number theory.	III (APPLY)
CO4	**CO4: Solve** challenging problems in Number Theory.	VI(CREATE)
CO5	**CO5: Develop** a deeper conceptual understanding of the theoretical basis of number theory and cryptography.	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**	

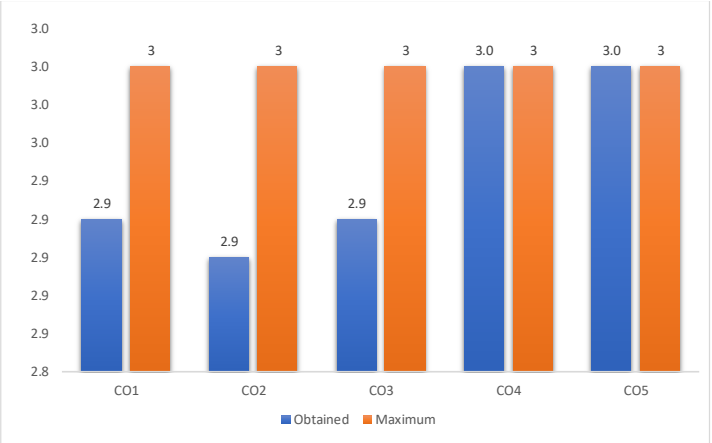
1	**H**		**H**	**S**			**S**	**S**		**S**		**H**	
2	**H**		**H**	**H**			**H**	**S**		**H**		**H**	
3	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	
4	**H**		**H**	**H**	**S**		**H**	**S**		**H**		**S**	
5	**H**		**H**	**H**	**S**		**S**	**H**		**H**		**H**	

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	81.8	2.0			100.0	3.0	100.0	3.0	100.0	3.0	90.9	3.0	2.8	100.0	3.0	3.0	2.9
CO2	81.8	2.0			100.0	3.0			100.0	3.0	90.9	3.0	2.8	100.0	3.0	3.0	2.9
CO3	81.8	2.0	86.4	3.0	100.0	3.0			100.0	3.0	90.9	3.0	2.8	100.0	3.0	3.0	2.9
CO4			86.4	3.0	100.0	3.0			100.0	3.0	90.9	3.0	3.0	100.0	3.0	3.0	3.0
CO5			86.4	3.0	100.0	3.0			100.0	3.0	90.9	3.0	3.0	100.0	3.0	3.0	3.0

AVERAGE	AVERAGE
3	2.948

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	PO5	PO6	PO7	PO8
CO1	H 2.92		H 2.92					
CO2	H 2.9		H 2.9	H 2.9			H 2.9	
CO3	H 2.92		H 2.92	H 2.92	H 2.92		H 2.92	
CO4	H 3		H 3	H 3			H 3	
CO5	H 3		H 3	H 3				H 3
AVERAGE OF COS FOR POS	2.948		2.948	2.955	2.92		2.94	3
AVERAGE OF POS	2.9536		2.9536	2.955	2.92		2.94	3
AVERAGE	2.9537							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: STATISTICAL QUALITY CONTROL AND RELIABILITY

COURSE CODE: MS21502A

CREDITS: 3

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1: Analyze** the concepts of quality control, chance and assignable causes of variation, control charts for variables and attribute.	III (APPLY)
CO2	**CO2: Classify tolerance** limits, specification limits and process capability limits..	IV(ANALYZE)
CO3	**CO3:** To understand the concepts of process capability and tolerance limits in SQC	III (APPLY)
CO4	**CO4:** To apply single and double sampling plans and to assess the risks	VI(CREATE)
CO5	**CO5: Analyze** statistical experiments leading to reliability modelling.	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**	

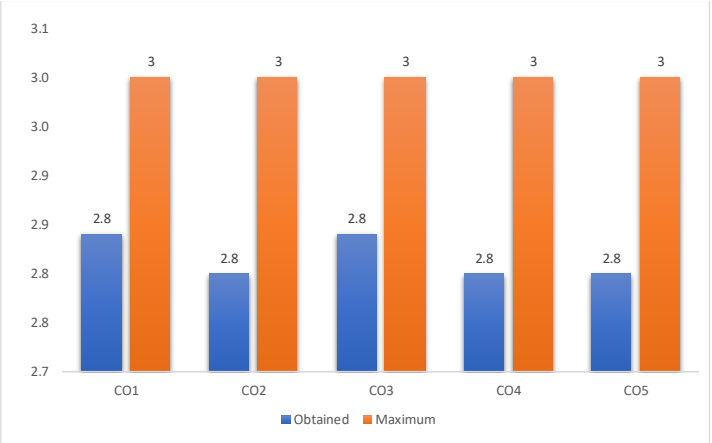
1	**H**		**H**	**S**			**S**	**S**		**S**		**H**	
2	**H**		**H**	**H**			**H**	**S**		**H**		**H**	
3	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	
4	**H**		**H**	**H**	**S**		**H**	**S**		**H**		**S**	
5	**H**		**H**	**H**	**S**		**S**	**H**		**H**		**H**	

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	100.0	3.0			95.7	3.0	95.7	3.0	95.7	3.0	69.6	1.0	2.6	91.3	3.0	3.0	2.8
CO2	100.0	3.0			95.7	3.0			95.7	3.0	69.6	1.0	2.5	91.3	3.0	3.0	2.8
CO3	100.0	3.0	100.0	3.0	95.7	3.0			95.7	3.0	69.6	1.0	2.6	91.3	3.0	3.0	2.8
CO4			100.0	3.0	95.7	3.0			95.7	3.0	69.6	1.0	2.5	91.3	3.0	3.0	2.8
CO5			100.0	3.0	95.7	3.0			95.7	3.0	69.6	1.0	2.5	91.3	3.0	3.0	2.8

AVERAGE	AVERAGE
3	2.816

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	PO5	PO6	PO7	PO8
CO1	H 2.84		H 2.84					
CO2	H 2.8		H 2.8	H 2.8			H 2.8	
CO3	H 2.84		H 2.84	H 2.84	H 2.84		H 2.84	
CO4	H 2.8		H 2.8	H 2.8			H 2.8	
CO5	H 2.8		H 2.8	H 2.8				H 2.8
AVERAGE OF COS FOR POS	2.816		2.816	2.81	2.84		2.813333333	2.8
AVERAGE OF POS	2.8112		2.8112	2.81	2.84		2.813333	2.8
AVERAGE	2.814288889							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: STATISTICAL TECHNIQUES IN DATA WAREHOUSING AND DATA MINING

COURSE CODE: MS21502B

CREDITS: 3

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1: To** Understand Data Warehousing fundamentals, Data Mining Principles	III (APPLY)
CO2	**CO2:** To Compare Data Mining and KDD process	IV(ANALYZE)
CO3	**CO3:** To Compare and evaluate different data mining techniques like clustering and association rule mining.	III (APPLY)
CO4	**CO4:** To Demonstrate classification, k-nearest neighbourhood techniques used in making better decisions	VI(CREATE)
CO5	**CO5:** To design data warehouse with dimensional modelling and apply OLAP and OLTP operations.	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**	

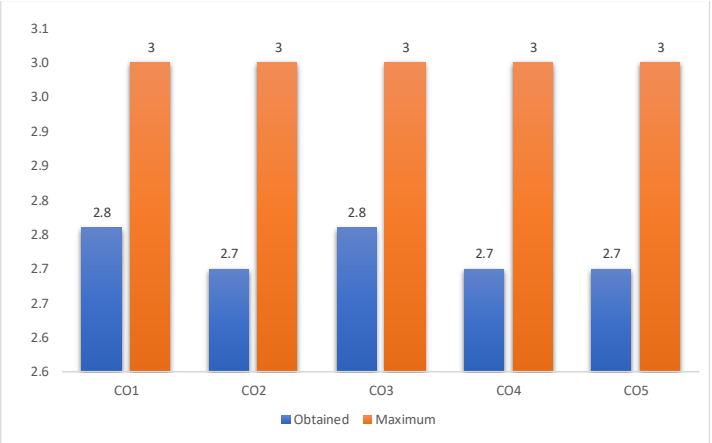
1	**H**		**H**	**S**			**S**	**S**		**S**		**H**	
2	**H**		**H**	**H**			**H**	**S**		**H**		**H**	
3	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	
4	**H**		**H**	**H**	**S**		**H**	**S**		**H**		**S**	
5	**H**		**H**	**H**	**S**		**S**	**H**		**H**		**H**	

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	56.0	0.0	2.4	96.0	3.0	3.0	2.8
CO2	100.0	3.0			100.0	3.0			100.0	3.0	56.0	0.0	2.3	96.0	3.0	3.0	2.7
CO3	100.0	3.0	96.0	3.0	100.0	3.0			100.0	3.0	56.0	0.0	2.4	96.0	3.0	3.0	2.8
CO4			96.0	3.0	100.0	3.0			100.0	3.0	56.0	0.0	2.3	96.0	3.0	3.0	2.7
CO5			96.0	3.0	100.0	3.0			100.0	3.0	56.0	0.0	2.3	96.0	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	PO5	PO6	PO7	PO8
CO1	H 2.76		H 2.76					
CO2	H 2.7		H 2.7	H 2.7			H 2.7	
CO3	H 2.76		H 2.76	H 2.76	H 2.76		H 2.76	
CO4	H 2.7		H 2.7	H 2.7			H 2.7	
CO5	H 2.7		H 2.7	H 2.7				H 2.7
AVERAGE OF COS FOR POS	2.724		2.724	2.715	2.76		2.72	2.7
AVERAGE OF POS	2.7168		2.7168	2.715	2.76		2.72	2.7
AVERAGE	2.721433333							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: LINEAR ALGEBRA

COURSE CODE: MS18504

CREDITS: 4

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1: Construct** mathematical arguments that relate to the study of introductory linear algebra.	III (APPLY)
CO2	**CO2: Solve** the characteristic polynomial, eigenvectors, eigenvalues.	IV(ANALYZE)
CO3	**CO3: Analyze** finite and infinite dimensional vector spaces and subspaces over a field and their properties, including the basis structure of vector spaces	III (APPLY)
CO4	**CO4: Use** the definition and properties of linear transformations and matrices of linear transformations and change of basis, including kernel, range and isomorphism.	VI(CREATE)
CO5	**CO5: Explain** orthogonality on vector spaces and compute inner products and, including Gram-Schmidt orthogonalization	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**	

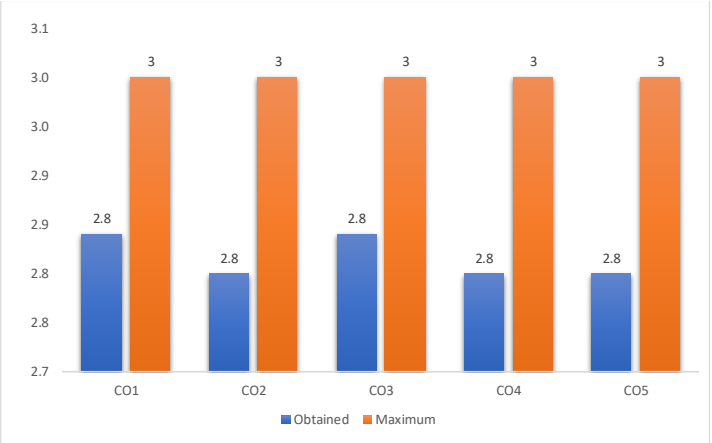
1	**H**		**H**	**S**			**S**	**S**		**S**		**H**	
2	**H**		**H**	**H**			**H**	**S**		**H**		**H**	
3	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	
4	**H**		**H**	**H**	**S**		**H**	**S**		**H**		**S**	
5	**H**		**H**	**H**	**S**		**S**	**H**		**H**		**H**	

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	66.7	1.0	2.6	#REF!	3.0	3.0	2.8
CO2	100.0	3.0			100.0	3.0			100.0	3.0	66.7	1.0	2.5	100.0	3.0	3.0	2.8
CO3	100.0	3.0	97.9	3.0	100.0	3.0			100.0	3.0	66.7	1.0	2.6	100.0	3.0	3.0	2.8
CO4			97.9	3.0	100.0	3.0			100.0	3.0	66.7	1.0	2.5	100.0	3.0	3.0	2.8
CO5			97.9	3.0	100.0	3.0			100.0	3.0	66.7	1.0	2.5	100.0	3.0	3.0	2.8

AVERAGE	AVERAGE
3	2.816

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	PO5	PO6	PO7	PO8
CO1	H 2.84		H 2.84					
CO2	H 2.8		H 2.8	H 2.8			H 2.8	
CO3	H 2.84		H 2.84	H 2.84	H 2.84		H 2.84	
CO4	H 2.8		H 2.8	H 2.8			H 2.8	
CO5	H 2.8		H 2.8	H 2.8				H 2.8
AVERAGE OF COS FOR POS	2.816		2.816	2.81	2.84		2.813333333	2.8
AVERAGE OF POS	2.8112		2.8112	2.81	2.84		2.813333	2.8
AVERAGE	2.814288889							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: SAMPLING THEORY,TIME SERIES,INDEX NUMBERS AND DEMAND ANALYSIS

COURSE CODE: MS21503

CREDITS: 4

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** To design and implement surveys with the simple random sampling technique	III (APPLY)
CO2	**CO2:** To estimate sample size for different sampling designs like systematic and stratified sampling to estimate population parameters	IV(ANALYZE)
CO3	**CO3:** To use special statistical methods to reveal hidden patterns of the data within each organization	III (APPLY)
CO4	**CO4:** To understand the concepts of cost, nature of production and its relationship of business operations	VI(CREATE)
CO5	**CO5:** To interpret indexes to identify trends in a data set and use the consumer price index to determine the purchasing power of the dollar and to compute real income	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**	

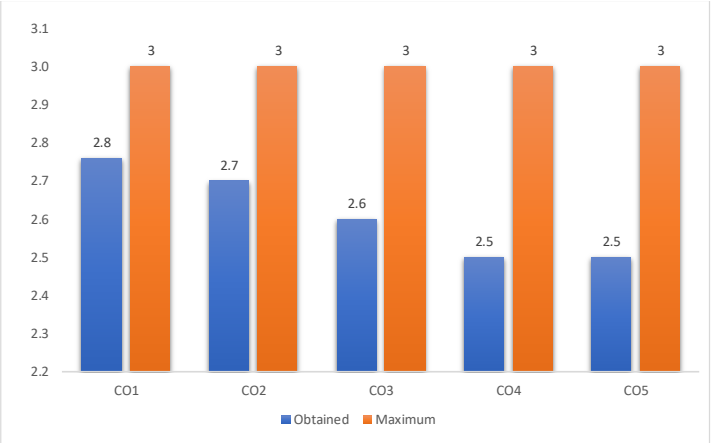
1	**H**		**H**	**S**			**S**	**S**		**S**		**H**	
2	**H**		**H**	**H**			**H**	**S**		**H**		**H**	
3	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	
4	**H**		**H**	**H**	**S**		**H**	**S**		**H**		**S**	
5	**H**		**H**	**H**	**S**		**S**	**H**		**H**		**H**	

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	91.7	3.0			100.0	3.0	100.0	3.0	100.0	3.0	45.8	0.0	2.4	100.0	3.0	3.0	2.8
CO2	91.7	3.0			100.0	3.0			100.0	3.0	45.8	0.0	2.3	100.0	3.0	3.0	2.7
CO3	91.7	3.0	70.8	1.0	100.0	3.0			100.0	3.0	45.8	0.0	2.0	100.0	3.0	3.0	2.6
CO4			70.8	1.0	100.0	3.0			100.0	3.0	45.8	0.0	1.8	100.0	3.0	3.0	2.5
CO5			70.8	1.0	100.0	3.0			100.0	3.0	45.8	0.0	1.8	100.0	3.0	3.0	2.5

AVERAGE	AVERAGE
3	2.612

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	PO5	PO6	PO7	PO8
CO1	H 2.76		H 2.76					
CO2	H 2.7		H 2.7	H 2.7			H 2.7	
CO3	H 2.6		H 2.6	H 2.6	H 2.6		H 2.6	
CO4	H 2.5		H 2.5	H 2.5			H 2.5	
CO5	H 2.5		H 2.5	H 2.5				H 2.5
AVERAGE OF COS FOR POS	2.612		2.612	2.575	2.6		2.6	2.5
AVERAGE OF POS	2.5824		2.5824	2.575	2.6		2.6	2.5
AVERAGE	2.5733							

COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: JAVA PROGRAMMING

COURSE CODE: MS18506

CREDITS: 4

DEPARTMENT: B. Sc. MATHEMATICS, STATISTICS & COMPUTER SCIENCE

Programme Outcomes – (B. Sc.)

B. Sc.:

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

PSO1. Demonstrate in-depth knowledge in the foundational areas of the mathematical sciences and Communicate mathematical ideas using numerical, graphical and symbolic representations.

PSO2. Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

PSO3. Use emerging technologies and computing concepts.

PSO4. Apply mathematical, computational and statistical tools to detect patterns and model performance.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Understand and identify basic computer network topologies and protocols and explain Data Communication System components and Functions of each layer in OSI model and its protocols.	III (APPLY)
CO2	**CO2:** Classify different error detecting techniques	IV(ANALYZE)
CO3	**CO3:** Create skills of sub-netting and routing mechanisms	III (APPLY)
CO4	**CO4:** Identify different internetworking devices	VI(CREATE)
CO5	**CO5:** Compare different OSI upper layes	IV(ANALYZE)

Table 1: CO, PO, PSO MAPPING

Course	Programme Outcomes	Program Specific outcomes

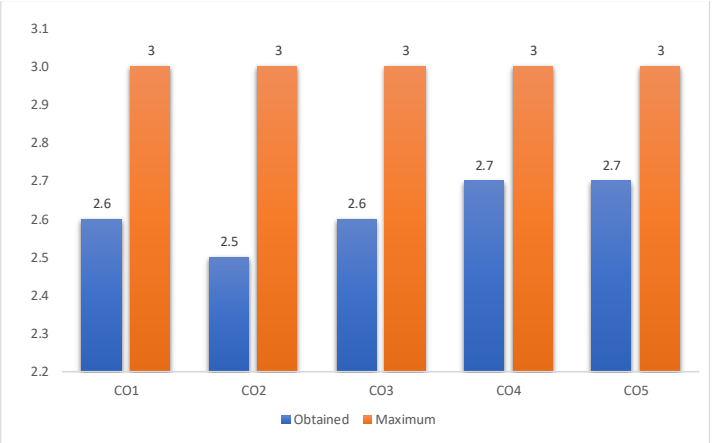
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	**H**		**H**	**S**			**S**	**S**		**S**		**H**	
2	**H**		**H**	**H**			**H**	**S**		**H**		**H**	
3	**H**		**H**	**H**	**H**		**H**	**S**		**H**		**H**	
4	**H**		**H**	**H**	**S**		**H**	**S**		**H**		**S**	
5	**H**		**H**	**H**	**S**		**S**	**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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	70.8	1.0			100.0	3.0	100.0	3.0	100.0	3.0	64.6	0.0	2.0	100.0	3.0	3.0	2.6
CO2	70.8	1.0			100.0	3.0			100.0	3.0	64.6	0.0	1.8	100.0	3.0	3.0	2.5
CO3	70.8	1.0	93.8	3.0	100.0	3.0			100.0	3.0	64.6	0.0	2.0	100.0	3.0	3.0	2.6
CO4			93.8	3.0	100.0	3.0			100.0	3.0	64.6	0.0	2.3	100.0	3.0	3.0	2.7
CO5			93.8	3.0	100.0	3.0			100.0	3.0	64.6	0.0	2.3	100.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.62

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	PO5	PO6	PO7	PO8
CO1	H 2.6		H 2.6					
CO2	H 2.5		H 2.5	H 2.5			H 2.5	
CO3	H 2.6		H 2.6	H 2.6	H 2.6		H 2.6	
CO4	H 2.7		H 2.7	H 2.7			H 2.7	
CO5	H 2.7		H 2.7	H 2.7				H 2.7
AVERAGE OF COS FOR POS	2.62		2.62	2.625	2.6		2.6	2.7
AVERAGE OF POS	2.624		2.624	2.625	2.6		2.6	2.7
AVERAGE	2.628833333							