DEPARTMENT OF B.SC. COMPUTER SCIENCE AND ENGINEERING

CO PO MAPPING FOR THE ACADEMIC YEAR 2023-24

FIRST YEAR - I SEM

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: General English-I
CREDITS: 3
COURSE CODE: EN18101

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

Programme Outcomes – (B. Sc. Computer Science and Engineering)

- **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:** Recognize the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

- **PSO1:** Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real-world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.

- **PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**To distinguish** between words which are either spelt or pronounced alike, yet render distinct meanings; imparting a sound clarity on everyday usage of language and for developing the art of parallel listening and writing.	II (ANALYZE)
CO2	**To construct** vocabulary and to gain understanding on the tense component, a pivotal constituent for language structuring and vocabulary building**.**	VI(CREATE)
CO3	To **identify** with economical word constructions, paying specific attention in constructing sound writing skills.	III (APPLY)
CO4	To **interpret** functional grammar, the basic part involved in sentence constructing to improve linguistic skills.	V(EVALUATE)
CO5	**To develop** communication skills to provide a platform for language efficiency for effective language delivery.	VI(CREATE)

Table 1: CO, PO, PSO MAPPING

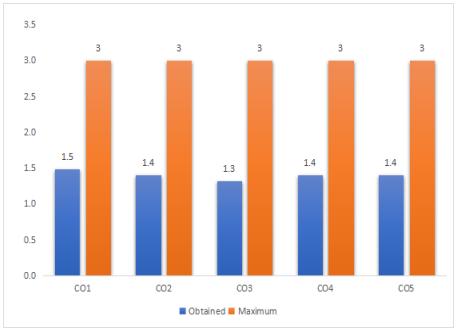
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H		S	H					H	S		
C02		H		H					H			S
C03		S	H						H		H	
C04	H	H	H						S		H	
C05	H	H	H							H		

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	74.5	1.0			96.4	3.0	100.0	3.0	100.0	3.0	72.7	1.0	2.2	74.5	1.0	1.0	1.5
CO2	74.5	1.0			96.4	3.0			100.0	3.0	72.7	1.0	2.0	74.5	1.0	1.0	1.4
CO3	74.5	1.0	70.9	1.0	96.4	3.0			100.0	3.0	72.7	1.0	1.8	74.5	1.0	1.0	1.3
CO4			70.9	1.0	96.4	3.0			100.0	3.0	72.7	1.0	2.0	74.5	1.0	1.0	1.4
CO5			70.9	1.0	96.4	3.0			100.0	3.0	72.7	1.0	2.0	74.5	1.0	1.0	1.4

AVERAGE	AVERAGE
1	1.4

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				
CO3			H 3					
CO4	H 3	H 3	H 3					
CO5	H 3	H 3	H 3					
AVERAGE OF COS FOR POS		3	3	3				
AVERAGE OF POS	3	3	3	3				
AVERAGE	3							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: VALUE EDUCATION & PERSONALITY DEVELOPMENT
COURSE CODE: VE18101
CREDITS: 2

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

PROGRAMME OUTCOMES Or POs :B. Sc . Computer Science & Engineering

PO1: Scientific knowledge: Apply the knowledge of science, mathematics, engineering and 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 analyse 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 and 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: Communication effectively on complex science and technology activities with society at large and able to write effective reports and documentation.
PO8: Life-long learning: Recognize the need and ability to engage in independent and life-long learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE) or PSOs:
B.Sc. Computer Science Engineering.
PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	**BLOOM'S TAXONOMY LEVEL**
CO1	To **identify** a sound understanding on the formation of words and to demonstrate the functional grammatical component in the sentence.	III(APPLY)
CO2	To **paraphrase** ideas and thoughts in a coherent, neat and organized manner in order to utilize the writing skills for sound writing propagandas.	IV(ANALYZING)

CO3	To **create** an understanding on Indian Literature, alongside to develop and chisel their communication skills.	VI(CREATE)
CO4	To **recognize** the moral element which underlies in the short story; an exposure to informal language.	I(REMEMBER)
CO5	To **develop** listening and speaking skills through effective sentence constructions and efficient delivery .	VI(CREATE)

Table 1: CO, PO, PSO MAPPING

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

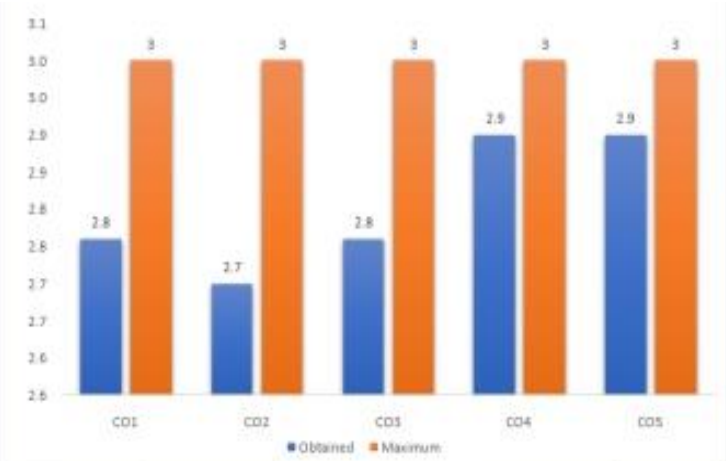
H: Highly Supportive **S: Supportive**

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 average	pass%	Attainment level	co wise external average	co wise total average
[illegible]	67.3	1.0			100.0	3.0	100.0	3.0	94.5	3.0	81.8	2.0	2.4	96.4	3.0	3.0	2.8
[illegible]	67.3	1.0			100.0	3.0			94.5	3.0	81.8	2.0	2.3	96.4	3.0	3.0	2.7
[illegible]	67.3	1.0	98.2	3.0	100.0	3.0			94.5	3.0	81.8	2.0	2.4	96.4	3.0	3.0	2.8
[illegible]			98.2	3.0	100.0	3.0			94.5	3.0	81.8	2.0	2.8	96.4	3.0	3.0	2.9
[illegible]			98.2	3.0	100.0	3.0			94.5	3.0	81.8	2.0	2.8	96.4	3.0	3.0	2.9

AVERAGE	AVERAGE
3	2.804

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

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 3			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							
CO5	H 3		H 3	H 3		H 3		
AVERAGE OF COS FORPOS	3	3	3	3	3	3	3	3
AVERAGE OF POS	3	3	3	3	3	3	3	3
AVERAGE	3							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: ENGINEERING PHYSICS
COURSE CODE:BS19121
CREDITS: 4

DEPARTMENT: B.Sc. COMPUTER SCIENCE AND ENGINEERING

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs : B.Sc. Computer Science & Engineering

- **PO1: Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complexproblems**.**
- **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 conclusionsusing 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 effectivereports 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 OUTCOME (DEPARTMENT WISE):

- **PSO1**: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real-world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Apply** Fundamental electromagnetic concepts for various applications including wireless and optical communications.	II (ANALYZE)
CO2	**Design** different applications of lasers and fibre optics in the field of industry, medical and telecommunications	VI(CREATE)
CO3	**Distinguish** the various crystalline materials and to understand the crystallographic techniques.	III (APPLY)
CO4	**Apply** concepts of wave and particle nature of material particles for various engineering applications	V(EVALUATE)
CO5	**Develop** different devices with more efficiency using superconducting and nano materials.	VI(CREATE)

TABLE 1: CO, PO, PSO MAPPING

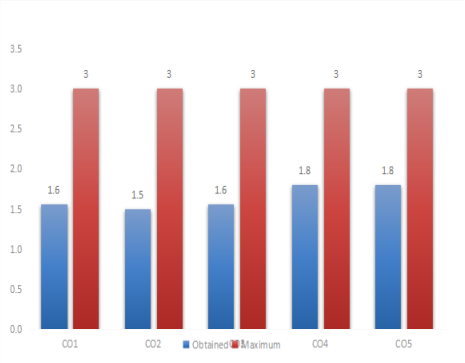
Course outcomes	Programme Outcomes								Program Specific outcomes			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4
1	H		H					H	S			
2	H			H					S			
3	H							H	S			
4	H							H	S			
5	H			H					S			

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	46.3	0.0			98.1	3.0	100.0	3.0	100.0	3.0	92.6	3.0	2.4	68.5	1.0	1.0	1.6
CO2	46.3	0.0			98.1	3.0			100.0	3.0	92.6	3.0	2.3	68.5	1.0	1.0	1.5
CO3	46.3	0.0	100.0	3.0	98.1	3.0			100.0	3.0	92.6	3.0	2.4	68.5	1.0	1.0	1.6
CO4			100.0	3.0	98.1	3.0			100.0	3.0	92.6	3.0	3.0	68.5	1.0	1.0	1.8
CO5			100.0	3.0	98.1	3.0			100.0	3.0	92.6	3.0	3.0	68.5	1.0	1.0	1.8

AVERAGE	AVERAGE
1	1.644

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 examare 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	2.76		H 2.76					H 2.76
CO2	2.7			H 2.7				
CO3	2.76							H 2.76
CO4	3							H 3
CO5	3			H 3				
AVERAGE OF COS FOR POS	2.844		2.76	2.85				2.84
AVERAGE OF POS	2.8608		2.76	2.85				2.866667
AVERAGE	2.834366667							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: MATHEMATICS -I
COURSE CODE: BS19101
CREDITS: 5

DEPARTMENT: B.Sc. Computer Science & Engineering

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs : B.Sc. Computer Science & Engineering

PO1: Scientific knowledge: Apply the knowledge of science, mathematics, engineering and 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 analyse 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 and 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 andfor sustainable development,

PO6: Individual and team work: function objectively as an individual and as a member in diverse teams.

PO7: Communication: Communication effectively on complex science and technology activities with society at large and able to write effective reports and documentation.

PO8: Life-long learning: Recognize the need and ability to engage in independent and life-long learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE) or PSOs:

B.Sc. Computer Science Engineering.

PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the realworld problems.

PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts ofcomputer science and apply the knowledge in designing and building software solutions.

PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining ofvarying complexity.

PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	**BLOOM'S TAXONOMYLEVEL**
CO1	**CO 1:** To identify a sound understanding on the formation of words and to demonstrate the functional grammatical component in the sentence.	(analyze)
CO2	**CO 2:** To paraphrase ideas and thoughts in a coherent, neat and organized manner in order to utilize the writing skills for sound writing propagandas.	(understand)
CO3	**CO3**: To create an understanding on Indian Literature, alongside to develop and chisel their communication skills.	(create)
CO4	**CO4:** To recognize the moral element which underlies in the short story; an exposure to informal language.	I knowledge)
CO5	**CO5**: To develop listening and speaking skills through effective sentence constructions and efficient delivery .	(create)

Table 1:CO, PO,PSO

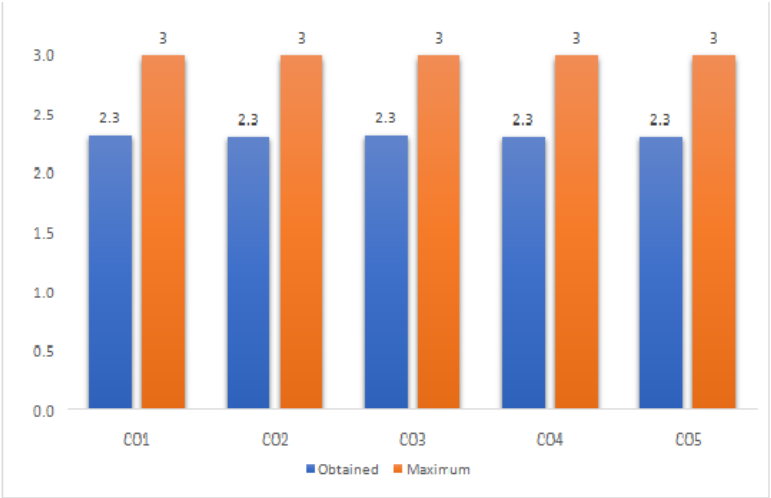
Course	Programme Outcomes								Program Specificoutcomes			
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4
1	H			H			H	S		H	H	
2		H				H		H	H		H	
3	H		H		H	H		H		H		S
4	H	S										H
5	H		H	H	S	H				H	S	

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 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	82.0	2.0	2.8	89.0	2.0	2.0	2.3
CO2	100.0	3.0			100.0	3.0			100.0	3.0	82.0	2.0	2.8	89.0	2.0	2.0	2.3
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	82.0	2.0	2.8	89.0	2.0	2.0	2.3
CO4			100.0	3.0	100.0	3.0			100.0	3.0	82.0	2.0	2.8	89.0	2.0	2.0	2.3
CO5			100.0	3.0	100.0	3.0			100.0	3.0	82.0	2.0	2.8	76.0	2.0	2.0	2.3

AVERAGE	AVERAGE
3	2.308

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

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO 1	H 1.8			H 1.8			H 1.8	
CO 2		H 1.8				1.8		H 1.8
CO 3	H 1.8		H 1.8		1.8	1.8		H 1.8
CO 4	H 1.8							
CO 5	H 1.8		H 1.8	H 1.8		1.8		
AVERAGE OF COS FORPOS	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
AVERAGE OF POS	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
AVERAGE	1.8							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: ELECTRONIC DEVICES AND CIRCUITS
COURSE CODE: CS22102
CREDITS: 4

DEPARTMENT: B. SC. COMPUTER SCIENCE & ENGINEERING

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs : B.Sc. Computer Science & Engineering

PO1: Scientific knowledge: Apply the knowledge of science, mathematics, engineering and 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 analyse 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 and 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: Communication effectively on complex science and technology activities with society at large and able to write effective reports and documentation.
PO8: Life-long learning: Recognize the need and ability to engage in independent and life-long learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE) or PSOs:
B.Sc. Computer Science Engineering.
PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.

PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.

PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Explain** the various voltages across and current flow through electronic devices in various configurations, junction with varying doping concentrations.	(II) Understand
CO2	**Design** and construct amplifier and oscillator circuits and differentiate between them	(VI) Create
CO3	**Design** and construct a DC power supply	(VI) Create
CO4	Analyze various factors influencing a transistor.	(IV) Analyze
CO5	Analyze the characteristics of amplifiers, timers and oscillators	(IV) Analyze

Table 1: CO, PO, PSO MAPPING

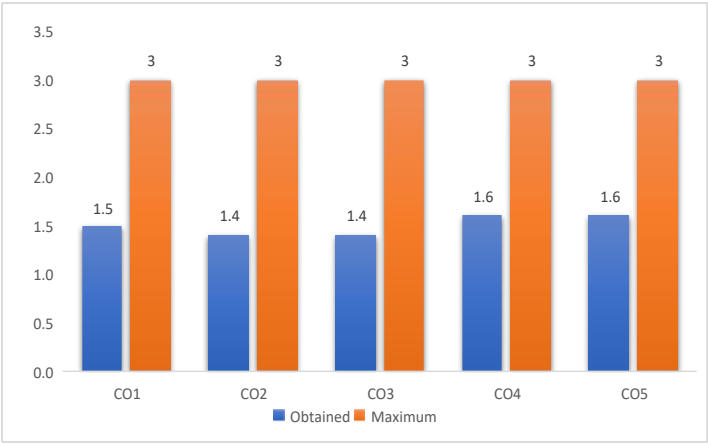
Course outcomes	Programme Outcomes								Program Specificoutcomes			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4
1	H		H					H	S	H		
2	H	H				H				S	H	
3			H		H			H	S			
4		H			S		H		S			H
5	H	H		S		H		S		S		H

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	47.3	0.0			100.0	3.0	100.0	3.0	100.0	3.0	81.8	2.0	2.2	65.5	1.0	1.0	1.5
CO2	47.3	0.0			100.0	3.0			100.0	3.0	81.8	2.0	2.0	65.5	1.0	1.0	1.4
CO3	47.3	0.0	83.6	2.0	100.0	3.0			100.0	3.0	81.8	2.0	2.0	65.5	1.0	1.0	1.4
CO4			83.6	2.0	100.0	3.0			100.0	3.0	81.8	2.0	2.5	65.5	1.0	1.0	1.6
CO5			83.6	2.0	100.0	3.0			100.0	3.0	81.8	2.0	2.5	65.5	1.0	1.0	1.6

AVERAGE	AVERAGE
1	1.496

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

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	
CO1	H 2.76		H 2.76						H 2.76
CO2	H 2.7	H 2.7					H 2.7		
CO3			H 2.76			H 2.76			H 2.76
CO4		H 2.9						H 2.9	
CO5	H 2.9	H 2.9					H 2.9		
AVERAGE OF COS FOR POS	2.786666667	2.833333333	2.76		2.76	2.8	2.9	2.76	
AVERAGE OF POS	2.795555556	2.833333333	2.76			2.76	2.8	2.9	2.76
AVERAGE	2.801269841								

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: Problem Solving and Programming in C
CREDITS: 4
COURSE CODE: BS19123

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs : B.Sc. Computer Science & Engineering

- **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):

- **PSO1:** Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions
- **PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.

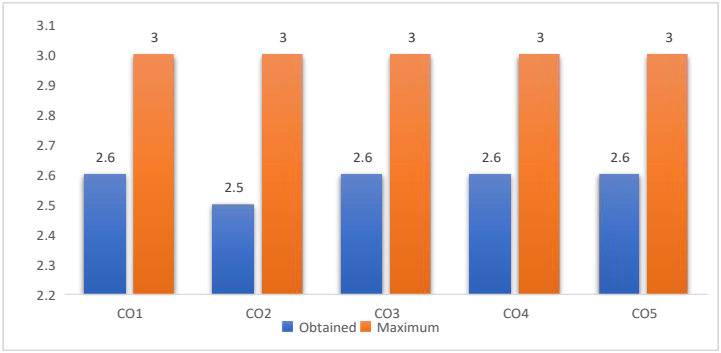
• **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies		
	COURSE OUTCOMES	**BLOOM'S TAXONOMY LEVEL**
CO1	**Explain** the basic introduction of computer and programming languages	II (UNDERSTAND)
CO2	**Categorize** different data types, operators and data input /output functions in 'C'.	IV(ANALYZE))
CO3	**Develop** programs using C control structures arrays and string concept	III (APPLY)
CO4	**Analyze** large problems into smaller ones using C functions	IV(ANALYZE)
CO5	**Create** programs using the concept of structures, union, file handling in C	VI(CREATE)

Table 1: CO, PO, PSO MAPPING

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H		S	H					H	S		
C02		H		H					H			S
C03		S	H						H		H	
C04	H	H	H						S		H	
C05	H	H	H							H		

Table 2: COURSE OUTCOME ATTAINMENTATTAINMENT 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	83.3	2.0			90.7	3.0	98.1	3.0	74.1	1.0	74.1	1.0	2.0	96.3	3.0	3.0	2.6
CO2	83.3	2.0			90.7	3.0			74.1	1.0	74.1	1.0	1.8	96.3	3.0	3.0	2.5
CO3	83.3	2.0	88.9	3.0	90.7	3.0			74.1	1.0	74.1	1.0	2.0	96.3	3.0	3.0	2.6
CO4			88.9	3.0	90.7	3.0			74.1	1.0	74.1	1.0	2.0	96.3	3.0	3.0	2.6
CO5			88.9	3.0	90.7	3.0			74.1	1.0	74.1	1.0	2.0	96.3	3.0	3.0	2.6

AVERAGE	AVERAGE
3	2.58

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.

OUTCOM	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO	H 2.9			H 2.9				
CO		H 2.9		H 2.9				
CO			H 2.9					
CO	H 2.9	H 2.9	H 2.9					
CO	H 2.9	H 2.9	H 2.9					
AVERAGE OF COS FOR	2.90666666	2.9	2.90666666	2.9				
AVERAGE OF	2.90222	2.9	2.90666	2.90				
AVERAG	2.90347222							

FIRST YEAR - II SEM

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: General English II
COURSE CODE: EN23201
CREDITS: 2

DEPARTMENT: B.SC. COMPUTER SCIENCE & ENGINEERING

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs : B.Sc. Computer Science & Engineering

PO1: Scientific knowledge: Apply the knowledge of science, mathematics, engineering and 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 and 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: Communication effectively on complex science and technology activities with society at large and able to write effective reports and documentation.
PO8: Life-long learning: Recognize the need and ability to engage in independent and life-long learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE) or PSOs:

B.Sc. Computer Science Engineering.

PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	To identify a sound understanding on the formation of words and to demonstrate the functional grammatical component in the sentence.	II (ANALYZE)
CO2	To paraphrase ideas and thoughts in a coherent, neat and organized manner in order to utilize the writing skills for sound writing propagandas.	VI(CREATE)
CO3	To create an understanding on Indian Literature, alongside to develop and chisel their communication skills	III (APPLY)
CO4	To recognize the moral element which underlies in the short story; an exposure to informal language.	V(EVALUATE)
CO5	To develop listening and speaking skills through effective sentence constructions and efficient delivery .	VI(CREATE)

Table 1: CO, PO, PSO MAPPING

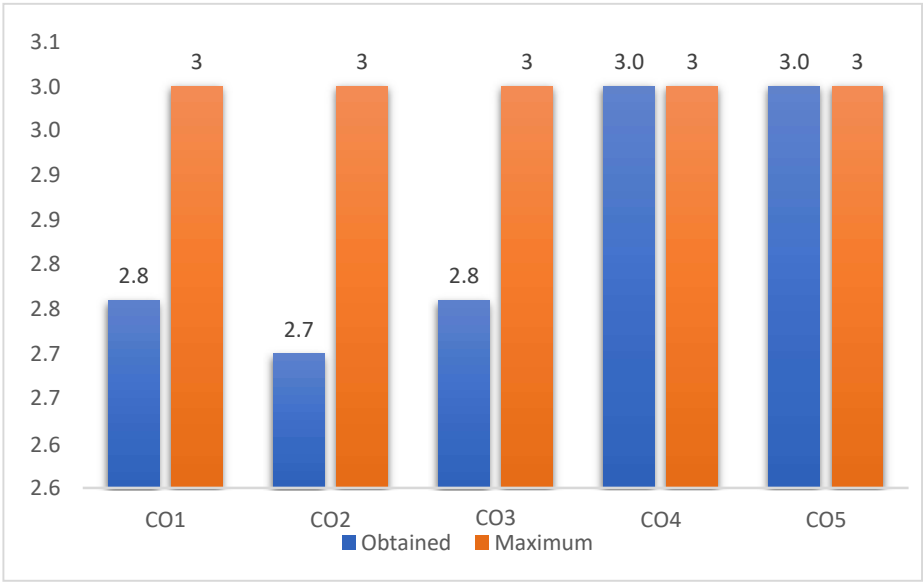
Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P08**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	
1	**H**			**H**			**H**	**S**		**H**	**H**		
2		**H**				**H**		**H**	**H**		**H**		
3	**H**		**H**		**H**	**H**		**H**		**H**		**S**	
4	**H**	**S**										**H**	
5	**H**		**H**	**H**	**S**	**H**				**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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	46.3	0.0			100.0	3.0	100.0	3.0	100.0	3.0	92.6	3.0	2.4	98.1	3.0	3.0	2.8
CO2	46.3	0.0			100.0	3.0			100.0	3.0	92.6	3.0	2.3	98.1	3.0	3.0	2.7
CO3	46.3	0.0	100.0	3.0	100.0	3.0			100.0	3.0	92.6	3.0	2.4	98.1	3.0	3.0	2.8
CO4			100.0	3.0	100.0	3.0			100.0	3.0	92.6	3.0	3.0	98.1	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	92.6	3.0	3.0	98.1	3.0	3.0	3.0

AVERAGE	AVERAGE
3	2.844

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				
CO3			H 3					
CO4	H 3	H 3	H 3					
CO5	H 3	H 3	H 3					
AVERAGE OF COS FOR POS	3	3	3	3				
AVERAGE OF POS	3	3	3	3				
AVERAGE	3							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: Indian Heritage and Culture
COURSE CODE: IC23201
CREDITS: 2

DEPARTMENT: B. SC. COMPUTER SCIENCE & ENGINEERING

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs : B.Sc. Computer Science & Engineering

PO1: Scientific knowledge: Apply the knowledge of science, mathematics, engineering and 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 analyse 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 and 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: Communication effectively on complex science and technology activities with society at large and able to write effective reports and documentation.
PO8: Life-long learning: Recognize the need and ability to engage in independent and life-long learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE) or PSOs:
B.Sc. Computer Science Engineering.
PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	To have knowledge of Indian Customs and Traditions.	II (ANALYZE)
CO2	To have knowledge about Indian Customs and Traditions.	VI(CREATE)
CO3	To make use of the subject knowledge to attempt all kinds of competitive Especially civil services.	III (APPLY)

CO4	To make use of the subject knowledge to attempt all kinds of competitive Especially civil services	V(EVALUATE)
CO5	To help the student community to have knowledge of history and contemporary social, religious and political issues of the nation.	VI(CREATE)

Table 1: CO, PO, PSO MAPPING

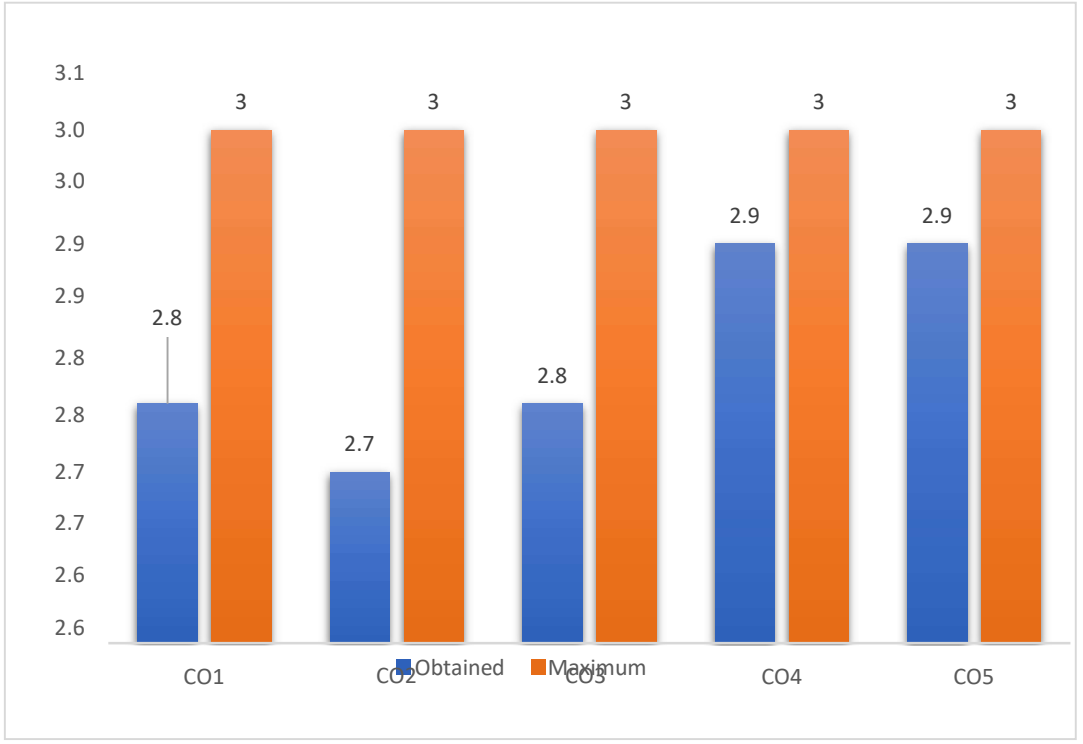
Course outcomes	**Programme Outcomes**								**Program Specific outcomes**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P08**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	
1	**H**			**H**			**H**	**S**		**H**	**H**		
2		**H**				**H**		**H**	**H**		**H**		
3	**H**		**H**		**H**	**H**		**H**		**H**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



x

co	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	94.4	3.0	94.4	3.0	85.2	3.0	3.0	100.0	3.0	3.0	3.0
CO2	100.0	3.0			100.0	3.0			94.4	3.0	85.2	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			94.4	3.0	85.2	3.0	3.0	100.0	3.0	3.0	3.0
CO4			100.0	3.0	100.0	3.0			94.4	3.0	85.2	3.0	3.0	100.0	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			94.4	3.0	85.2	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 examare 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. 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

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 3			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							
CO5	H 3		H 3	H 3		H 3		
AVERAGE OF COS FORPOS	3	3	3	3	3	3	3	3
AVERAGE OF POS	3	3	3	3	3	3	3	3
AVERAGE	3							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: Mathematics II
COURSE CODE: BS18201
CREDITS: 2

DEPARTMENT: B.SC. COMPUTER SCIENCE & ENGINEERING

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs : B.Sc. Computer Science & Engineering

PO1: Scientific knowledge: Apply the knowledge of science, mathematics, engineering and 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 analyse 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 and 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: Communication effectively on complex science and technology activities with society at large and able to write effective reports and documentation.
PO8: Life-long learning: Recognize the need and ability to engage in independent and life-long learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE) or PSOs:
B.Sc. Computer Science Engineering.
PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	Categorize the vector-valued functions of a real variable and their curves, Gradient vector fields and constructing potentials.	II (ANALYZE)
CO2	Analyze the differential ideas of divergence, curl, and the Laplacian along with their physical interpretations	VI(CREATE)
CO3	Use the applications of Green's theorem in the plane, Gauss divergence theorem and Stake's theorem.	III (APPLY)

CO4	Formulate the solution set of a system of linear equations	V(EVALUATE)
CO5	To solve the characteristic polynomial, eigenvectors, eigenvalues.	VI(CREATE)

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

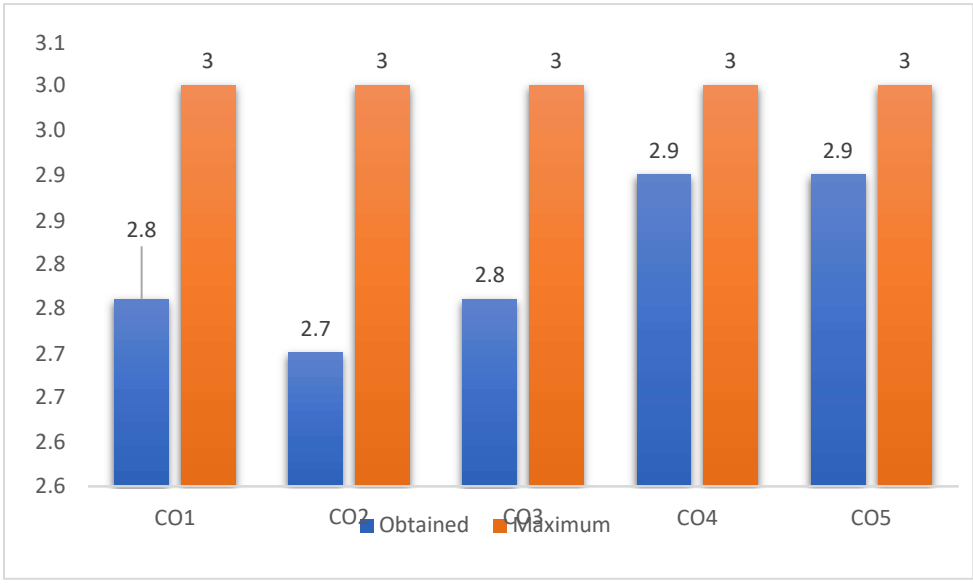
H: Highly Supportive **S: Supportive**

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 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	94.4	3.0	94.4	3.0	85.2	3.0	3.0	100.0	3.0	3.0	3.0
CO2	100.0	3.0			100.0	3.0			94.4	3.0	85.2	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			94.4	3.0	85.2	3.0	3.0	100.0	3.0	3.0	3.0
CO4			100.0	3.0	100.0	3.0			94.4	3.0	85.2	3.0	3.0	100.0	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			94.4	3.0	85.2	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

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 3			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							
CO5	H 3		H 3	H 3		H 3		
AVERAGE OF COS FORPOS	3	3	3	3	3	3	3	3
AVERAGE OF POS	3	3	3	3	3	3	3	3
AVERAGE	3							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: Logic and Digital Circuits
COURSE CODE: BS22204
CREDITS: 2

DEPARTMENT: B.SC. COMPUTER SCIENCE & ENGINEERING

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs : B.Sc. Computer Science & Engineering

PO1: Scientific knowledge: Apply the knowledge of science, mathematics, engineering and 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 analyse 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 and 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: Communication effectively on complex science and technology activities with society at large and able to write effective reports and documentation.
PO8: Life-long learning: Recognize the need and ability to engage in independent and life-long learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE) or PSOs:

B.Sc. Computer Science Engineering.

PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMEs	BLOOM'S TAXONOMY LEVEL
CO1	Convert different type of codes and number systems which are used in digital communication and computer systems.	II (ANALYZE)
CO2	Employ the codes and number systems converting circuits and Compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency.	VI(CREATE)
CO3	Analyze different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods.	III (APPLY)
CO4	Design different types of with memory element digital electronic circuits for particular operation, within the realm of economic, performance, efficiency, user friendly and environmental constraints.	V(EVALUATE)
CO5	Assess the nomenclature and technology in the area of memory devices and apply the memory devices in different types of digital circuits for real world application.	VI(CREATE)

Table 1: CO, PO, PSO MAPPING

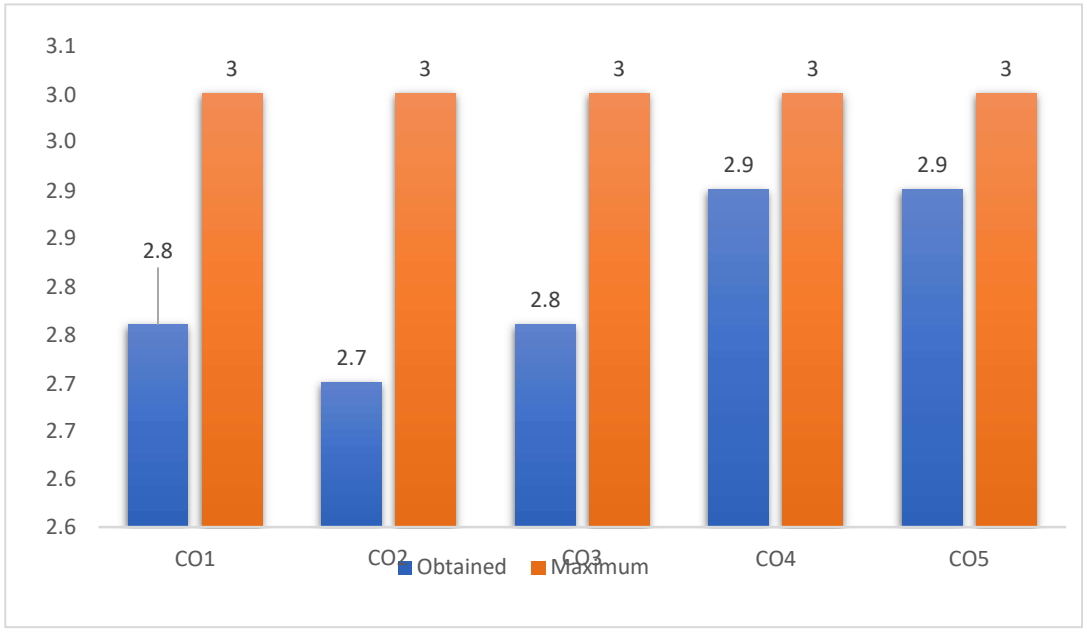
Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P08**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	
1	**H**			**H**			**H**	**S**		**H**	**H**		
2		**H**				**H**		**H**	**H**		**H**		
3	**H**		**H**		**H**	**H**		**H**		**H**		**S**	
4	**H**	**S**										**H**	
5	**H**		**H**	**H**	**S**	**H**				**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		assign ment		viva		Attendence			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attain ment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	66.0	1.0			101.9	3.0	101.9	3.0	101.9	3.0	84.9	2.0	2.4	92.5	3.0	3.0	2.8
CO2	66.0	1.0			101.9	3.0			101.9	3.0	84.9	2.0	2.3	92.5	3.0	3.0	2.7
CO3	66.0	1.0	98.1	3.0	101.9	3.0			101.9	3.0	84.9	2.0	2.4	92.5	3.0	3.0	2.8
CO4			98.1	3.0	101.9	3.0			101.9	3.0	84.9	2.0	2.8	92.5	3.0	3.0	2.9
CO5			98.1	3.0	101.9	3.0			101.9	3.0	84.9	2.0	2.8	92.5	3.0	3.0	2.9

AVERAGE	AVERAGE
3	2.804

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

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

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: C++ and Data Structures
COURSE CODE: BS22202
CREDITS: 2

DEPARTMENT: B.SC. COMPUTER SCIENCE & ENGINEERING

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs : B.Sc. Computer Science & Engineering

PO1: Scientific knowledge: Apply the knowledge of science, mathematics, engineering and 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 analyse 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 and 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: Communication effectively on complex science and technology activities with society at large and able to write effective reports and documentation.

PO8: Life-long learning: Recognize the need and ability to engage in independent and life-long learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE) or PSOs:

B.Sc. Computer Science Engineering.

PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.

PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.

PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.

PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	Choose appropriate data structures to represent data items in real world problems	III (Apply)
CO2	Illustrate non-linear data structures like linked list	II (Understand)
CO3	Organise the data using sorting in various linear data structures and determine time complexity.	VI (Create)
CO4	Construct data with non-linear data structure using trees.	VI (Create)
CO5	Explain the concept of graphs and B-trees	III (Apply)

TABLE 1: CO, PO, PSO MAPPING

PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
H							**S**		**H**	
	H						**S**		**H**	
		H					**H**		**H**	
H							**S**		**H**	
H									**H**	

Table 2: COURSE OUTCOME ATTAINMENT

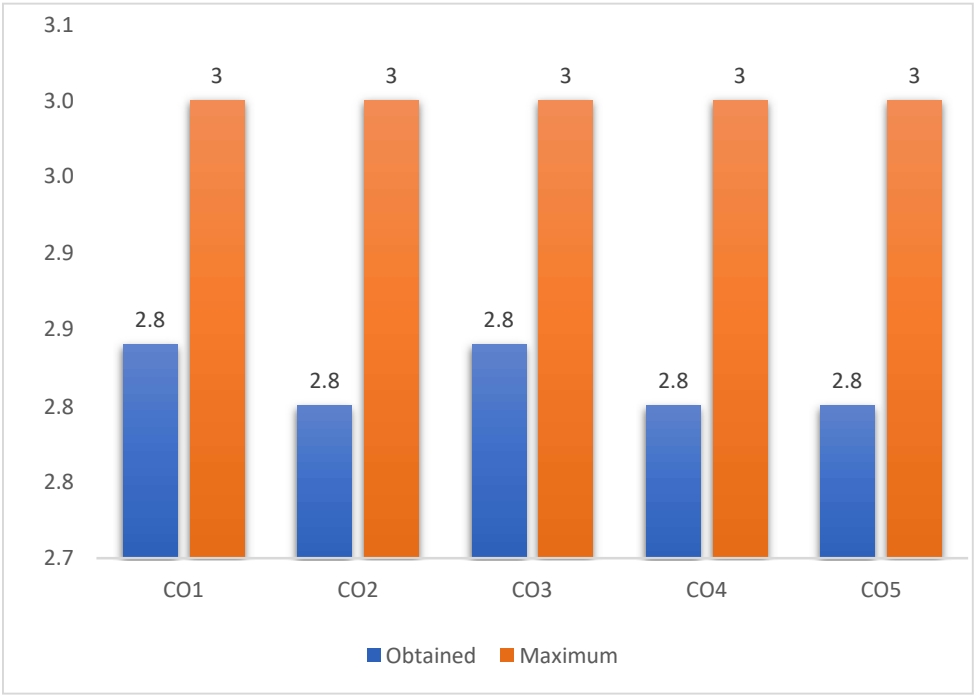
ATTAINMENT SCALE:

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	96.3	3.0			100.0	3.0	100.0	3.0	100.0	3.0	88.9	3.0	3.0	72.2	1.0	1.0	1.8
CO2	96.3	3.0	96.3	3.0	100.0	3.0			100.0	3.0	88.9	3.0	3.0	72.2	1.0	1.0	1.8
CO3	96.3	3.0	96.3	3.0	100.0	3.0			100.0	3.0	88.9	3.0	3.0	72.2	1.0	1.0	1.8
CO4			96.3	3.0	100.0	3.0			100.0	3.0	88.9	3.0	3.0	72.2	1.0	1.0	1.8
CO5			96.3	3.0	100.0	3.0			100.0	3.0	88.9	3.0	3.0	72.2	1.0	1.0	1.8

AVERAGE	AVERAGE
3	1.8

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

OUTCOME	PO1	PO2	PO3	PO4	PO5	PO7	PO8
CO1	H 2.76		H 2.76				H 2.76
CO2	H 2.7			H 2.7			
CO3	H 2.76						H 2.76
CO4	H 2.7						H 2.7
CO5	H 2.7			H 2.7			
AVERAGE OF COS FOR POS	2.724		2.76	2.7			2.74
AVERAGE OF POS	2.7168		2.76	2.7			2.733333333
AVERAGE							

SECOND YEAR - I SEM

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: Environmental Studies and Gender Sensitization
CREDITS: 4
COURSE CODE: ES18101

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

Programme Outcomes – B. Sc. Computer Science & Engineering

- **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):

- **PSO1:** Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Understand** the importance of Environmental education, conservation of natural resources & Understand the importance of ecosystems and biodiversity	II (UNDERSTAND)
CO2	**Understand** the pollution problems and Apply the environmental science knowledge on solid waste management, disaster management	II(UNDERSTAND)
CO3	**Apply** the environmental science knowledge to Improve the resources and Evaluate and understand the sustainable environmental conditions and control methods	III (APPLY)
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	**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

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H			H			H	S		H	H	
C02		H				H		H	H		H	
C03	H		H		H	H		H		H		S
C04	H	S										H
C05	H		H	H	S	H				H	S	

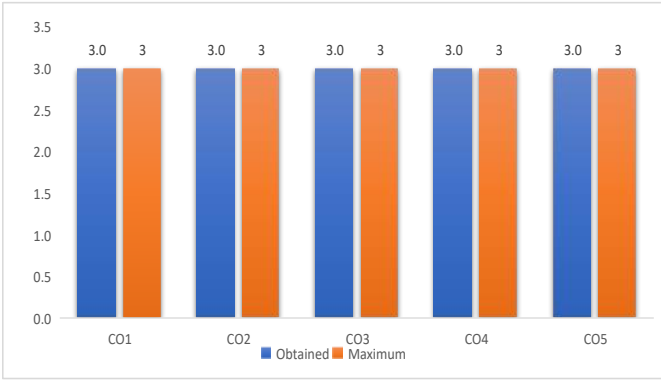
H: Highly Supportive

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	98.1	3.0			100.0	3.0	100.0	3.0	100.0	3.0	86.8	3.0	3.0	100.0	3.0	3.0	3.0
CO2	98.1	3.0			100.0	3.0			100.0	3.0	86.8	3.0	3.0	100.0	3.0	3.0	3.0
CO3	98.1	3.0	100.0	3.0	100.0	3.0			100.0	3.0	86.8	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	86.8	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	86.8	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							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: PC OPERATING SYSTEMS
COURSE CODE: G20CS1T
CREDITS: 4

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

Programme Outcomes – B. Sc. Computer Science & Engineering

- **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):

- **PSO1:** Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real-world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

CO	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Understand** fundamentals of personal computer operating systems	II (UNDERSTAND)
CO2	**Demonstrate** installation and configuring of operating systems	III(APPLY)
CO3	**Understand** file management, memory and storage management	II (UNDERSTAND)
CO4	**Demonstrate** control of peripheral devices	V(EVALUTING)
CO5	Evaluate use of utilities	VI(CREATE)

Table 1: CO, PO, PSO MAPPING

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	**H**								**H**			
C02		**H**						**H**		**H**		**H**
C03	**H**		**H**	**H**					**H**		**H**	
C04			**H**	**H**				**H**		**H**	**S**	**H**
C05			**H**		**S**			**H**		**H**		**H**

H: Highly Supportive

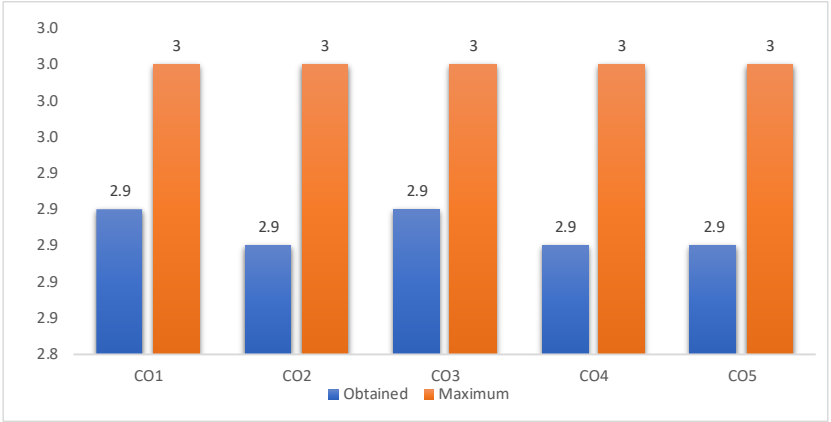
S: Supportive

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	96.2	3.0			100.0	3.0	98.1	3.0	100.0	3.0	77.4	2.0	2.8	100.0	3.0	3.0	2.9
CO2	96.2	3.0			100.0	3.0			100.0	3.0	77.4	2.0	2.8	100.0	3.0	3.0	2.9
CO3	96.2	3.0	98.1	3.0	100.0	3.0			100.0	3.0	77.4	2.0	2.8	100.0	3.0	3.0	2.9
CO4			98.1	3.0	100.0	3.0			100.0	3.0	77.4	2.0	2.8	100.0	3.0	3.0	2.9
CO5			98.1	3.0	100.0	3.0			100.0	3.0	77.4	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		2.90666667	2.9
AVERAGE	2.907144444							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: OPERATING SYSTEM
COURSE CODE: BS18330
CREDITS: 4

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

Programme Outcomes – B. Sc. Computer Science & Engineering

- **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):

- **PSO1:** Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Explain** functions, types and structures of operating system	II (UNDERSYAND)
CO2	**Analyze** various process management concepts including scheduling and synchronization	IV(ANALYZE)
CO3	**Demonstrate** process synchronization and dead locks	II (UNDERSTAND)
CO4	**Solve** issues related to file system interface	III(APPLY)
CO5	**Choose** an appropriate Page replacement algorithm	VI(CREATE)

Table 1: CO, PO, PSO MAPPING

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H		H						H	H		
C02	H	H		H					H		H	
C03		H		H				H	H	H		
C04		H		H					H		H	
C05		H						H	H	H	H	

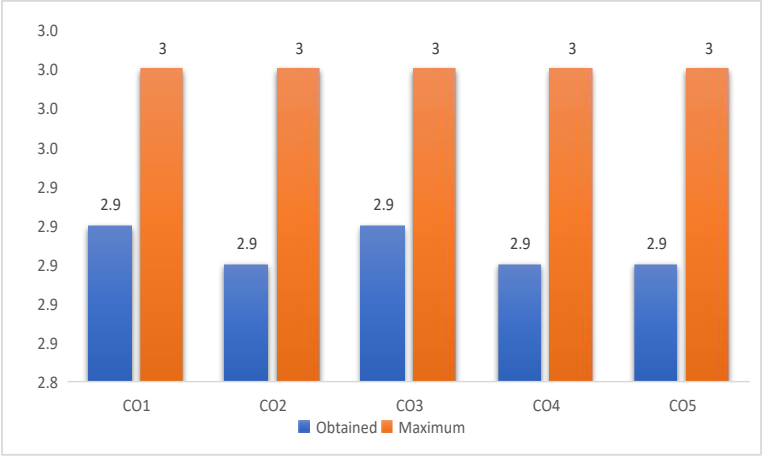
H: Highly Supportive

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	96.2	3.0			100.0	3.0	98.1	3.0	100.0	3.0	77.4	2.0	2.8	100.0	3.0	3.0	2.9
CO2	96.2	3.0			100.0	3.0			100.0	3.0	77.4	2.0	2.8	100.0	3.0	3.0	2.9
CO3	96.2	3.0	98.1	3.0	100.0	3.0			100.0	3.0	77.4	2.0	2.8	100.0	3.0	3.0	2.9
CO4			98.1	3.0	100.0	3.0			100.0	3.0	77.4	2.0	2.8	100.0	3.0	3.0	2.9
CO5			98.1	3.0	100.0	3.0			100.0	3.0	77.4	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							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: Electrical Circuits and Machines
COURSE CODE: CS18301
CREDITS: 4

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

Programme Outcomes – B. Sc. Computer Science & Engineering

- **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):

- **PSO1:** Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the realworld problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts ofcomputer science and apply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining ofvarying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

CO	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	Student will be able to **analyze** the electrical circuits with help of KCL and KVL techniques.	IV (ANALYZE)
CO2	Students will be able to **explain** the operation of DC generator and analyze the Characteristics of DC generator.	II (UNDERSTAND)
CO3	Student will be able to **explain** the principle of operation of DC motor and analyze their Characteristics. Acquire the skills to analyze the starting and speed control methods of DC motors.	II (UNDERSTAND)
CO4	**Judge** to develop equivalent circuit and evaluate performance of transformers.	V(EVALUTING)
CO5	**Ability** to identify speed – torque characteristics of induction motor and understand starting methods of induction motor.	I(REMEMBER)

Table 1: CO, PO, PSO MAPPING

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	**H**								**H**			
C02				**H**								
C03						**H**				**H**		
C04	**H**											**H**
C05	**H**											**H**

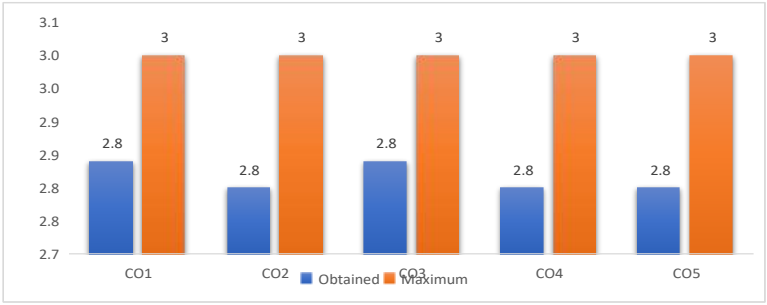
H: Highly Supportive

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	96.3	3.0			100.0	3.0	100.0	3.0	100.0	3.0	66.7	1.0	2.6	98.1	3.0	3.0	2.8
CO2	96.3	3.0			100.0	3.0			100.0	3.0	66.7	1.0	2.5	98.1	3.0	3.0	2.8
CO3	96.3	3.0	98.1	3.0	100.0	3.0			100.0	3.0	66.7	1.0	2.6	98.1	3.0	3.0	2.8
CO4			98.1	3.0	100.0	3.0			100.0	3.0	66.7	1.0	2.5	98.1	3.0	3.0	2.8
CO5			98.1	3.0	100.0	3.0			100.0	3.0	66.7	1.0	2.5	98.1	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 2.76							
CO2				H 2.7				
CO3						H 2.76		
CO4	H 2.7							
CO5	H 2.7							
AVERAGE OFCOS FOR POS	2.72			2.7		2.76		
AVERAGE OFPOS	2.706667			2.7		2.76		
AVERAGE	2.722222222							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: Object oriented Programming through Java
COURSE CODE: CS20302
CREDITS: 4

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

Programme Outcomes – B. Sc. Computer Science & Engineering

- **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):

- **PSO1:** Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Understand** fundamentals of object oriented concept, classes, objects and methods	II (UNDERSTAND)
CO2	**Apply** inheritance, packages and exceptional handling techniques.	III(APPLY)
CO3	**Demonstrate** Threads and applet programming.	II (UNDERSTAND)
CO4	**Express** event handling and swing components.	V(EVALUTING)
CO5	**Design** interactive programs using swing	VI(CREATE)

Table 1: CO, PO, PSO MAPPING

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H								H			
C02		H						H		H		H
C03	H		H	H					H		H	
C04			H	H				H		H	S	H
C05			H		S			H		H		H

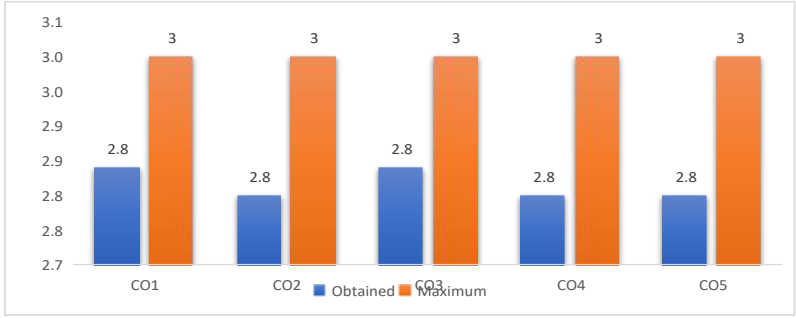
H: Highly Supportive

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	96.3	3.0			100.0	3.0	100.0	3.0	100.0	3.0	66.7	1.0	2.6	98.1	3.0	3.0	2.8
CO2	96.3	3.0			100.0	3.0			100.0	3.0	66.7	1.0	2.5	98.1	3.0	3.0	2.8
CO3	96.3	3.0	98.1	3.0	100.0	3.0			100.0	3.0	66.7	1.0	2.6	98.1	3.0	3.0	2.8
CO4			98.1	3.0	100.0	3.0			100.0	3.0	66.7	1.0	2.5	98.1	3.0	3.0	2.8
CO5			98.1	3.0	100.0	3.0			100.0	3.0	66.7	1.0	2.5	98.1	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 examare 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 attainmentlevel.

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							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: DISCRETE MATHEMATICS
COURSE CODE: BS18335
CREDITS: 4

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

Programme Outcomes – B. Sc. Computer Science & Engineering

- **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):

- **PSO1:** Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

CO	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Develop** understanding of Logic Sets and Functions	VI(CREATE)
CO2	**Evaluate** and apply the fundamental concepts in graph theory	V(EVALUATING)
CO3	**Develop** an understanding of how graph and tree concepts are used to solve problems arising in the computer science.	VI(CREATE)
CO4	**Express** the concepts and results of Number Theory.	III(APPLY)
CO5	**Identify** methods and techniques used in number theory.	III(APPLY)

Table 1: CO, PO, PSO MAPPING

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H			H			H	S		H	H	
C02		H				H		H	H		H	
C03	H		H		H	H		H		H		S
C04	H	S										H
C05	H	H	H	H	S	H				H	S	

H: Highly Supportive

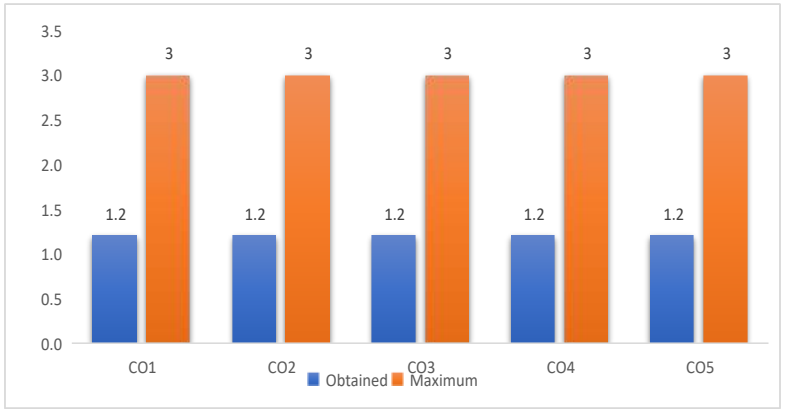
S: Supportive

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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	88.7	3.0			96.2	3.0	94.3	3.0	94.3	3.0	86.8	3.0	3.0	64.2	0.0	0.0	1.2
CO2	88.7	3.0			96.2	3.0			94.3	3.0	86.8	3.0	3.0	64.2	0.0	0.0	1.2
CO3	88.7	3.0	96.2	3.0	96.2	3.0			94.3	3.0	86.8	3.0	3.0	64.2	0.0	0.0	1.2
CO4			96.2	3.0	96.2	3.0			94.3	3.0	86.8	3.0	3.0	64.2	0.0	0.0	1.2
CO5			96.2	3.0	96.2	3.0			94.3	3.0	86.8	3.0	3.0	64.2	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	PO5	PO6	PO7	PO8
CO1	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	H 1.2		H 1.2	
CO4	H 1.2		H 1.2	H 1.2			H 1.2	
CO5	H 1.2		H 1.2	H 1.2				H 1.2
AVERAGE OF COS FOR POS	1.2		1.2	1.2	1.2		1.2	1.2
AVERAGE OF POS	1.2		1.2	1.2	1.2		1.2	1.2
AVERAGE	1.2							

SECOND YEAR - II SEM

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: PROBABILITY & STATISTICS
COURSE CODE: CS18401
CREDITS: 4

DEPARTMENT: B. SC. COMPUTER SCIENCE AND ENGINEERING

Programme Outcomes – B. Sc. Computer Science And Engineering

- **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: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the realworld problems.**
- **PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts ofcomputer science and apply the knowledge in designing and building software solutions.**
- **PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining ofvarying complexity.**
- **PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.**

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Calculate** the mean, median, and mode of a set of data and **identify** the importance of measures of dispersion.	II (UNDERSTANDING)
CO2	**Use** discrete and continuous probability distributions, including requirements and making decisions.	V(EVALUATE)
CO3	**Employee** the principles of linear regression and correlation, including least square method, predicting a particular value of Y for a given value of X and significance of the correlation coefficient.	IV (ANALYZING)
CO4	**Knowledge** about formulating and testing a hypothesis, using critical values to draw conclusions and determining probability of making errors in hypothesis tests, and about large sample tests.	III(APPLY)
CO5	**Understand** and **analyze** various methods of small sample tests.	VI(CREATING)

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**								
2			**H**										
3			**H**							**H**	**H**		
4	**H**			**H**					**H**				
5		**H**		**H**							**H**		

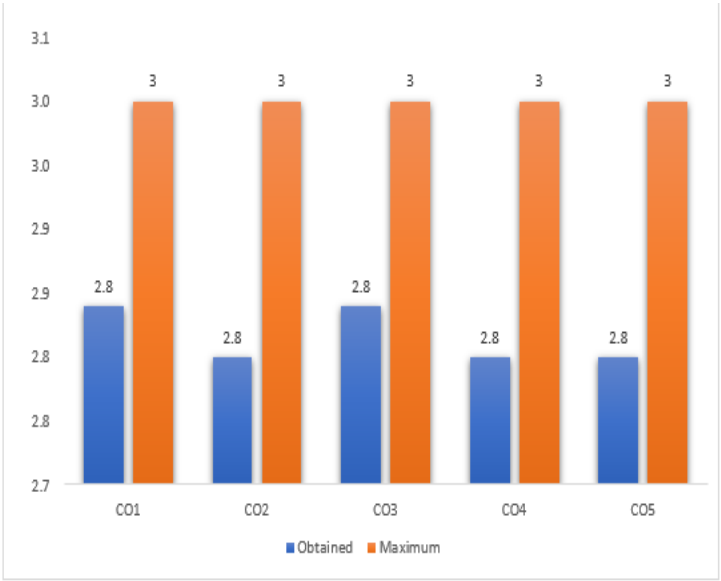
H: Highly Supportive

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	96.2	3.0			103.8	3.0	103.8	3.0	103.8	3.0	73.1	1.0	2.6	103.8	3.0	3.0	2.8
CO2	96.2	3.0			103.8	3.0			103.8	3.0	73.1	1.0	2.5	103.8	3.0	3.0	2.8
CO3	96.2	3.0	103.8	3.0	103.8	3.0			103.8	3.0	73.1	1.0	2.6	103.8	3.0	3.0	2.8
CO4			103.8	3.0	103.8	3.0			103.8	3.0	73.1	1.0	2.5	103.8	3.0	3.0	2.8
CO5			103.8	3.0	103.8	3.0			103.8	3.0	73.1	1.0	2.5	103.8	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		2.81333	2.8
AVERAGE	2.814288889							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: SOFTWARE ENGINEERING
COURSE CODE: CS20403
CREDITS: 4

DEPARTMENT: B. SC. COMPUTER SCIENCE AND ENGINEERING

Programme Outcomes – B. Sc. Computer Science And Engineering

- **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 OUTCOME (DEPARTMENT WISE):

- **PSO1**: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real-world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

TABLE 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific outcomes			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	**H**		H					H	S			
C02	**H**			H					S			
C03	**H**							H	S			
C04	**H**							H	S			
C05	**H**			H					S			

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
CO1	96.3	3.0			100.0	3.0	98.1	3.0	100.0	3.0	63.0	0.0	2.4	94.4	3.0	3.0
CO2	96.3	3.0			100.0	3.0			100.0	3.0	63.0	0.0	2.3	94.4	3.0	3.0
CO3	96.3	3.0	100.0	3.0	100.0	3.0			100.0	3.0	63.0	0.0	2.4	94.4	3.0	3.0
CO4			100.0	3.0	100.0	3.0			100.0	3.0	63.0	0.0	2.3	94.4	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	63.0	0.0	2.3	94.4	3.0	3.0

AVERAGE	AVERAGE
3	2.724

Table 3: PROGRAMME OUTCOME MAPPING

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			H 2.6	
CO3	H 2.52		H 2.52	H 2.52	H 2.52		H 2.52	
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	2.56		2.56	2.53	2.52		2.54	2.5
AVERAGE OF POS	2.536		2.536	2.53	2.52		2.54	2.5
AVERAGE	2.527							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: COMPUTER ORGANIZATION
COURSE CODE:CS20402
CREDITS: 4

DEPARTMENT:B.SC. COMPUTER SCIENCE AND ENGINEERING

Programme Outcomes – B. Sc. Computer Science And Engineering

- **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:** Recognize the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE):

- **PSO1**: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real-world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

CO	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Demonstrate** knowledge of register organization of a basic computer system	II (UNDERSTANDING)
CO2	**Explain** machine language of a basic computer system	V(EVALUATE)
CO3	**Appraise** in-depth understanding of control unit organization and micro programmed control	IV (ANALYZING)
CO4	**Apply** various algorithms to perform arithmetic operations and propose suitable hardware for them	III(APPLY)
CO5	**Analyze** and emphasize various communication media in the basic computer system using design of various memory structures.	VI ANALYZING)

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**

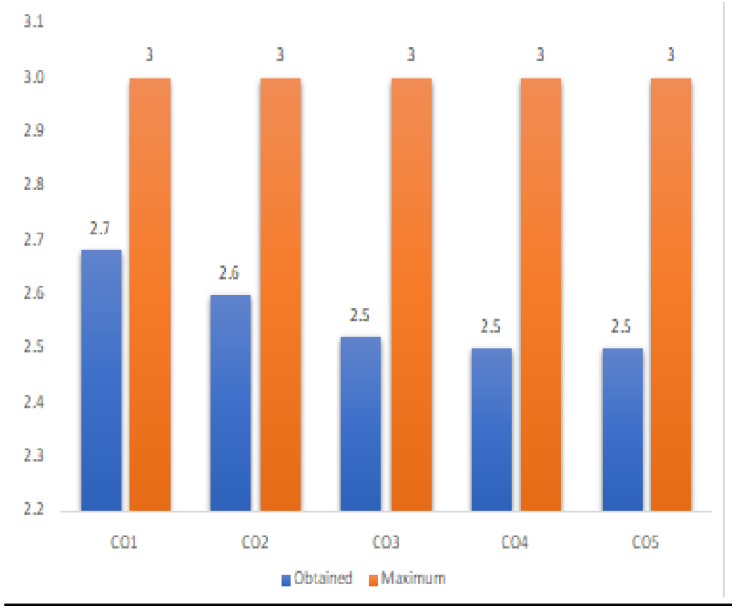
H: Highly Supportive

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	79.2	2.0			96.2	3.0	100.0	3.0	100.0	3.0	35.8	0.0	2.2	100.0	3.0	3.0	2.7
CO2	79.2	2.0			96.2	3.0			100.0	3.0	35.8	0.0	2.0	100.0	3.0	3.0	2.6
CO3	79.2	2.0	67.9	1.0	96.2	3.0			100.0	3.0	35.8	0.0	1.8	100.0	3.0	3.0	2.5
CO4			67.9	1.0	96.2	3.0			100.0	3.0	35.8	0.0	1.8	100.0	3.0	3.0	2.5
CO5			67.9	1.0	96.2	3.0			100.0	3.0	35.8	0.0	1.8	100.0	3.0	3.0	2.5

AVERAGE	AVERAGE
3	2.56

Table 3: PROGRAMME OUTCOME MAPPING

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			H 2.6	
CO3	H 2.52		H 2.52	H 2.52	H 2.52		H 2.52	
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	2.56		2.56	2.53	2.52		2.54	2.5
AVERAGE OF POS	2.536		2.536	2.53	2.52		2.54	2.5
AVERAGE	2.527							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: MICROPROCESSOR AND MICROCONTROLLER

COURSE CODE: BS20404

CREDITS: 3

DEPARTMENT: B. Sc. Computer Science and Engineering

Programme Outcomes – B. Sc. Computer Science And Engineering

- **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, graphicaland symbolic representations.
- **PSO2.** Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety ofdisciplines.
- **PSO3.** Use emerging technologies and computing concepts.
- **PSO4.** Apply mathematical, computational and statistical tools to detect patterns and model performance.

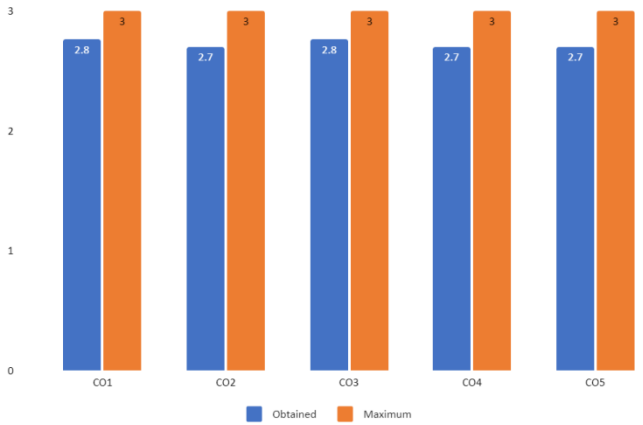
	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Understand** the microprocessor architecture with the help of 8086	III (APPLY)
CO2	**Study** the concepts of interfacing techniques	IV(ANALYZE)
CO3	**Study** microprocessor programming applications	III (APPLY)
CO4	**Understand** the differences between microprocessor and microcontroller	III (APPLY)
CO5	**Study** the architecture of 8051 microcontroller	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	S		H	H	S		S	H	S	S		S	
2	S		S	H		S	S	S	H	H		H	
3	H		H	H		S	H	S	S	H		H	
4	S		S	H		S	S	H		H	S	H	
5	H		H	H	S		S	S		S		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 average	pass %	Attainment level	co wise external average	co wise total average
CO1	98.1	3.0			100.0	3.0	100.0	3.0	100.0	3.0	43.4	0.0	2.4	100.0	3.0	3.0	2.8
CO2	98.1	3.0			100.0	3.0			100.0	3.0	43.4	0.0	2.3	100.0	3.0	3.0	2.7
CO3	98.1	3.0	98.1	3.0	100.0	3.0			100.0	3.0	43.4	0.0	2.4	100.0	3.0	3.0	2.8
CO4			98.1	3.0	100.0	3.0			100.0	3.0	43.4	0.0	2.3	100.0	3.0	3.0	2.7
CO5			98.1	3.0	100.0	3.0			100.0	3.0	43.4	0.0	2.3	100.0	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							H	2.76
CO2							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								
AVERAGE OFCOS FOR POS	2.73				2.74		2.724						2.76		2.73	
AVERAGE OF POS		2.73				2.733333333		2.7168						2.76		2.715
AVERAGE	2.731026667															

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: DATABASE MANAGEMENT SYSTEMS
COURSE CODE: CS18406
CREDITS: 4

DEPARTMENT: B.SC. COMPUTER SCIENCE AND ENGINEERING

PROGRAMME OUTCOMES(BSC) :BSc. Computer Science and Engineering

- 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 thatmeet 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 conclusionsusing 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 scienceand 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 OUTCOME (DEPARTMENT WISE):

- PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
- PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Represent** logical database using Entity Relationship and Enhanced ER model.	IV (APPLYING)
CO2	**Formulate** database using relational algebra and organize relation using normalization	VI (CREATE)
CO3	**Design** SQL queries and implements PL/SQL	VI (Create)
CO4	**Classify** the storage and file structure, storage access, indexing and hashing techniques of the database	III (Apply)
CO5	**Explain** the concept of Transactions, recovery system and concurrency control	IV (Analyze)

TABLE 1: CO, PO, PSO MAPPING

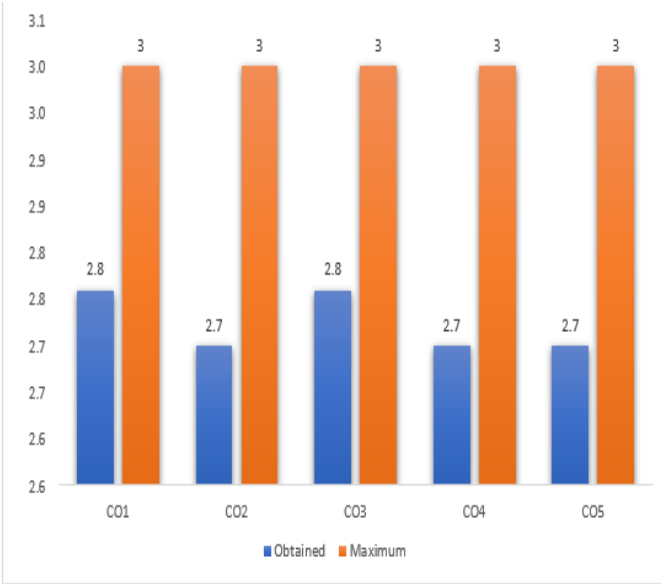
Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	H			H					H	H			
2		H		H				H	H				
3		H		H				H			H		
4	H			H				H	H				
5		H		H						H	H		

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	88.7	3.0			100.0	3.0	100.0	3.0	100.0	3.0	52.8	0.0	2.4	100.0	3.0	3.0	2.8
CO2	88.7	3.0			100.0	3.0			100.0	3.0	52.8	0.0	2.3	100.0	3.0	3.0	2.7
CO3	88.7	3.0	98.1	3.0	100.0	3.0			100.0	3.0	52.8	0.0	2.4	100.0	3.0	3.0	2.8
CO4			98.1	3.0	100.0	3.0			100.0	3.0	52.8	0.0	2.3	100.0	3.0	3.0	2.7
CO5			98.1	3.0	100.0	3.0			100.0	3.0	52.8	0.0	2.3	100.0	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							
CO2		H 2.7		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				
AVERAGE OF COS FOR POS	2.73	2.72		2.715				2.72
AVERAGE OF POS	2.715	2.72		2.715				2.72
AVERAGE	2.7175							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: OBJECT ORIENTED SYSTEMS DEVELOPMENT
COURSE CODE: CS20405
CREDITS: 4

DEPARTMENT: B.SC. COMPUTER SCIENCE AND ENGINEERING

Programme Outcomes – B. Sc. Computer Science And Engineering

- **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 thatmeet 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 OUTCOME (DEPARTMENT WISE):

- **PSO1**: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real-world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

	COURSE OUTCOMES	**BLOOM'S TAXONOMY LEVEL**
CO1	**Explain** basics of OOSD concepts	IV (APPLYING)
CO2	**Categorize** Object oriented methodologies and UML diagrams.	VI (CREATE)
CO3	**Choose** classification theory and performing case studies.	VI (Create)
CO4	**Design** models based on Object oriented concept.	III (Apply)
CO5	**Identify** software quality, system usability, measuring and satisfaction	IV (Analyze)

TABLE 1: CO, PO, PSO MAPPING

Course outcomes	Program Outcomes								Program SpecificOutcomes			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	**H**		H					H	S			
C02	**H**			H					S			
C03	**H**							H	S			
C04	**H**							H	S			
C05	**H**			H					S			

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
CO1	96.3	3.0			100.0	3.0	98.1	3.0	100.0	3.0	63.0	0.0	2.4	94.4	3.0	3.0
CO2	96.3	3.0			100.0	3.0			100.0	3.0	63.0	0.0	2.3	94.4	3.0	3.0
CO3	96.3	3.0	100.0	3.0	100.0	3.0			100.0	3.0	63.0	0.0	2.4	94.4	3.0	3.0
CO4			100.0	3.0	100.0	3.0			100.0	3.0	63.0	0.0	2.3	94.4	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	63.0	0.0	2.3	94.4	3.0	3.0

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				H	2.76
CO2	H	2.7			H	2.7				
CO3	H	2.76							H	2.76
CO4	H	2.7							H	2.7
CO5	H	2.7			H	2.7				
AVERAGE OF COS FOR POS	2.724			2.76	2.7				2.74	

THIRD YEAR – I SEM

MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES:

COURSE TITLE: SOFTWARE TESTING AND QUALITYCOURSE
CODE: CS21501A
CREDITS: 4

DEPARTMENT: B. SC. COMPUTER SCIENCE AND ENGINEERING

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs :

- PO1. Scientific Knowledge. Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solvethe 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 substantiatedconclusions 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 tocomplex 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 towrite effective reports and documentation.
- PO8. Life-long learning: Recognize the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE):

- PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutionsto the real-world problems.
- PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking relatedconcepts of computer science and apply the knowledge in designing and building software solutions.
- PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and datamining of varying complexity.
- PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context ofchanging technologies.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Express** importance of testing in software development process, glass-box testing, black-box testing, and how to report and analyze bugs	II (Understand)
CO2	**Design** different types of test case	VI (Create)
CO3	**Organize** how to build testing strategy, establishing software testing methodology and software testing techniques.	VI (Create)
CO4	**Identify** the definition of quality, metrics for software quality and inspection techniques.	IV (Analyze)
CO5	**Explain** software configuration management, software reengineering and software restructuring techniques.	III (Apply)

TABLE 1: CO, PO, PSO MAPPING

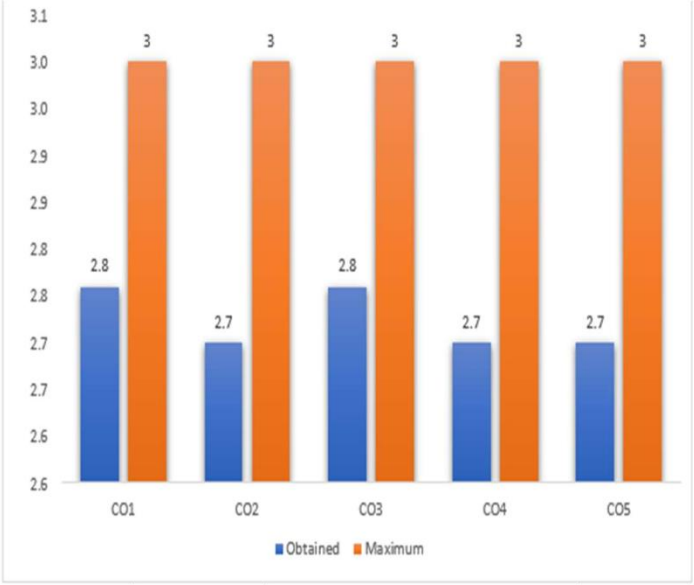
Course outcomes	Program Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	H		H					H	H		H		
2		H			H					H		H	
3				H		H					H		
4			H	H			H				H		
5		H						H		H			

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	96.3	3.0			100.0	3.0	100.0	3.0	100.0	3.0	37.0	0.0	2.4	100.0	3.0	3.0	2.8
CO2	96.3	3.0			100.0	3.0			100.0	3.0	37.0	0.0	2.3	100.0	3.0	3.0	2.7
CO3	96.3	3.0	100.0	3.0	100.0	3.0			100.0	3.0	37.0	0.0	2.4	100.0	3.0	3.0	2.8
CO4			100.0	3.0	100.0	3.0			100.0	3.0	37.0	0.0	2.3	100.0	3.0	3.0	2.7
CO5			100.0	3.0	100.0	3.0			100.0	3.0	37.0	0.0	2.3	100.0	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: PROGRAM 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					H 2.76
CO2		H 2.7			H 2.7			
CO3				H 2.76		H 2.76		
CO4			H 2.7	H 2.7			H 2.7	
CO5		H 2.7						H 2.7
AVERAGE OF COS FOR POS	2.76	2.7	2.73	2.73	2.7	2.76	2.7	2.73
AVERAGE OF POS	2.76	2.7	2.715	2.73	2.7	2.76	2.7	2.715
AVERAGE	2.7225							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: BIGDATA ANALYTICS
COURSE CODE: CS21501B
CREDITS: 3

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING

Program Outcomes – (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: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.

PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.

PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.

PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Explain** Bigdata Concepts and various Technologies to handle it	II (UNDERSTAND)
CO2	**Use** Hadoop Ecosystem and MapReduce to Reduce to process Bigdata	III(APPLY)
CO3	**Analyze** data Processing through Map Reduce	IV (ANALYZING)
CO4	**CHOOSE**YARN for Resource Management and HIVE for Data Storage	V(EVALUTING)
CO5	**Develop** PHP Programs and Database Connectivity through MYSQL	VI(CREATING)

Table 1: CO, PO, PSO MAPPING

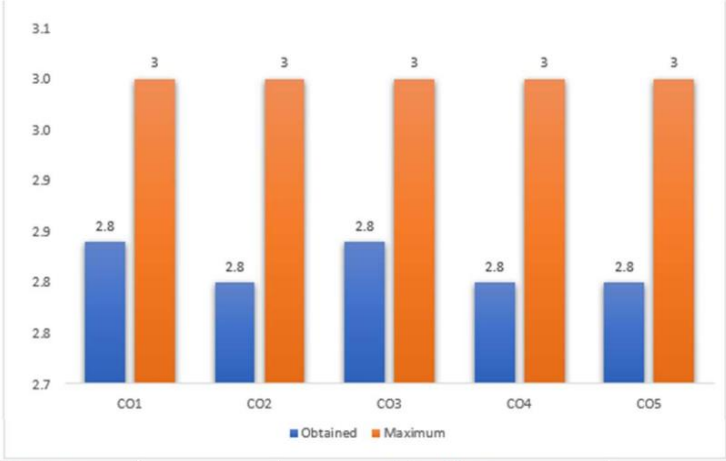
Course outcomes	Program Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1					H								
2			H										
3			H							H	H		
4	H			H					H				
5		H		H							H		

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	96.2	3.0			103.8	3.0	103.8	3.0	103.8	3.0	73.1	1.0	2.6	103.8	3.0	3.0	2.8
CO2	96.2	3.0			103.8	3.0			103.8	3.0	73.1	1.0	2.5	103.8	3.0	3.0	2.8
CO3	96.2	3.0	103.8	3.0	103.8	3.0			103.8	3.0	73.1	1.0	2.6	103.8	3.0	3.0	2.8
CO4			103.8	3.0	103.8	3.0			103.8	3.0	73.1	1.0	2.5	103.8	3.0	3.0	2.8
CO5			103.8	3.0	103.8	3.0			103.8	3.0	73.1	1.0	2.5	103.8	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: PROGRAM 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		2.81333	2.8
AVERAGE	2.814288889							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: OPERATIONS RESEARCH
COURSE CODE: BS18048
CREDITS: 4

DEPARTMENT: B. SC .COMPUTER SCEINCE AND ENGINEERING

PROGRAMME OUTCOMES: B. SC .COMPUTER SCEINCE AND ENGINEERING

- **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: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
- PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply theknowledge in designing and building software solutions.
- PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Construct** the simplex table and to plan the optimum results.	VI(CREATE)
CO2	**Use** the program for optimizing the cost involved in transportation problems	III (APPLY)
CO3	**Develop** and solve transformation models and assignment models	VI(CREATE)
CO4	**Explain** the methods used by organizations to obtain the right quantities of stock or inventory	II(UNDERSTANDING)
CO5	To **Define** basic characteristic features of a queuing system and acquire skills in analyzing queuing models.	I(REMEMBER)

TABLE 1: CO, PO, PSO MAPPING

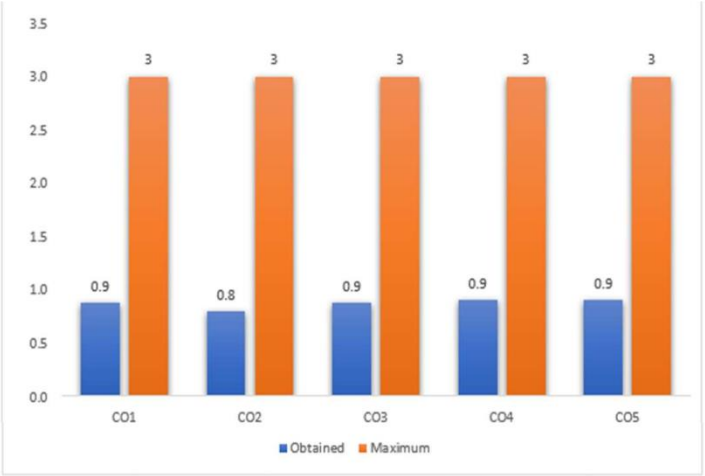
Course outcomes	Program Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1			H		H		H			H	H	H	
2	H	S		H		H				H	S	H	
3		H		H		S		H		H	S	H	
4	H		H					H		H	H	H	
5		H			H	H				H	H	H	

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	84.9	2.0			100.0	3.0	100.0	3.0	100.0	3.0	56.6	0.0	2.2	54.7	0.0	0.0	0.9
CO2	84.9	2.0			100.0	3.0			100.0	3.0	56.6	0.0	2.0	54.7	0.0	0.0	0.8
CO3	84.9	2.0	100.0	3.0	100.0	3.0			100.0	3.0	56.6	0.0	2.2	54.7	0.0	0.0	0.9
CO4			100.0	3.0	100.0	3.0			100.0	3.0	56.6	0.0	2.3	54.7	0.0	0.0	0.9
CO5			100.0	3.0	100.0	3.0			100.0	3.0	56.6	0.0	2.3	54.7	0.0	0.0	0.9

d

AVERAGE	AVERAGE
0	0.872

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							
CO2		H 2.7		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				
AVERAGE OF COS FOR POS	2.73	2.72		2.715				2.72
AVERAGE OF POS	2.715	2.72		2.715				2.72
AVERAGE	2.7175							

MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES:

COURSE TITLE: MOBILE APPLICATION DEVELOPMENT
COURSE CODE: CS21503
CREDITS: 4

DEPARTMENT: Computer Science and Engineering

Program Outcomes – (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: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real-world problems.**
- **PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts ofcomputer science and apply the knowledge in designing and building software solutions.**
- **PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining ofvarying complexity.**
- **PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.**

	COURSE OUTCOMES	**BLOOM'S TAXONOMY LEVEL**
CO1	**Compare** different mobile application models/architectures and patterns	II(UNDERSTAND)
CO2	**Apply** a mobile development framework to the development of a mobile application.	III (Apply)
CO3	**Examine** components and structure of a mobile development framework.	IV(Analyzing)
CO4	**Develop** advanced Java programming competency	VI (Create)
CO5	**Develop** Mobile Application using HTTP.	VI (Create)

Table 1: CO, PO, PSO MAPPING

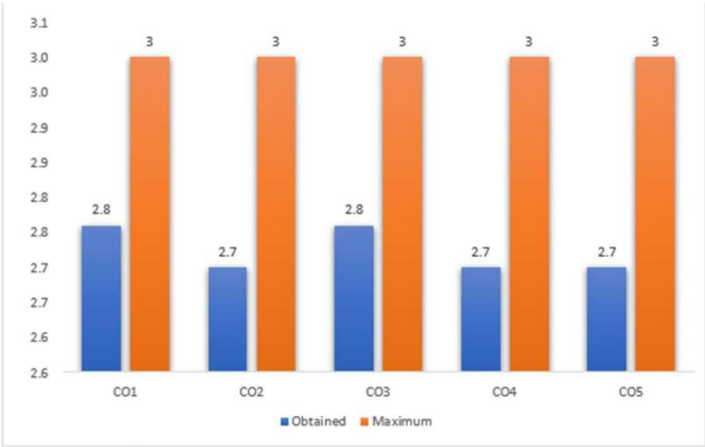
Course outcomes	Program Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1	H		H						H	H			
2	H	H		H					H		H		
3		H		H				H	H	H			
4		H		H					H		H		
5		H						H	H	H	H		

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	98.1	3.0			100.0	3.0	100.0	3.0	100.0	3.0	58.5	0.0	2.4	90.6	3.0	3.0	2.8
CO2	98.1	3.0			100.0	3.0			100.0	3.0	58.5	0.0	2.3	90.6	3.0	3.0	2.7
CO3	98.1	3.0	100.0	3.0	100.0	3.0			100.0	3.0	58.5	0.0	2.4	90.6	3.0	3.0	2.8
CO4			100.0	3.0	100.0	3.0			100.0	3.0	58.5	0.0	2.3	90.6	3.0	3.0	2.7
CO5			100.0	3.0	100.0	3.0			100.0	3.0	58.5	0.0	2.3	90.6	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				
CO3		H 2.76		H 2.76				H 2.76
CO4		H 2.7		H 2.7				
CO5		H 2.7						H 2.7
AVERAGE OF COS FOR POS	2.73	2.715	2.76	2.72				2.73
AVERAGE OF POS	2.715	2.715	2.76	2.72				2.73
AVERAGE	2.728							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: COMPUTER NETWORKS

COURSE CODE: BS18545

CREDITS: 4

DEPARTMENT: B. Sc. Computer Science and Engineering

Program Outcomes – (B. Sc. Computer Science and Engineering.)

- **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	**Identify** basic computer network topologies and protocols and explain Data Communication System components	III (APPLY)
CO2	**Classify** different error detecting techniques.	II(UNDERSTAND)
CO3	**Construct** sub-netting and routing mechanisms.	VI (CREATE)
CO4	**DESIGN** the routing protocols and analyze how to assign the IP addresses for the given network	VI (CREATE)
CO5	**Develop** Network Design and Implementation	III (APPLY)

Table 1: CO, PO, PSO MAPPING

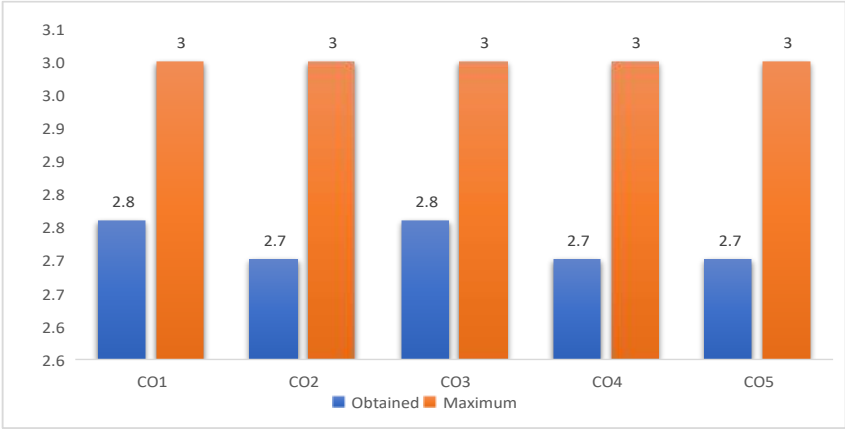
Course outcomes	Program Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	S		H	H	S		S	H	S	S		S	
2	S		S	H		S	S	S	H	H		H	
3	H		H	H		S	H	S	S	H		H	
4	S		S	H		S	S	H		H	S	H	
5	H		H	H	S		S	S		S		S	

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 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	51.9	0.0	2.4	98.1	3.0	3.0	2.8
CO2	100.0	3.0			100.0	3.0			100.0	3.0	51.9	0.0	2.3	98.1	3.0	3.0	2.7
CO3	100.0	3.0	94.4	3.0	100.0	3.0			100.0	3.0	51.9	0.0	2.4	98.1	3.0	3.0	2.8
CO4			94.4	3.0	100.0	3.0			100.0	3.0	51.9	0.0	2.3	98.1	3.0	3.0	2.7
CO5			94.4	3.0	100.0	3.0			100.0	3.0	51.9	0.0	2.3	98.1	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
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	2.76		2.72	2.715				2.715
AVERAGE OF POS	2.76		2.72	2.715				2.70375
AVERAGE	2.7246875							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: ADVANCED JAVA
COURSE CODE: CS18502
CREDITS: 4

DEPARTMENT: B.SC. COMPUTER SCIENCE AND ENGINEERING

PROGRAMME OUTCOMES(BSC) :BSc. Computer Science and Engineering

- 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 thatmeet 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 conclusionsusing 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 scienceand 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 effectivereports and documentation.
- PO8. Life-long learning: Recognize the need and ability to engage in independent and lifelong learning in the context of technologicalchange.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE):

- PSO1: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real-world problems.
- PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Select** appropriate data structures for real world problems	IV (APPLYING)
CO2	**Develop** component-based applications using JavaBeans and well-formed XML document.	VI (CREATE)
CO3	**Develop** client/server applications using Servlets and JSP.	VI (Create)
CO4	**Use** SQL to obtain data from data bases	III (Apply)
CO5	**Identify** the type of socket used for connection and implement TCP/IP socket programming.	IV (Analyze)

TABLE 1: CO, PO, PSO MAPPING

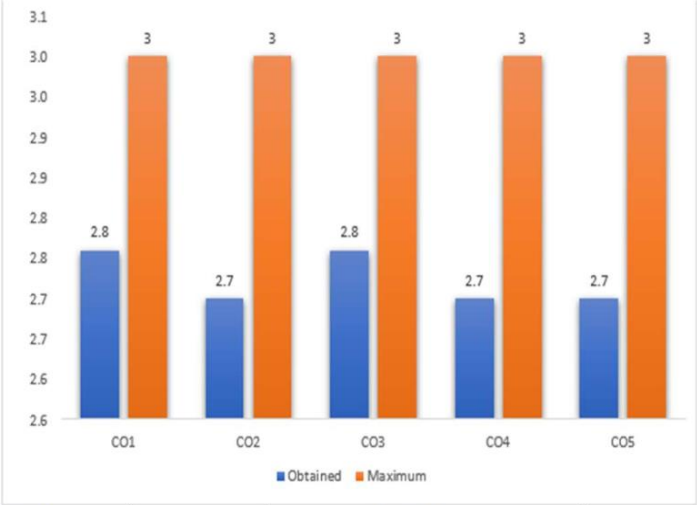
Course outcomes	Program Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	H			H					H	H			
2		H		H				H	H				
3		H		H				H			H		
4	H			H				H	H				
5		H		H						H	H		

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	88.7	3.0			100.0	3.0	100.0	3.0	100.0	3.0	52.8	0.0	2.4	100.0	3.0	3.0	2.8
CO2	88.7	3.0			100.0	3.0			100.0	3.0	52.8	0.0	2.3	100.0	3.0	3.0	2.7
CO3	88.7	3.0	98.1	3.0	100.0	3.0			100.0	3.0	52.8	0.0	2.4	100.0	3.0	3.0	2.8
CO4			98.1	3.0	100.0	3.0			100.0	3.0	52.8	0.0	2.3	100.0	3.0	3.0	2.7
CO5			98.1	3.0	100.0	3.0			100.0	3.0	52.8	0.0	2.3	100.0	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							
CO2		H 2.7		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				
AVERAGE OF COS FOR POS	2.73	2.72		2.715				2.72
AVERAGE OF POS	2.715	2.72		2.715				2.72
AVERAGE	2.7175							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: Web Technologies
CREDITS: 3
COURSE CODE:CS21504

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

Programme Outcomes – (B. Sc. Computer Science & Engineering)

- **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):

- **PSO1:** Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Illustrate** basic html scripts to design web pages	II (Understand)
CO2	**Explain** about cascading style sheets	III (Apply)
CO3	**Analyze** java script programming using operators, expressions, functions	IV (Analyze)
CO4	**Classify** event handling in java script and introduction to xml	IV (Analyze)
CO5	**Develop** PHP programs and database connectivity through mysql	VI (Create)

Table 1: CO, PO, PSO MAPPING

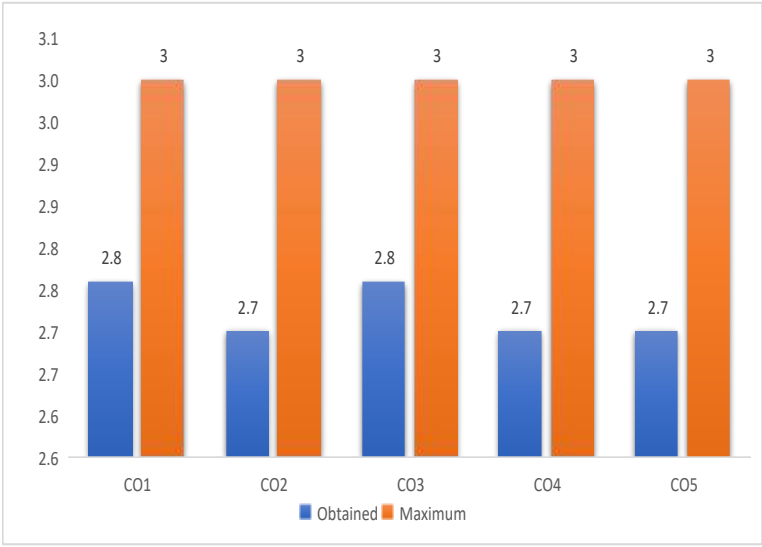
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H		H	S			S	S		S		H
C02	H		H	H			H	S		H		H
C03	H		H	H	H		H	S		H		H
C04	H		H	H	S		H	S		H		S
C05	H		H	H	S		S	H		H		H

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	142.1	3.0			142.1	3.0	142.1	3.0	142.1	3.0	63.2	0.0	2.4	142.1	3.0	3.0	2.8
CO2	142.1	3.0			142.1	3.0			142.1	3.0	63.2	0.0	2.3	142.1	3.0	3.0	2.7
CO3	142.1	3.0	142.1	3.0	142.1	3.0			142.1	3.0	63.2	0.0	2.4	142.1	3.0	3.0	2.8
CO4			142.1	3.0	142.1	3.0			142.1	3.0	63.2	0.0	2.3	142.1	3.0	3.0	2.7
CO5			142.1	3.0	142.1	3.0			142.1	3.0	63.2	0.0	2.3	142.1	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

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							

THIRD YEAR – II SEM

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: ECOMMERCE
COURSE CODE: CS18601A
CREDITS: 4

DEPARTMENT: B.SC. COMPUTER SCIENCE AND ENGINEERING

PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs :BSc. Computer Science And Engineering

- 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 thatmeet 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 conclusionsusing 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 scienceand 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 activitieswith society at large and able to write effectivereports and documentation.
- PO8. Life-long learning: Recognise the need and ability to engage in independent and lifelong learning in the context of technologicalchange.

PROGRAMME SPECIFIC OUTCOME (DEPARTMENT WISE):B.Sc. Computer Science Engineering.Students will be able to:

- PSO1: Apply computer science programming languages and algorithms, as well as mathematical,physics models for developing solutions to the real worldproblems
- PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computerscience and apply the knowledge in designing and building software solutions.
- PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varyingcomplexity.
- PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

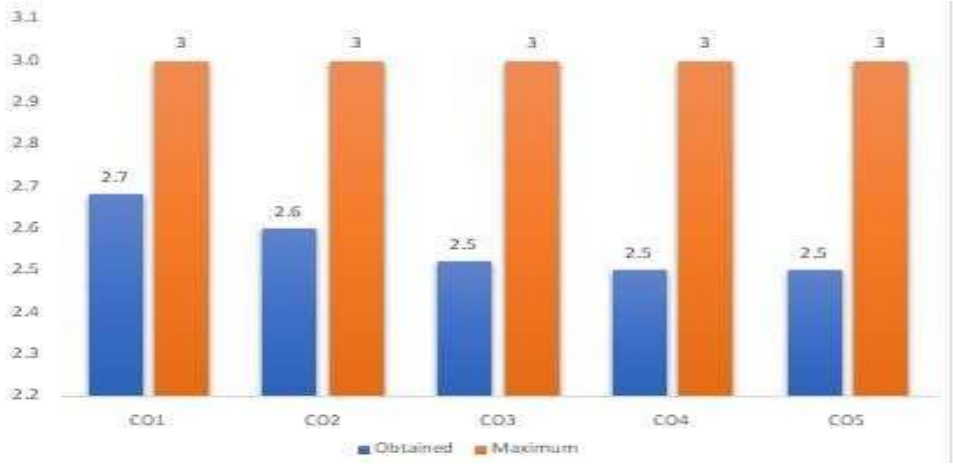
TABLE 1: CO, PO, PSO MAPPING

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



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	79.2	2.0			96.2	3.0	100.0	3.0	100.0	3.0	35.8	0.0	2.2	100.0	3.0	3.0	2.7
CO2	79.2	2.0			96.2	3.0			100.0	3.0	35.8	0.0	2.0	100.0	3.0	3.0	2.6
CO3	79.2	2.0	67.9	1.0	96.2	3.0			100.0	3.0	35.8	0.0	1.8	100.0	3.0	3.0	2.5
CO4			67.9	1.0	96.2	3.0			100.0	3.0	35.8	0.0	1.8	100.0	3.0	3.0	2.5
CO5			67.9	1.0	96.2	3.0			100.0	3.0	35.8	0.0	1.8	100.0	3.0	3.0	2.5

AVERAGE	AVERAGE
3	2.56

Table 3: PROGRAMME OUTCOME MAPPING

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			H 2.6	
CO3	H 2.52		H 2.52	H 2.52	H 2.52		H 2.52	
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	2.56		2.56	2.53	2.52		2.54	2.5
AVERAGE OF POS	2.536		2.536	2.53	2.52		2.54	2.5
AVERAGE	2.527							

MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES:

COURSE TITLE: DATA MINING
COURSE CODE: CS21602B
CREDITS: 4

DEPARTMENT: B.Sc. Computer Science and Engineering

Programme Outcomes – (B. Sc. Computer Science and Engineering)

- **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:Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the realworld problems.

PSO2: Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts ofcomputer science and apply the knowledge in designing and building software solutions.

PSO3: Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining ofvarying complexity.

PSO4: Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

	COURSE OUTCOMES	**BLOOM'S TAXONOMY LEVEL**
CO1	Demonstrate an understanding of the importance of data mining and its related areas.	IV (Analyze)
CO2	Organize and prepare the data needed for data mining using pre-processing techniques	III (Apply)
CO3	Perform exploratory analysis of the data to be used for mining.	II (Understand)
CO4	Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on large data sets. .	VI (Create)
CO5	Define and apply metrics to measure the performance of various data mining algorithms	VI (Remembering)

Table 1: CO, PO, PSO MAPPING

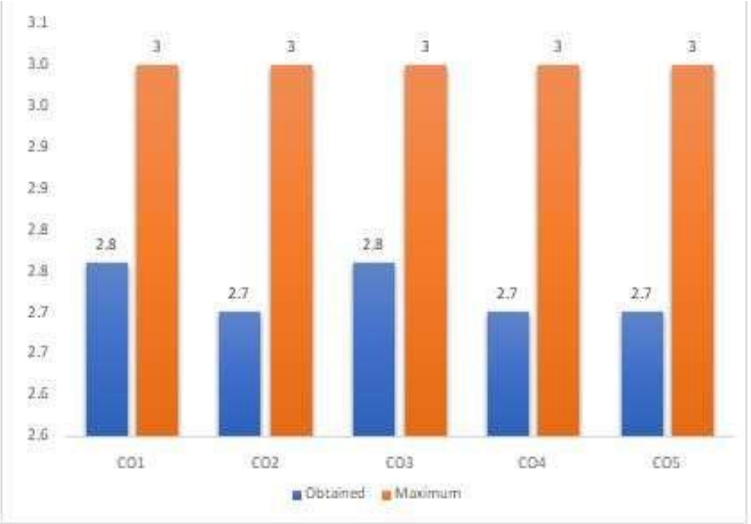
Course outcomes	Programme Outcomes								Program Specificoutcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1		H	H							H	H		
2	H	H		H					H				
3	H				H			H					
4			H	H									
5					H		H					H	

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%= 1Pass 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	44.4	0.0	2.4	92.6	3.0	3.0	2.8
CO2	100.0	3.0			100.0	3.0			100.0	3.0	44.4	0.0	2.3	92.6	3.0	3.0	2.7
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	44.4	0.0	2.4	92.6	3.0	3.0	2.8
CO4			100.0	3.0	100.0	3.0			100.0	3.0	44.4	0.0	2.3	92.6	3.0	3.0	2.7
CO5			100.0	3.0	100.0	3.0			100.0	3.0	44.4	0.0	2.3	92.6	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				
CO3	H 2.76				H 2.76			H 2.76
CO4			H 2.7	H 2.7				
CO5					H 2.7		H 2.7	
AVERAGE OF COS FOR POS	2.73	2.73	2.73	2.7	2.73		2.7	2.76
AVERAGE OF POS	2.73	2.715	2.715	2.7	2.73		2.7	2.76
AVERAGE	2.721428571							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: CLOUD COMPUTING
COURSE CODE:CS18602A
CREDITS: 4

DEPARTMENT: B.SC. COMPUTER SCIENCE AND ENGINEERING

Programme Outcomes – (B. Sc. Computer Science and Engineering)

- **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 OUTCOME (DEPARTMENT WISE):

- **PSO1**: Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real-world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

TABLE 1: CO, PO, PSO MAPPING

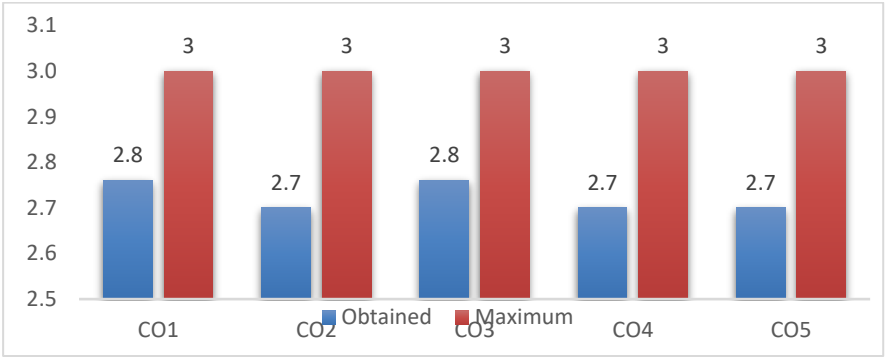
Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9	Column10	Column11	Column12	Column13
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	**H**		H					H	S			
C02	**H**			H					S			
C03	**H**							H	S			
C04	**H**							H	S			
C05	**H**			H					S			

H: Highly SupportiveS: 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	92.6	3.0			100.0	3.0	100.0	3.0	100.0	3.0	33.3	0.0	2.4	88.9	3.0	3.0	2.8
CO2	92.6	3.0			100.0	3.0			100.0	3.0	33.3	0.0	2.3	88.9	3.0	3.0	2.7
CO3	92.6	3.0	100.0	3.0	100.0	3.0			100.0	3.0	33.3	0.0	2.4	88.9	3.0	3.0	2.8
CO4			100.0	3.0	100.0	3.0			100.0	3.0	33.3	0.0	2.3	88.9	3.0	3.0	2.7
CO5			100.0	3.0	100.0	3.0			100.0	3.0	33.3	0.0	2.3	88.9	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	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							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: PRINCIPLES OF INFORMATION SECURITY
CREDITS: 4
COURSE CODE: CS18601B

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

Programme Outcomes – (B. Sc. Computer Science and Engineering)

- **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):

- **PSO1:** Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyze computer programs in the areas related to networking, web designing, cloud computing, and data mining o varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Explain** concepts of confidentiality, availability and integrity (CIA) in context of Information security	II (UNDERSTAND)
CO2	**Identify** the risk, assess and risk control strategies	II(UNDERSTAND)
CO3	**Demonstrate** expertise in configuring host and network level technical security controls to include host firewalls, user access controls, host logging, network filtering, intrusion detection and prevention	III (APPLY)
CO4	**Analyze** systems, tools, methods, and techniques for securing digital information within an organization	VI (ANALYZE)
CO5	**Develop** encryption and decryption techniques	IV(CREATE)

Table 1: CO, PO, PSO MAPPING

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H			H			H	S		H	H	
C02		H				H		H	H		H	
C03	H		H		H	H		H		H		S
C04	H	S										H
C05	H		H	H	S	H				H	S	

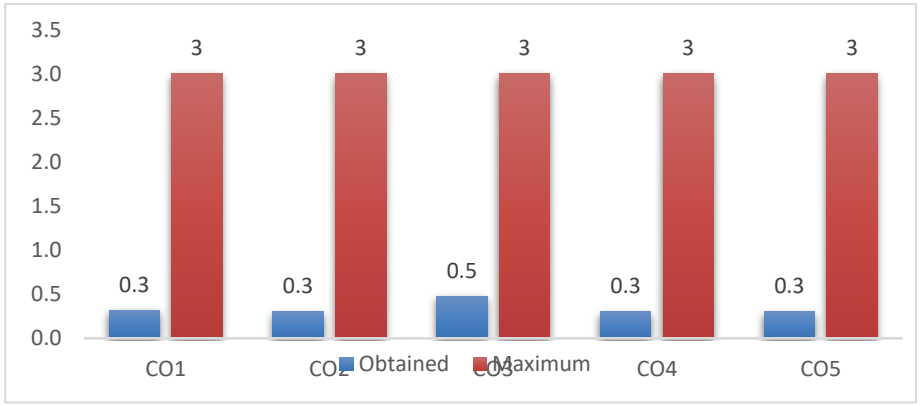
H: Highly Supportive

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 perceof 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	92.6	3.0			100.0	3.0	100.0	3.0	100.0	3.0	33.3	0.0	2.4	88.9	3.0	3.0	2.8
CO2	92.6	3.0			100.0	3.0			100.0	3.0	33.3	0.0	2.3	88.9	3.0	3.0	2.7
CO3	92.6	3.0	100.0	3.0	100.0	3.0			100.0	3.0	33.3	0.0	2.4	88.9	3.0	3.0	2.8
CO4			100.0	3.0	100.0	3.0			100.0	3.0	33.3	0.0	2.3	88.9	3.0	3.0	2.7
CO5			100.0	3.0	100.0	3.0			100.0	3.0	33.3	0.0	2.3	88.9	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 examare 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	PO 2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.84			H 2.84			H 2.84	
CO2		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							
CO5	H 2.8		H 2.8	H 2.8		H 2.8		
AVERAGE OF COS FORPOS	2.82	2.8	2.82	2.82	2.84	2.813333333	2.84	2.82
AVERAGE OF POS	2.815	2.8	2.82	2.81	2.84	2.813333	2.84	2.82
AVERAGE	2.819791667							

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: PYTHON PROGRAMMING
CREDITS: 4
COURSE CODE: BS21604

DEPARTMENT: B. Sc. COMPUTER SCIENCE & ENGINEERING

Program Outcomes – (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):

- **PSO1:** Apply computer science programming languages and algorithms, as well as mathematical, physics models for developing solutions to the real-world problems.
- **PSO2:** Demonstrate the fundamentals of Computer Organization, Operating Systems, Computer Programming and Networking related concepts of computer science and apply the knowledge in designing and building software solutions.
- **PSO3:** Identify, formulate and analyse computer programs in the areas related to networking, web designing, cloud computing, and data mining of varying complexity.
- **PSO4:** Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**Demonstrate** basic programming techniques.	II (UNDERSTAND)
CO2	**Apply** concepts of functions, sequences, dictionaries	II (APPLY)
CO3	**Appraise** how to implement modules, files, exceptions	III (UNDERSTAND)
CO4	**Create** object-oriented programming	VI (ANALYZE)
CO5	**Explain** GUI programming, database and network programming	IV (UNDERSTAND)

Table 1: CO, PO, PSO MAPPING

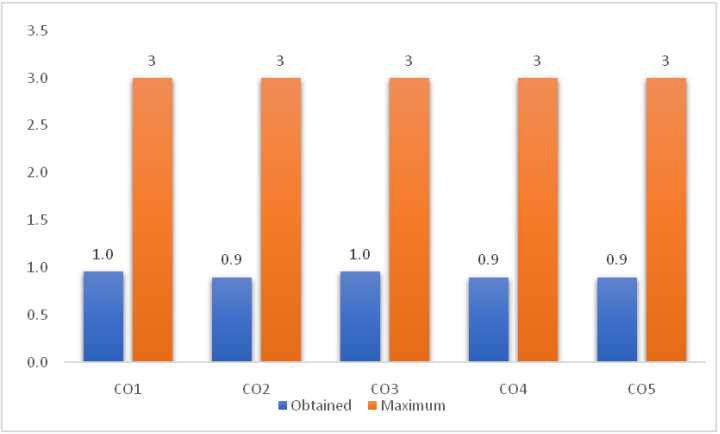
Course outcomes	Program Outcomes								Program Specific outcomes				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P08**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	
1	**H**			**H**			**H**	**S**		**H**	**H**		
2		**H**				**H**		**H**	**H**		**H**		
3	**H**		**H**		**H**	**H**		**H**		**H**		**S**	
4	**H**	**S**										**H**	
5	**H**		**H**	**H**	**S**	**H**				**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 average	pass%	Attainment level	co wise external average	co wise total average
CO1	92.6	3.0			100.0	3.0	100.0	3.0	100.0	3.0	33.3	0.0	2.4	88.9	3.0	3.0	2.8
CO2	92.6	3.0			100.0	3.0			100.0	3.0	33.3	0.0	2.3	88.9	3.0	3.0	2.7
CO3	92.6	3.0	100.0	3.0	100.0	3.0			100.0	3.0	33.3	0.0	2.4	88.9	3.0	3.0	2.8
CO4			100.0	3.0	100.0	3.0			100.0	3.0	33.3	0.0	2.3	88.9	3.0	3.0	2.7
CO5			100.0	3.0	100.0	3.0			100.0	3.0	33.3	0.0	2.3	88.9	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

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							