

## COURSEOUTCOMEMAPPING

### MAPPINGCOURSEOUTCOMESLEADINGTO THEATTAINMENT OFPROGRAM OUTCOMES

**COURSE TITLE: GENERAL ENGLISH I**

**COURSECODE: EN18101**

**CREDITS:3**

**DEPARTMENT:B.Sc. COMPUTER SCIENCE&COGNITIVE SYSTEMS**

#### **ProgrammeOutcomes– (B. Sc.)**

B.Sc.:

- **PO1.** Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2.** Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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):**

**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.



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

**H: Highly Supportive**

**S: Supportive**

**Table2: COURSEOUTCOME ATTAINMENT**

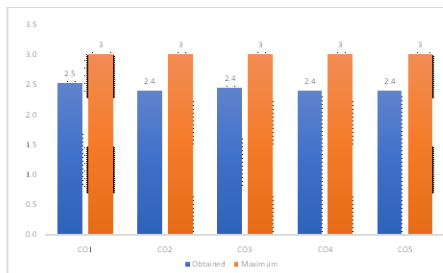
**ATTAINMENT SCALE:**

**Pass percent of 85% and above= 3**

**Passpercentbetween75%-85%= 2**

**Passpercentbetween75%-65%=1**

**Pass percent of less than 65%= 0**



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		co wise external average	co wise total average		
CO1	77.6	2.0			85.7	3.0	100.0	3.0	73.5	1.0	53.1	0.0	1.8	98.0	3.0	3.0	2.5
CO2	<b>77.6</b>	<b>2.0</b>			<b>85.7</b>	<b>3.0</b>			<b>73.5</b>	<b>1.0</b>	<b>53.1</b>	<b>0.0</b>	<b>1.5</b>	<b>98.0</b>	<b>3.0</b>	<b>3.0</b>	<b>2.4</b>
CO3	77.6	2.0	81.6	2.0	85.7	3.0			73.5	1.0	53.1	0.0	1.6	98.0	3.0	3.0	2.4
CO4			<b>81.6</b>	<b>2.0</b>	<b>85.7</b>	<b>3.0</b>			<b>73.5</b>	<b>1.0</b>	<b>53.1</b>	<b>0.0</b>	<b>1.5</b>	<b>98.0</b>	<b>3.0</b>	<b>3.0</b>	<b>2.4</b>
CO5			81.6	2.0	85.7	3.0			73.5	1.0	53.1	0.0	1.5	98.0	3.0	3.0	2.4

AVERAGE	AVERAGE
3	<b>2.432</b>

**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 midsemester exam needs to improve to improve overall course outcome attainment level.

**Table 3: PROGRAMME OUTCOME MAPPING**

**Instruction:**

1. Copy the completed table 1.
2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]
3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.52	H 2.52	H 2.52					
CO2	H 2.4		H 2.4	H 2.4		H 2.4	H 2.4	
CO3	H 2.44		H 2.44	H 2.44	H 2.44		H 2.44	H 2.44
CO4	H 2.4		H 2.4	H 2.4		H 2.4	H 2.4	
CO5	H 2.4	H 2.4	H 2.4	H 2.4				H 2.4
AVERAGE OF COS FOR POS	2.432	2.46	2.432	2.41	2.44	2.4	2.413333333	2.42
AVERAGE OF POS	2.4144	2.43	2.4144	2.41	2.44	2.4	2.413333	2.42
AVERAGE	2.417766667							

## **COURSEOUTCOMEMAPPING**

### **MAPPINGCOURSEOUTCOMESLEADINGTO THEATTAINMENT OFPROGRAM OUTCOMES**

**COURSE TITLE: VALUE EDUCATION & PERSONALITY DEVELOPMENT**

**COURSE CODE: VE18101**

**CREDITS: 2**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### **Programme 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 public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.** Problem Analysis: Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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- **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):**

**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.



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

**H: Highly Supportive**

**S: Supportive**

**Table2: COURSE OUTCOME ATTAINMENT**

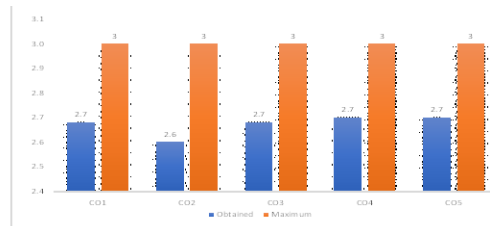
**ATTAINMENT SCALE:**

**Pass percent of 85% and above= 3**

**Pass percent between 75%-85%= 2**

**Pass percent between 65%-75%= 1**

**Pass percent of less than 65%= 0**



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	co wise total average
CO1	75.5	2.0			100.0	3.0	100.0	3.0	100.0	3.0	53.1	0.0	2.2	95.9	3.0	3.0	2.7
CO2	75.5	2.0			100.0	3.0			100.0	3.0	53.1	0.0	2.0	95.9	3.0	3.0	2.6
CO3	75.5	2.0	85.7	3.0	100.0	3.0			100.0	3.0	53.1	0.0	2.2	95.9	3.0	3.0	2.7
CO4			85.7	3.0	100.0	3.0			100.0	3.0	53.1	0.0	2.3	95.9	3.0	3.0	2.7
CO5			85.7	3.0	100.0	3.0			100.0	3.0	53.1	0.0	2.3	95.9	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.672

**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.

**Table3: PROGRAMMEOUTCOME MAPPING**

**Instruction:**

1. Copy the completed table 1.
2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]
3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]



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

## COURSEOUTCOMEMAPPING

### MAPPINGCOURSEOUTCOMESLEADINGTO THEATTAINMENT OFPROGRAM OUTCOMES

**COURSE TITLE: INTRODUCTION TO WORK SHEETS**

**COURSE CODE: CSC23101**

**CREDITS:4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### **Programme 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 public health and safety, and the cultural, societal, and environmental considerations.
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**PROGRAMMESPECIFICOUTCOMES(DEPARTMENTAL):**

**Studentswill be ableto:**

**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.

	<b>COURSEOUTCOMES</b>	<b>BLOOM'STAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1: Explain</b> the concepts of MS-Excel	VI(CREATE)
<b>CO2</b>	<b>CO2: Understand</b> basic concepts of VBA	II (UNDERSTAND)
<b>CO3</b>	<b>CO3: Develop</b> basic programming using VBA	VI(CREATE)
<b>CO4</b>	<b>CO4: Divide</b> large programs into functions and create user forms	IV(ANALYZE)
<b>CO5</b>	<b>CO5: Create</b> charts using VBA code	VI(CREATE)

**Table1: CO, PO, PSO MAPPING**

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	
1	H	H		H	H		S	H	S	H		H	
2	H	H	H	H	S	H	H	S		H		H	
3		S	H		H						H		
4	S	H	S		H		H	H	H	S	S		
5	H		H		H		H		H			H	

**H: Highly Supportive**

**S: Supportive**



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

**Table3: PROGRAMME OUTCOME MAPPING**

**Instruction:**

1. Copy the completed table 1.
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OUTCOME	PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8	
CO1	H	2.84	H	2.84			H	2.84	H	2.84					H	2.84
CO2	H	2.8	H	2.8	H	2.8	H	2.8			H	2.8	H	2.8		
CO3					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	2.813333333		2.813333333		2.813333333		2.82		2.82		2.8		2.8		2.82	
AVERAGE OF POS	2.804444		2.804444		2.813333		2.81		2.815		2.8		2.8		2.81	
AVERAGE	2.807152778															

## COURSE OUTCOME MAPPING

### MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

**COURSE TITLE: OPERATING SYSTEMS**

**COURSE CODE: CSC23102**

**CREDITS: 4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### Programme Outcomes – (B. Sc.)

##### B. Sc.:

- **PO1. Scientific Knowledge:** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental

considerations.

- **PO3.Problemanalysis:**Identify,formulate,researchliterature,andanalyzecomplexscientificproblemsreachingsubstantiatedconclusions using first principles of mathematics, natural sciences, and engineering sciences.
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- **PO5.Environmentandsustainability:**Understandtheimpactofprofessionalscienceandtechnologicalsolutionsinsocietaland environmental contexts and for sustainable development.
- **PO6.Individualandteam work:** Functionobjectively asanindividual andasa memberindiverse teams.
- **PO7.Communication:**Communicateeffectivelyoncomplexscience&technologyactivitieswithsocietyatlargeandabletowriteeffective reports and documentation.
- **PO8.Life-longlearning:**Recognisetheneedandabilitytoengageindependentandlifelonglearninginthecontextoftechnological change.

#### **PROGRAMMESPECIFICOUTCOMES(DEPARTMENTAL):**

##### **Studentswill be ableto:**

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- PSO3.** Use emerging technologies and computing concepts.
- PSO4.** Apply mathematical, computational, and statistical tools to detect patterns and model performance.

	<b>COURSEOUTCOMES</b>	<b>BLOOM'STAXONOMY LEVEL</b>
<b>CO1</b>	<b>Explain</b> functions, types and structures of operating system	II (UNDERSTAND)
<b>CO2</b>	<b>Analyze</b> various process management concepts including scheduling and synchronization	IV(ANALYZE)
<b>CO3</b>	<b>Illustrate</b> the concepts of memory management and I/O system	IV(ANALYZE)
<b>CO4</b>	<b>Solve</b> issues related to file system interface.	III (APPLY)
<b>CO5</b>	<b>Choose</b> an appropriate Page replacement algorithm	IV(ANALYZE)

**Table1: CO, PO, PSO MAPPING**

Course outcomes	Programme Outcomes								ProgramSpecific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	
1	H		S	H	S		S		S	H	H	S	

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

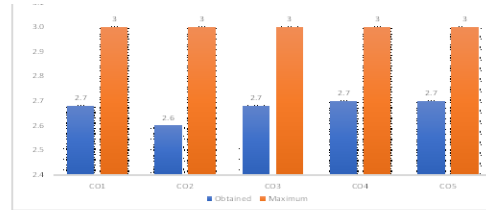
**H: Highly Supportive**

**S: Supportive**

**Table2: COURSE OUTCOME ATTAINMENT**

**ATTAINMENT SCALE:**

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



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	co wise total average
CO1	75.5	2.0			100.0	3.0	100.0	3.0	100.0	3.0	53.1	0.0	2.2	91.8	3.0	3.0	2.7
CO2	75.5	<b>2.0</b>			<b>100.0</b>	<b>3.0</b>			<b>100.0</b>	<b>3.0</b>	<b>53.1</b>	<b>0.0</b>	<b>2.0</b>	<b>91.8</b>	<b>3.0</b>	<b>3.0</b>	<b>2.6</b>
CO3	75.5	2.0	85.7	3.0	100.0	3.0			100.0	3.0	53.1	0.0	2.2	91.8	3.0	3.0	2.7
CO4			<b>85.7</b>	<b>3.0</b>	<b>100.0</b>	<b>3.0</b>			<b>100.0</b>	<b>3.0</b>	<b>53.1</b>	<b>0.0</b>	<b>2.3</b>	<b>91.8</b>	<b>3.0</b>	<b>3.0</b>	<b>2.7</b>
CO5			85.7	3.0	100.0	3.0			100.0	3.0	53.1	0.0	2.3	91.8	3.0	3.0	2.7

AVERAGE	AVERAGE
<b>3</b>	<b>2.672</b>

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

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OUTCOME	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO1			H 3					
CO2	H 3			H 3			H 3	
CO3	H 3		H 3	H 3	H 3	H 3		H 3
CO4				H 3			H 3	
CO5	H 3		H 3	H 3				H 3
AVERAGE OF COS FOR POS	3		3	3	3	3	3	3
AVERAGE OF POS	3		3	3	3	3	3	3
AVERAGE	3							

## COURSE OUTCOME MAPPING

### MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

**COURSE TITLE: COMPUTER FUNDAMENTALS**

**COURSE CODE: CSC20103**

**CREDITS: 4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### Programme Outcomes – (B. Sc.)

##### B. Sc.:

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#### **PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**

##### **Students will be able to:**

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	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1:</b> Understand various I/O devices and functionality of computer.	II (UNDERSTAND)
<b>CO2</b>	<b>CO2:</b> Understand types of memory and software	II (UNDERSTAND)
<b>CO3</b>	<b>CO3:</b> Solve arithmetic operations using different types of number systems	III (APPLY)
<b>CO4</b>	<b>CO4:</b> Distinguish different types of networks, networking devices and topologies.	IV (ANALYZE)
<b>CO5</b>	<b>CO5:</b> Explain various IP addressing mechanisms.	II (UNDERSTAND)

**Table 1: CO, PO, PSO MAPPING**

<b>Course outcomes</b>	<b>Programme Outcomes</b>								<b>Program Specific outcomes</b>				
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	
1	H	H		H	H		H	H	S	H		H	

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

**H: Highly Supportive**

**S: Supportive**

**Table2: COURSE OUTCOME ATTAINMENT**

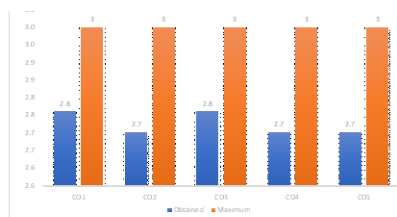
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Pass percent between 75%-85%= 2

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Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam		co wise total average	
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level		co wise external average
CO1	87.8	3.0			100.0	3.0	98.0	3.0	100.0	3.0	63.3	0.0	2.4	95.9	3.0	3.0	2.8
CO2	87.8	3.0			100.0	3.0			100.0	3.0	63.3	0.0	2.3	95.9	3.0	3.0	2.7
CO3	87.8	3.0	89.8	3.0	100.0	3.0			100.0	3.0	63.3	0.0	2.4	95.9	3.0	3.0	2.8
CO4			89.8	3.0	100.0	3.0			100.0	3.0	63.3	0.0	2.3	95.9	3.0	3.0	2.7
CO5			89.8	3.0	100.0	3.0			100.0	3.0	63.3	0.0	2.3	95.9	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

**RESULT ANALYSIS: (Only write 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.

**Table3: PROGRAMMEOUTCOME MAPPING**

**Instruction:**

1. Copythe completedtable1.
2. RetainonlythePOsandtheHighlysupportive(H)points. [DeletethePSOcolumnsandthe‘S’points]
3. Writetherespective CO-wisetotalaverage (columnK intable2) wherevereachCO ismapped as(H)under eachPO.]



OUTCOM E	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.76	H 2.76		H 2.76	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		
CO4	H 2.7	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	
AVERAGEOF COSFOR POS	2.72	2.72	2.72	2.74	2.7	2.73	2.7	2.73
AVERAGEOF POS	2.70666 7	2.70666 7	2.72	2.73333 3	2.73333 3	2.73	2.7	2.715
AVERAG E	2.71812 5							

## **COURSE OUTCOME MAPPING**

### **MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES**

**COURSE TITLE: PROBLEM SOLVING AND PROGRAMMING IN C**

**COURSE CODE: CSC20104**

**CREDITS: 4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### **Programme Outcomes – (B. Sc.)**

##### **B. Sc.:**

- **PO1. Scientific Knowledge:** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamental 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.Problemanalysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4.Moderntoolusage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5.Environmentandsustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individualandteam 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-longlearning:** 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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1:</b> Explain the basic introduction of C programming languages.	II (UNDERSTAND)
<b>CO2</b>	<b>CO2:</b> Categorized different data types, operators and data input/output functions in C.	VI (CREATE)
<b>CO3</b>	<b>CO3:</b> Develop programs using C control structures, arrays and string concept	VI (CREATE)
<b>CO4</b>	<b>CO4:</b> Analyse larger problems into smaller ones using C functions.	IV (ANALYZE)
<b>CO5</b>	<b>CO5:</b> Create programs using the concept of structures, union and file handling in C.	VI (CREATE)

**Table1: CO, PO, PSO MAPPING**

<b>Course outcomes</b>	<b>Programme Outcomes</b>								<b>Program Specific outcomes</b>				
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	
1	H	H		H	H			H	S	H		H	

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

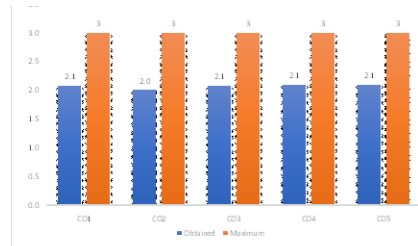
**H: Highly Supportive**

**S: Supportive**

**Table2: COURSE OUTCOME ATTAINMENT**

**ATTAINMENT SCALE:**

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



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		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	75.5	2.0			100.0	3.0	100.0	3.0	100.0	3.0	53.1	0.0	2.2	79.6	2.0	2.0	2.1
CO2	75.5	2.0			100.0	3.0			100.0	3.0	53.1	0.0	2.0	79.6	2.0	2.0	2.0
CO3	75.5	2.0			100.0	3.0			100.0	3.0	53.1	0.0	2.2	79.6	2.0	2.0	2.1
CO4			85.7	3.0	100.0	3.0			100.0	3.0	53.1	0.0	2.3	79.6	2.0	2.0	2.1
CO5			85.7	3.0	100.0	3.0			100.0	3.0	53.1	0.0	2.3	79.6	2.0	2.0	2.1

AVERAGE	AVERAGE
2	2.072

**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 midsemester exam needs to improve to improve overall course outcome attainment level.

**Table3: PROGRAMMEOUTCOME MAPPING**

**Instruction:**

- 1. Copythe completedtable1.**
- 2. RetainonlythePOsandtheHighlysupportive(H)points. [DeletethePSOcolumnsandthe‘S’points]**
- 3. Writetherespective CO-wisetotalaverage (columnK intable2) wherevereachCO ismapped as(H)under eachPO.]**



OUTCOM E	PO 1	PO2	PO 3	PO 4	PO5	PO6	PO7	PO8
CO1	H 2.92	H 2.92		H 2.92	H 2.92			H 2.92
CO2		H 2.9		H 2.9		H 2.9		
CO3	H 2.92			H 2.92	H 2.92			
CO4		H 2.9			H 2.9	H 2.9	H 2.9	H 2.9
CO5	H 2.9		H 2.9		H 2.9		H 2.9	H 2.9
AVERAGEOF COSFOR POS	2.913333333	2.906666667	2.9	2.913333333	2.91	2.9	2.9	2.906666667
AVERAGEOF POS	2.91111 1	2.90222 2	2.9	2.91111 1	2.9075	2.9	2.9	2.90222 2
AVERA GE	2.90427083 3							

**COURSEOUTCOMEMAPPING**

**MAPPINGCOURSEOUTCOMESLEADINGTO THEATTAINMENT OFPROGRAM OUTCOMES**

**COURSE TITLE: ENVIRONMENTAL STUDIES AND GENDER SENSITIZATION**

**COURSE CODE: ES18101**

**CREDITS: 3**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

**Programme Outcomes – (B. Sc.)**

**B. Sc.:**

- **PO1.Scientific Knowledge:** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamental 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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1:</b> Understand the importance of environmental education, conservation of natural resources & understand the importance of ecosystems and biodiversity	II (UNDERSTAND)
<b>CO2</b>	<b>CO2:</b> Understand the pollution problems and apply the environmental science knowledge on solid waste management, disaster management	II (UNDERSTAND)
<b>CO3</b>	<b>CO3:</b> Apply the environmental science knowledge to improve the resources Evaluate and understand the sustainable environmental conditions and control methods	III (APPLY)
<b>CO4</b>	<b>CO4:</b> 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	IV (ANALYZE)
<b>CO5</b>	<b>CO5:</b> Understand the gender problems and ways of addressing them, including interactions across local to global scales in communities and overcome inequalities with legislations	II (UNDERSTAND)

**Table 1: CO, PO, PSO MAPPING**

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	
1	H	S	H	S	S	H	S	H	H	S	S	H	
2				H		S	H	S	H	H	H		
3	S	H	H	S	H	H	S	H		S		S	
4	H	S	S		S			H	S	H	S	S	
5	S	H	H	S	S	H	S	H	H	H		H	

**H: Highly Supportive**

**S: Supportive**

## Table2: COURSEOUTCOME ATTAINMENT

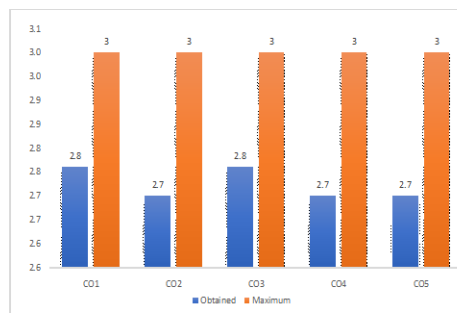
### ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Passpercentbetween75%-85%= 2

Passpercentbetween75%-65%=1

Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		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	39.1	0.0	2.4	97.8	3.0	3.0	2.8
CO2	100.0	3.0			100.0	3.0			100.0	3.0	39.1	0.0	2.3	97.8	3.0	3.0	2.7
CO3	100.0	3.0	97.8	3.0	100.0	3.0			100.0	3.0	39.1	0.0	2.4	97.8	3.0	3.0	2.8
CO4			97.8	3.0	100.0	3.0			100.0	3.0	39.1	0.0	2.3	97.8	3.0	3.0	2.7
CO5			97.8	3.0	100.0	3.0			100.0	3.0	39.1	0.0	2.3	97.8	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 midsemester exam needs to improve to improve overall course outcome attainment level.

**Table3: 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	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO1	H 2.76		H 2.76			H 2.76		H 2.76
CO2				H 2.7			H 2.7	
CO3		H 2.76	H 2.76		H 2.76	H 2.76		H 2.76
CO4	H 2.7							H 2.7
CO5		H 2.7	H 2.7			H 2.7		H 2.7
AVERAGE OF COS FOR POS	2.73	2.73	2.74	2.7	2.76	2.74	2.7	2.73
AVERAGE OF POS	2.715	2.73	2.733333	2.7	2.76	2.733333	2.7	2.7225
AVERAGE	2.724270833							

## COURSE OUTCOME MAPPING

### MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

**COURSE TITLE: PYTHON PROGRAMMING**

**COURSE CODE: CSC21304**

**CREDITS: 4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### Programme Outcomes – (B. Sc.)

##### B. Sc.:

- **PO1. Scientific Knowledge:** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental

considerations.

- **PO3.Problemanalysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4.Moderntoolusage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5.Environmentandsustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individualandteam 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-longlearning:** 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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1: Explain</b> the basics of Python Programming constructs.	V (EVALUATE)
<b>CO2</b>	<b>CO2: Subdivides</b> larger problems into smaller ones using functions	IV (ANALYZE)
<b>CO3</b>	<b>CO3: Apply</b> various data structures for problem solving	III (APPLY)
<b>CO4</b>	<b>CO4: Apply</b> object-oriented programming features for solving a given problem	III (APPLY)
<b>CO5</b>	<b>CO5: Select</b> an appropriate exception handling depending on application and design file operations using Python standard library.	IV (ANALYZE)

**Table1: CO, PO, PSO MAPPING**

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	
1	H	S	H	S	S	H	S	S	H	S	S	H	
2	H		H	H		S	H	S	H	H	H	H	
3	H	H	H	H	H		H	S	S	H		H	
4	H	S	H	H	S		H	S		H		S	
5	H		H	H	S	H	S	H		H	S	H	

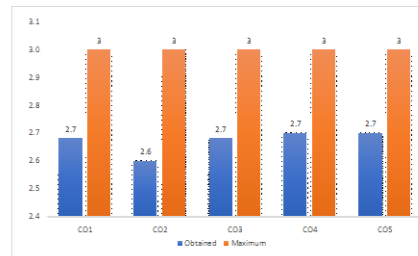
**H: Highly Supportive**

**S: Supportive**

**Table2: COURSE OUTCOME ATTAINMENT**

**ATTAINMENT SCALE:**

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



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		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	82.6	2.0			100.0	3.0	100.0	3.0	100.0	3.0	21.7	0.0	2.2	87.0	3.0	3.0	2.7
CO2	82.6	2.0			100.0	3.0			100.0	3.0	21.7	0.0	2.0	87.0	3.0	3.0	2.6
CO3	82.6	2.0	95.7	3.0	100.0	3.0			100.0	3.0	21.7	0.0	2.2	87.0	3.0	3.0	2.7
CO4			95.7	3.0	100.0	3.0			100.0	3.0	21.7	0.0	2.3	87.0	3.0	3.0	2.7
CO5			95.7	3.0	100.0	3.0			100.0	3.0	21.7	0.0	2.3	87.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.672

**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.

**Table3: PROGRAMMEOUTCOME 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	P01	P02	P03	P04	P05	P06	P07	P08
C01	H 2.76		H 2.76			H 2.76		
C02	H 2.7		H 2.7	H 2.7			H 2.7	
C03	H 2.76	H 2.76	H 2.76	H 2.76	H 2.76		H 2.76	
C04	H 2.7		H 2.7	H 2.7			H 2.7	
C05	H 2.7		H 2.7	H 2.7		H 2.7		H 2.7
AVERAGE OF COS FOR POS	2.724	2.76	2.724	2.715	2.76	2.73	2.72	2.7
AVERAGE OF POS	2.7168	2.76	2.7168	2.715	2.76	2.715	2.72	2.7
AVERAGE	2.72545							

## COURSE OUTCOME MAPPING

### MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

**COURSE TITLE: VIRTUALIZATION AND CLOUD**

**COURSE CODE: CSC21303**

**CREDITS: 4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### Programme Outcomes – (B. Sc.)

##### B. Sc.:

- **PO1. Scientific Knowledge:** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental

considerations.

- **PO3.Problemanalysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4.Moderntoolusage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5.Environmentandsustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individualandteam 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-longlearning:** 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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1: Understand</b> Distributed Systems and its Application.	II (UNDERSTAND)
<b>CO2</b>	<b>CO2: Analyze</b> Cloud Service Models and Deployment Models	IV (ANALYZE)
<b>CO3</b>	<b>CO3: Demonstrate</b> Virtual Networks Configuring and Managing Virtual Storage.	III (APPLY)
<b>CO4</b>	<b>CO4: Understand</b> vSphere Update Manager and Host Maintenance	II (UNDERSTAND)
<b>CO5</b>	<b>CO5: Demonstrate</b> Role of data center in cloud computing	III (APPLY)

**Table1: CO, PO, PSO MAPPING**

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

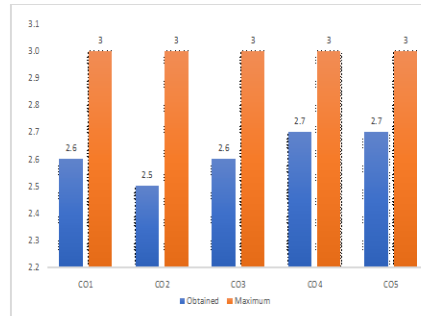
**H:Highly Supportive**

**S: Supportive**

**Table2: COURSE OUTCOME ATTAINMENT**

**ATTAINMENT SCALE:**

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



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		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	73.9	1.0			100.0	3.0	100.0	3.0	100.0	3.0	34.8	0.0	2.0	97.8	3.0	3.0	2.6
CO2	73.9	1.0			100.0	3.0			100.0	3.0	34.8	0.0	1.8	97.8	3.0	3.0	2.5
CO3	73.9	1.0	93.5	3.0	100.0	3.0			100.0	3.0	34.8	0.0	2.0	97.8	3.0	3.0	2.6
CO4			93.5	3.0	100.0	3.0			100.0	3.0	34.8	0.0	2.3	97.8	3.0	3.0	2.7
CO5			93.5	3.0	100.0	3.0			100.0	3.0	34.8	0.0	2.3	97.8	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.62

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

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

**Table3: PROGRAMMEOUTCOME MAPPING**

**Instruction:**

1. Copythe completedtable1.
2. RetainonlythePOsandtheHighlysupportive(H)points. [DeletethePSOcolumnsandthe‘S’points]
3. Writetherespective CO-wisetotalaverage (columnK intable2) wherevereachCO ismapped as(H)under eachPO. ]



OUTCOM E	PO 1	PO2	PO 3	PO 4	PO 5	PO6	PO 7	PO8
CO1	H 2.84		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
CO4	H 2.8		H 2.8					H 2.8
CO5	H 2.8		H 2.8	H 2.8			H 2.8	
AVERAGEOF COSFOR POS	2.81	2.84	2.816	2.813333333	2.84	2.82	2.813333333	2.8
AVERAGEOF POS	2.8025	2.84	2.8112	2.81333 3		2.84	2.81	2.81333 3
AVERA GE	2.81629583 3							

**COURSE OUTCOME MAPPING**

**MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES**

**COURSE TITLE: INFRASTRUCTURE MANAGEMENT**

**COURSE CODE: CSC21302**

**CREDITS: 4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

**Programme Outcomes – (B. Sc.)**

**B. Sc.:**

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

- **PO2.Design/developmentofsolutions:** Designsolutionsforcomplexengineeringproblemsanddesignssystemcomponentsorprocesses that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problemanalysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4.Moderntoolusage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5.Environmentandsustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individualandteam 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-longlearning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1: Demonstrate</b> Installation and Managing Windows 10 Systems	III (APPLY)
<b>CO2</b>	<b>CO2: Analyze</b> Managing Systems using System Center 2012	IV (ANALYZE)
<b>CO3</b>	<b>CO3: Demonstrate</b> Deployment and Management of System Center 2012	III (APPLY)
<b>CO4</b>	<b>CO4: Understand</b> Managing and Monitoring Infrastructure using System Center 2012	II (UNDERSTAND)
<b>CO5</b>	<b>CO5: Demonstrate</b> Reporting of Infrastructure using System Center 2012	III (APPLY)

**Table1: CO, PO, PSO MAPPING**

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	
1	H	S	H	S	S	H	S	H	H	S	S	H	
2		H		H		S	H	S	H	H	H	H	
3	S	H	H	S	H		S	S		S		H	
4	H	S	S		S	H	H	H		H	H	S	
5	H		H	H	S	H	S	H	H	H	S	H	

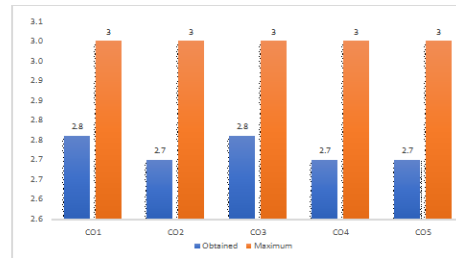
**H: Highly Supportive**

**S: Supportive**

**Table2: COURSE OUTCOME ATTAINMENT**

**ATTAINMENT SCALE:**

- Pass percent of 85% and above= 3
- Passpercentbetween75%-85%= 2
- Passpercentbetween65%-75%=1
- Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	co wise total average
CO1	95.7	3.0			100.0	3.0	100.0	3.0	100.0	3.0	21.7	0.0	2.4	95.7	3.0	3.0	2.8
CO2	<b>95.7</b>	<b>3.0</b>			<b>100.0</b>	<b>3.0</b>			<b>100.0</b>	<b>3.0</b>	<b>21.7</b>	<b>0.0</b>	<b>2.3</b>	<b>95.7</b>	<b>3.0</b>	<b>3.0</b>	<b>2.7</b>
CO3	95.7	3.0	93.5	3.0	100.0	3.0			100.0	3.0	21.7	0.0	2.4	95.7	3.0	3.0	2.8
CO4			<b>93.5</b>	<b>3.0</b>	<b>100.0</b>	<b>3.0</b>			<b>100.0</b>	<b>3.0</b>	<b>21.7</b>	<b>0.0</b>	<b>2.3</b>	<b>95.7</b>	<b>3.0</b>	<b>3.0</b>	<b>2.7</b>
CO5			93.5	3.0	100.0	3.0			100.0	3.0	21.7	0.0	2.3	95.7	3.0	3.0	2.7

AVERAGE	AVERAGE
<b>3</b>	<b>2.724</b>

**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.

**Table3: PROGRAMMEOUTCOME 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			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			
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		H 2.8
AVERAGE OF COS FOR POS	2.813333333	2.82	2.826666667	2.8	2.84	2.813333333	2.8	2.813333333
AVERAGE OF POS	2.804444	2.82	2.822222	2.8	2.84	2.804444	2.8	2.804444
AVERAGE	2.81944444							

## **COURSE OUTCOME MAPPING**

### **MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES**

**COURSE TITLE: DISCRETE MATHEMATICS**

**COURSE CODE: CSC21301**

**CREDITS: 4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

**Programme Outcomes – (B. Sc.)**

**B. Sc.:**

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

- **PO2.Design/developmentofsolutions:** Designsolutionsforcomplexengineeringproblemsanddesignssystemcomponentsorprocesses that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problemanalysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4.Moderntoolusage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5.Environmentandsustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individualandteam 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-longlearning:** Recognise the need and ability to engage in independent and life-long learning in the context of technological change.

#### **PROGRAMMESPECIFICOUTCOMES(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.

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

**Table1: CO, PO, PSO MAPPING**

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	
1	H	S	H	S	S	H	S	H	H	S	H	H	
2				H		S	H	S	H	H			
3	H	H	H	H	H	H	S	S		S	H	H	
4	H	S	S		S			H	S	H	S	S	
5	S	H	H	S	S	H	S	H	H	H	H	H	

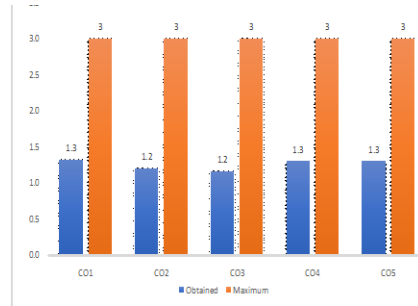
**H: Highly Supportive**

**S: Supportive**

**Table2: COURSE OUTCOME ATTAINMENT**

**ATTAINMENT SCALE:**

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



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		co wise external average	co wise total average		
CO1	41.3	0.0			100.0	3.0	97.8	3.0	100.0	3.0	28.3	0.0	1.8	73.9	1.0	1.0	1.3
CO2	<b>41.3</b>	<b>0.0</b>			<b>100.0</b>	<b>3.0</b>			<b>100.0</b>	<b>3.0</b>	<b>28.3</b>	<b>0.0</b>	<b>1.5</b>	<b>73.9</b>	<b>1.0</b>	<b>1.0</b>	<b>1.2</b>
CO3	41.3	0.0	65.2	1.0	100.0	3.0			100.0	3.0	28.3	0.0	1.4	73.9	1.0	1.0	1.2
CO4			<b>65.2</b>	<b>1.0</b>	<b>100.0</b>	<b>3.0</b>			<b>100.0</b>	<b>3.0</b>	<b>28.3</b>	<b>0.0</b>	<b>1.8</b>	<b>73.9</b>	<b>1.0</b>	<b>1.0</b>	<b>1.3</b>
CO5			65.2	1.0	100.0	3.0			100.0	3.0	28.3	0.0	1.8	73.9	1.0	1.0	1.3

AVERAGE	AVERAGE
<b>1</b>	<b>1.256</b>

**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 midsemester exam needs to improve to improve overall course outcome attainment level.

**Table3: PROGRAMMEOUTCOME MAPPING**

**Instruction:**

- 1. Copythe completedtable1.**
- 2. RetainonlythePOsandtheHighlysupportive(H)points. [DeletethePSOcolumnsandthe‘S’points]**
- 3. Writetherespective CO-wisetotal average(column Kintable2) wherevereach COis mappedas(H)undereach PO.]**



OUTCOME	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO1	H 2.92		H 2.92			H 2.92		H 2.92
CO2				H 2.9			H 2.9	
CO3	H 2.92	H 2.92	H 2.92	H 2.92	H 2.92	H 2.92		
CO4	H 2.9							H 2.9
CO5		H 2.9	H 2.9			H 2.9		H 2.9
AVERAGE OF COS FOR POS	2.913333333	2.91	2.913333333	2.91	2.92	2.913333333	2.9	2.906666667
AVERAGE OF POS	2.911111	2.91	2.911111	2.91	2.92	2.911111	2.9	2.902222
AVERAGE	2.90944444							
	4							

## **COURSE OUTCOME MAPPING**

### **MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES**

**COURSE TITLE: INFORMATION AND STORAGE MANAGEMENT**

**COURSE CODE: CSC22501A**

**CREDITS: 4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### **Programme Outcomes – (B. Sc.)**

##### **B. Sc.:**

- **PO1. Scientific Knowledge:** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3. Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6. Individual and teamwork:** 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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1: Understand</b> core elements of the data center.	II (UNDERSTAND)
<b>CO2</b>	<b>CO2: Explain</b> data protection technique.	II (UNDERSTAND)
<b>CO3</b>	<b>CO3:</b> Assess various storage networking technologies	V (EVALUATE)
<b>CO4</b>	<b>CO4:</b> Prepare backup and archiving of data	III (APPLY)
<b>CO5</b>	<b>CO5:</b> Organize data using replication techniques	VI (CREATE)

**Table1: CO, PO, PSO MAPPING**

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

**H:Highly Supportive**

**S:Supportive**

## Table2: COURSE OUTCOME ATTAINMENT

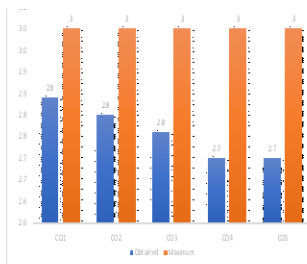
### ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Passpercentbetween75%-85%= 2

Passpercentbetween75%-65%=1

Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		External Exam			co wise total average	
	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	95.8	3.0			100.0	3.0	91.7	3.0	100.0	3.0	70.8	1.0	2.6	95.8	3.0	3.0	2.8
CO2	<b>95.8</b>	<b>3.0</b>			<b>100.0</b>	<b>3.0</b>			<b>100.0</b>	<b>3.0</b>	<b>70.8</b>	<b>1.0</b>	<b>2.5</b>	<b>95.8</b>	<b>3.0</b>	<b>3.0</b>	<b>2.8</b>
CO3	95.8	3.0	83.3	2.0	100.0	3.0			100.0	3.0	70.8	1.0	2.4	95.8	3.0	3.0	2.8
CO4			<b>83.3</b>	<b>2.0</b>	<b>100.0</b>	<b>3.0</b>			<b>100.0</b>	<b>3.0</b>	<b>70.8</b>	<b>1.0</b>	<b>2.3</b>	<b>95.8</b>	<b>3.0</b>	<b>3.0</b>	<b>2.7</b>
CO5			83.3	2.0	100.0	3.0			100.0	3.0	70.8	1.0	2.3	95.8	3.0	3.0	2.7

AVERAGE	AVERAGE
<b>3</b>	<b>2.76</b>

**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.

**Table3: PROGRAMMEOUTCOME 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	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	H 2.7	H 2.7	H 2.7
CO5	H 2.7		H 2.7		H 2.7		H 2.7	H 2.7
AVERAGE OF COS FOR POS	2.74	2.76	2.7	2.73	2.73	2.7	2.7	2.72
AVERAGE OF POS	2.733333	2.76	2.7	2.7225	2.7225	2.7	2.7	2.706667
AVERAGE	2.718125							

## **COURSE OUTCOME MAPPING**

### **MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES**

**COURSE TITLE: CLOUD COMPUTING TOOLS AND TECHNIQUES**

**COURSE CODE: CSC22501B**

**CREDITS: 4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### **Programme Outcomes – (B. Sc.)**

##### **B. Sc.:**

- **PO1. Scientific Knowledge:** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3. Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6. Individual and teamwork:** 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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1:</b> Explain the characteristics and components of cloud computing.	II (UNDERSTAND)
<b>CO2</b>	<b>CO2:</b> : Illustrate architectural influences, benefits and limitations of cloud	IV (ANALYZE)
<b>CO3</b>	<b>CO3:</b> Analyse various layers and models in cloud	IV (ANALYZE)
<b>CO4</b>	<b>CO4:</b> Assess various cloud simulators	V (EVALUATE)
<b>CO5</b>	<b>CO5:</b> Create virtual machines using VMWare Simulator	VI (CREATE)

**Table1: CO, PO, PSO MAPPING**

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	P08	PSO 1	PSO 2	PSO 3	PS O4	
1	H	H		H	H			H		H		H	
2		H				S	H			S			
3	H			H	H			S		H			
4	S			H			S	H	H	S	H	H	
5	H		H		H		H	S	H		S	H	

**Supportive**

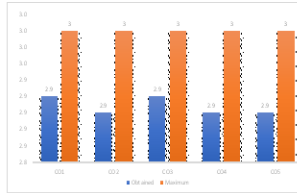
**H:Highly Supportive**

**S:**

**Table2: COURSE OUTCOME ATTAINMENT**

**ATTAINMENT SCALE:**

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



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		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	79.2	2.0	2.8	100.0	3.0	3.0	2.9
CO2	100.0	3.0			100.0	3.0			100.0	3.0	79.2	2.0	2.8	100.0	3.0	3.0	2.9
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	79.2	2.0	2.8	100.0	3.0	3.0	2.9
CO4			100.0	3.0	100.0	3.0			100.0	3.0	79.2	2.0	2.8	100.0	3.0	3.0	2.9
CO5			100.0	3.0	100.0	3.0			100.0	3.0	79.2	2.0	2.8	100.0	3.0	3.0	2.9

AVERAGE	AVERAGE
3	2.900

**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.

**Table3: 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		H 2.84	H 2.84			H 2.84
CO2		H 2.8					H 2.8	
CO3	H 2.84			H 2.84	H 2.84			
CO4				H 2.8				H 2.8
CO5	H 2.8		H 2.8		H 2.8		H 2.8	
AVERAGE OF COS FOR POS	2.82666667	2.82	2.8	2.82666667	2.82666667		2.8	2.82
AVERAGE OF POS	2.822222	2.81	2.8	2.822222	2.822222		2.8	2.81
AVERAGE	2.812380952							

## **COURSE OUTCOME MAPPING**

### **MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES**

**COURSE TITLE: MACHINE LEARNING**

**COURSE CODE: CSC22502**

**CREDITS: 4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### **Programme Outcomes – (B. Sc.)**

##### **B. Sc.:**

- **PO1. Scientific Knowledge:** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3. Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6. Individual and teamwork:** 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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1: Demonstrate</b> python constructs for machine learning.	III (APPLY)
<b>CO2</b>	<b>CO2: Illustrate</b> machine learning types and applications	IV (ANALYZE)
<b>CO3</b>	<b>CO3: Explain</b> concepts of neural network and regression for machine learning	II (UNDERSTAND)
<b>CO4</b>	<b>CO4: Evaluate</b> various classifiers of machine learning	V (EVALUATE)
<b>CO5</b>	<b>CO5: Design</b> unsupervised learning models	VI (CREATE)

**Table1: CO, PO, PSO MAPPING**

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	
1	H	H		H	H			H		H		H	
2		H				S	H			S			
3	H	H		H	H			S	S	H	S		
4	S			H	H		S	H	H	S	H	H	
5	H		H		H		H	S	H		S	H	

**Supportive**

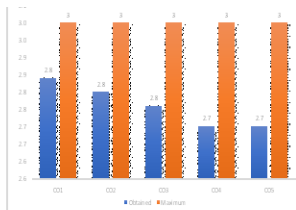
**H: Highly Supportive**

**S:**

## Table2: COURSE OUTCOME ATTAINMENT

### ATTAINMENT SCALE:

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



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		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	93.8	3.0			100.0	3.0	100.0	3.0	100.0	3.0	72.9	1.0	2.6	97.9	3.0	3.0	2.8
CO2	93.8	3.0			100.0	3.0			100.0	3.0	72.9	1.0	2.5	97.9	3.0	3.0	2.8
CO3	93.8	3.0	77.1	2.0	100.0	3.0			100.0	3.0	72.9	1.0	2.4	97.9	3.0	3.0	2.8
CO4			77.1	2.0	100.0	3.0			100.0	3.0	72.9	1.0	2.3	97.9	3.0	3.0	2.7
CO5			77.1	2.0	100.0	3.0			100.0	3.0	72.9	1.0	2.3	97.9	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.76

**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.

## Table3: 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 2.75	H 2.75		H 2.75	H 2.75			H 2.75
CO2		H 2.7					H 2.7	
CO3	H 2.75	H 2.75		H 2.75	H 2.75			
CO4				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	2.74	2.74	2.7	2.74	2.75		2.7	2.73
AVERAGE OF POs	2.733333	2.733333	2.7	2.733333	2.7225		2.7	2.715
AVERAGE	2.72642857							

## COURSE OUTCOME MAPPING

### MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

**COURSE TITLE: SOFTWARE TESTING**

**COURSE CODE: CSC22503**

**CREDITS: 4**

**DEPARTMENT: B. Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

Programme Outcomes – (B. Sc.)

B. Sc.:

- PO1. Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- PO2. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO3. Problem analysis: Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO4. Modern tool usage: Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- PO5. Environment and sustainability: Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- PO6. Individual and teamwork: 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.

	<b>COURSEOUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>C O 1</b>	<b>CO1:Understand</b> SeleniumArchitectureand its components	II (UNDERSTAND)
<b>C O 2</b>	<b>CO2: Use</b> SeleniumWebDriver	III (APPLY)
<b>C O 3</b>	<b>CO3:Apply</b> WebDriveradvanced features	III (APPLY)
<b>C O 4</b>	<b>CO4:Write</b> Testcases using Testing	II (UNDERSTAND)
<b>C O 5</b>	<b>CO5:Develop</b> Recordand importing testswithSeleniumIDE	VI (CREATE)

**Table1: CO, PO, PSO MAPPING**

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	P08	PSO 1	PSO 2	PSO 3	PS O4	
1	H	H		H	H			H		H		H	
2		S				S	H	S	S	S			
3	H	S		S	H		S	S	H	H	S	H	
4	S			H	H		H	H	H	H	H	H	
5	H		H		H		H	S	H		H	H	

**Supportive**

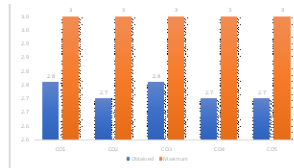
**H:Highly Supportive**

**S:**

**Table2: COURSE OUTCOME ATTAINMENT**

**ATTAINMENT SCALE:**

- Pass percent of 85% and above= 3
- Passpercentbetween75%-85%= 2
- Passpercentbetween75%-65%=1
- Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		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	93.8	3.0			100.0	3.0	100.0	3.0	100.0	3.0	47.9	0.0	2.4	97.9	3.0	3.0	2.8
CO2	93.8	3.0			100.0	3.0			100.0	3.0	47.9	0.0	2.4	97.9	3.0	3.0	2.8
CO3	93.8	3.0	85.4	3.0	100.0	3.0			100.0	3.0	47.9	0.0	2.4	97.9	3.0	3.0	2.8
CO4			85.4	3.0	100.0	3.0			100.0	3.0	47.9	0.0	2.3	97.9	3.0	3.0	2.7
CO5			85.4	3.0	100.0	3.0			100.0	3.0	47.9	0.0	2.3	97.9	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.728

**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 midsemester exam needs to improve to improve overall course outcome attainment level.

**Table3: PROGRAMMEOUTCOME 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	H 2.76			H 2.76
CO2							H 2.7	
CO3	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	2.74	2.76	2.7	2.75	2.75		2.7	2.73
AVERAGE OF POs	2.733333	2.76	2.7	2.715	2.7225		2.7	2.715
AVERAGE	2.720633333							

## **COURSE OUTCOME MAPPING**

### **MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES**

**COURSE TITLE: CLIENT RELATIONSHIP MANAGEMENT**

**COURSE CODE: CSC22504**

**CREDITS: 4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### **Programme Outcomes – (B. Sc.)**

##### **B. Sc.:**

- **PO1. Scientific Knowledge:** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3. Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6. Individual and teamwork:** 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:**Recognisetheneedandabilitytoengageindependentand lifelong learning in the context of technological change.

**PROGRAMMESPECIFICOUTCOMES(DEPARTMENTAL):**

**Studentswill be ableto:**

**PSO1.** Demonstrate in-depth knowledge in the foundational areas of the mathematical sciencesandCommunicatemathematicalideasusingnumerical,graphicalandsymbolic representations.

**PSO2.**Recognizetheimportanceandvalueofmathematicalandstatisticalthinking,training, and approach to problem solving, on a diverse variety of disciplines.

**PSO3.**Useemergingtechnologiesandcomputingconcepts.

**PSO4.**Applymathematical,computationalandstatisticaltoolstodetectpatternsandmodel performance.

	<b>COURSEOUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1:Definetaskmanagementusingassignmentrules, presence, and work notes</b>	III (APPLY)
<b>CO2</b>	<b>CO2:Usevarious scripttypes throughoutthe platform</b>	IV(ANALYZE)
<b>CO3</b>	<b>CO3:ExplainFlowsandWorkflowsforprocessautomation</b>	III (APPLY)
<b>CO4</b>	<b>co4:ChooseAccessControlrulestoprotectServiceNowinstancedata</b>	VI(CREATE)
<b>CO5</b>	<b>CO5:FormulateCapturingandmovingconfigurationsbetween instances, using update sets</b>	IV(ANALYZE)

**Table1: CO, PO, PSO MAPPING**

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	P08	PSO 1	PSO 2	PSO 3	PSO 4	
1	H	H		H	H			H	S	H		H	
2		S				H	H	S	S	S			
3	H	H	H	H	H	H	S	H	H	S	S	H	
4	H		H	H	S		S	S	H	H	S	S	
5	H		H		H		H	S	H	H	H	H	

**Supportive**

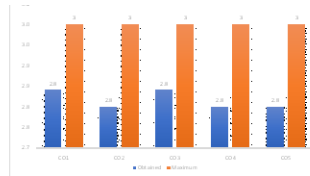
**H:Highly Supportive**

**S:**

**Table2: COURSE OUTCOME ATTAINMENT**

**ATTAINMENT SCALE:**

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



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		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	70.8	1.0	2.6	97.9	3.0	3.0	2.8
CO2	100.0	3.0			100.0	3.0			100.0	3.0	70.8	1.0	2.5	97.9	3.0	3.0	2.8
CO3	100.0	3.0	97.9	3.0	100.0	3.0			100.0	3.0	70.8	1.0	2.6	97.9	3.0	3.0	2.8
CO4			97.9	3.0	100.0	3.0			100.0	3.0	70.8	1.0	2.5	97.9	3.0	3.0	2.8
CO5			97.9	3.0	100.0	3.0			100.0	3.0	70.8	1.0	2.5	97.9	3.0	3.0	2.8

AVERAGE	AVERAGE
3	2.810

**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.

**Table3: PROGRAMMEOUTCOME MAPPING**

**Instruction:**

- 1. Copythe completedtable1.**
- 2. RetainonlythePOsandtheHighlysupportive(H)points.[DeletethePSOcolumnsand the ‘S’ points]**
- 3. WritetherespectiveCO-wisetotalaverage(columnKintable2)wherevereachCOis mapped as (H) under each PO. ]**



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.84	H 2.84		H 2.84	H 2.84			H 2.84
CO2						H 2.8	H 2.8	
CO3	H 2.84	H 2.84	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				
CO5	H 2.8		H 2.8		H 2.8		H 2.8	
AVERAGE OF COS FOR POS	2.82	2.84	2.813333333	2.826666667	2.826666667	2.82	2.8	2.84
AVERAGE OF POS	2.815	2.84	2.813333	2.822222	2.822222	2.82	2.8	2.84
AVERAGE	2.821597222							

## **COURSE OUTCOME MAPPING**

### **MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES**

**COURSE TITLE: INTRODUCTION TO DIGITAL TECHNOLOGY**

**COURSE CODE: CSC22505**

**CREDITS: 4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE AND COGNITIVE SYSTEMS**

#### **Programme Outcomes – (B. Sc.)**

##### **B. Sc.:**

- **PO1. Scientific Knowledge:** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3. Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6. Individual and teamwork:** 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:**Recognisetheneedandabilitytoengageindependentand lifelong learning in the context of technological change.

**PROGRAMMESPECIFICOUTCOMES(DEPARTMENTAL):**

**Studentswill be ableto:**

**PSO1.** Demonstrate in-depth knowledge in the foundational areas of the mathematical sciencesandCommunicatemathematicalideasusingnumerical,graphicalandsymbolic representations.

**PSO2.**Recognizetheimportanceandvalueofmathematicalandstatisticalthinking,training, and approach to problem solving, on a diverse variety of disciplines.

**PSO3.**Useemergingtechnologiesandcomputingconcepts.

**PSO4.**Applymathematical,computationalandstatisticaltoolstodetectpatternsandmodel performance.

	<b>COURSEOUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1:Understand</b> thefundamentalconceptsofdigital technology	II (UNDERSTAND)
<b>CO2</b>	<b>CO2:Recognize</b> theseuse ofdigital technologyin various industries	VI(CREATE)
<b>CO3</b>	<b>CO3:Understand</b> theprinciplesofAutomatix	II (UNDERSTAND)
<b>CO4</b>	<b>CO4:Understand</b> theprinciplesofAutomation everywhere	II (UNDERSTAND)
<b>CO5</b>	<b>CO5:Create</b> botsandunderstandtheirvarioustypes	VI(CREATE)

**Table1: CO, PO, PSO MAPPING**

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	P08	PSO 1	PSO 2	PSO 3	PSO4	
1	H	H		H	H			H	S	H		H	
2	H		H			H	H	S					
3	H		H	H	H	H	S	H	H		H	H	
4				H	S	H	S		H	H			
5	H	H	H	H	H		H	S	H	H		H	

**Supportive**

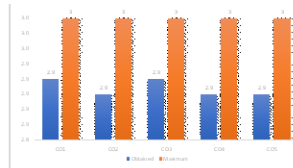
**H:Highly Supportive**

**S:**

**Table2: COURSE OUTCOME ATTAINMENT**

**ATTAINMENT SCALE:**

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



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average		External Exam		co wise total average
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise external average	co wise total average	
CO1	97.9	3.0			100.0	3.0	100.0	3.0	100.0	3.0	79.2	2.0	2.8	100.0	3.0	3.0	2.9
CO2	97.9	3.0			100.0	3.0			100.0	3.0	79.2	2.0	2.8	100.0	3.0	3.0	2.9
CO3	97.9	3.0	97.9	3.0	100.0	3.0			100.0	3.0	79.2	2.0	2.8	100.0	3.0	3.0	2.9
CO4			97.9	3.0	100.0	3.0			100.0	3.0	79.2	2.0	2.8	100.0	3.0	3.0	2.9
CO5			97.9	3.0	100.0	3.0			100.0	3.0	79.2	2.0	2.8	100.0	3.0	3.0	2.9

AVERAGE	AVERAGE
3	2.988

**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.

**Table3: PROGRAMMEOUTCOME 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 2.75	H 2.75		H 2.75	H 2.75			H 2.75
CO2	H 2.7		H 2.7			H 2.7	H 2.7	
CO3	H 2.75		H 2.75	H 2.75	H 2.75	H 2.75		H 2.75
CO4				H 2.7		H 2.7		
CO5	H 2.7	H 2.7	H 2.7	H 2.7	H 2.7		H 2.7	
AVERAGE OF COs FOR POs	2.73	2.73	2.72	2.73	2.74	2.72	2.7	2.76
AVERAGE OF POs	2.7225	2.735	2.72	2.7225	2.733333	2.72	2.7	2.76
AVERAGE	2.734999997							

## **COURSE OUTCOMEMAPPING**

### **MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES**

**COURSE TITLE : GENERAL ENGLISH II**

**COURSE CODE : EN18201**

**CREDITS:3**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### **Programme Outcomes – (B.Sc.)**

B.Sc.:

- **PO1.** Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2.** Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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 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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1:</b> To develop a sound understanding of the formation of words and to demonstrate the functional grammatical components in sentence construction.	I(REMEMBER)
<b>CO2</b>	<b>CO2:</b> To paraphrase ideas and thoughts in a coherent, organized manner in order to utilize writing skills for effective communication and the creation of impactful writing.	IV(CREATE)
<b>CO3</b>	<b>CO3:</b> To create an understanding of Indian literature, while simultaneously developing and refining communication skills.	IV(CREATE)
<b>CO4</b>	<b>CO4:</b> To recognize the moral elements present in short stories, along with exposure to informal language use.	I(REMEMBER)
<b>CO5</b>	<b>CO5:</b> To enhance listening and speaking skills through effective sentence construction and efficient delivery.	V(EVALUATE)

**Table1: CO,PO,PSOMAPPING**



DEPARTMENT:

SUBJECT:

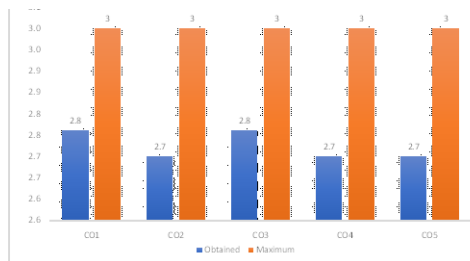
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01		H	H	S	H	S	S	S		S	H	H
C02	S	S	S		H	H		S	H	H	H	H
C03	H	S		H	H	H	S	H	H		S	H
C04	H	H	S		S	S	S	S		H	H	S
C05	H	H		S	S	S	S	H	H	H	H	H

H: Highly Supportive  
S: Supportive

**Table2:COURSEOUTCOMEATTAINMENT**

**ATTAINMENTSCALE:**

- Pass percent of 85% and above= 3
- Passpercentbetween75%-85%=2
- Passpercentbetween75%-65%=1 Pass
- percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	co wise total average
CO1	95.8	3.0			100.0	3.0	100.0	3.0	100.0	3.0	47.9	0.0	2.4	100.0	3.0	3.0	2.8
CO2	95.8	3.0			100.0	3.0			100.0	3.0	47.9	0.0	2.3	100.0	3.0	3.0	2.7
CO3	95.8	3.0	87.5	3.0	100.0	3.0			100.0	3.0	47.9	0.0	2.4	100.0	3.0	3.0	2.8
CO4			87.5	3.0	100.0	3.0			100.0	3.0	47.9	0.0	2.3	100.0	3.0	3.0	2.7
CO5			87.5	3.0	100.0	3.0			100.0	3.0	47.9	0.0	2.3	100.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

**RESULT ANALYSIS: (Only write 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 midsemester exam needs to improve to improve overall course outcome attainment level.

**Table3:PROGRAMMEOUTCOMEMAPPING**

**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		H 2.76			
CO2					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		H 2.76
CO4	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	2.73	2.72	2.74	2.76	2.74	2.72	2.7	2.73
AVERAGE OF POS	2.7225	2.706667	2.733333	2.76	2.733333	2.72	2.7	2.73
AVERAGE	2.725729167							

**COURSE OUTCOMEMAPPING**

**MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES**

**COURSE TITLE : INDIAN HERITAGE AND CULTURE**

**COURSE CODE : IC19201**

**CREDITS:2**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

Programme Outcomes – (B.Sc.)

B.Sc.:

- PO1. Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- PO2. Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO3. Problem Analysis: Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO4. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, modern technology, and IT tools to complex science and technological activities.
- PO5. Environment and Sustainability: Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- PO6. Individual and Teamwork: 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 be 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.

**PROGRAMMESPECIFICOUTCOMES (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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	The student can understand better about the origin of ancient Indian culture and the contributions of great rulers from both north and south India for Indian culture in ancient days.	II(UNDERSTAND)
<b>CO2</b>	Students will analyze how Persian culture entered into India and how it influenced the Fine Arts of Indian society, like Classical Music, Dance, and Architecture.	IV(ANALYZE)
<b>CO3</b>	Students can be able to assess how the Indian orthodox society turned into a modern and western society in the 19th century..It also edifies the students with spiritual doctrines of various Religions.	III(APPLY)
<b>CO4</b>	Students will evaluate various challenges faced by the youth and the evil effects of terrorism on society.	V(EVALUATE)
<b>CO5</b>	The topics in the unit create belongingness among the students by bringing awareness of the rights and duties to make the world a better place, and it throws light on gender sensitization issues of women, children, and LGBT.	VI(CREATE)

**Table1: CO,PO,PSOMAPPING**



DEPARTMENT:

SUBJECT:

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

H: Highly Supportive  
S: Supportive

**Table2: COURSE OUTCOME ATTAINMENT**

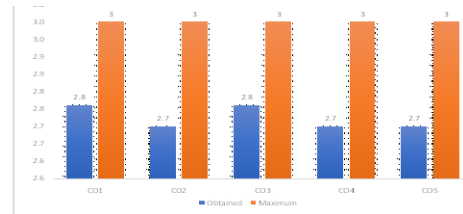
**ATTAINMENT SCALE:**

Pass percent of 85% and above= 3

Pass percent between 75%-85%=2

Pass percent between 65%-75%=1

Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			co wise total average
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	
CO1	93.8	3.0			100.0	3.0	100.0	3.0	100.0	3.0	45.8	0.0	2.4	100.0	3.0	3.0	2.8
CO2	93.8	3.0			100.0	3.0			100.0	3.0	45.8	0.0	2.3	100.0	3.0	3.0	2.7
CO3	93.8	3.0	95.8	3.0	100.0	3.0			100.0	3.0	45.8	0.0	2.4	100.0	3.0	3.0	2.8
CO4			95.8	3.0	100.0	3.0			100.0	3.0	45.8	0.0	2.3	100.0	3.0	3.0	2.7
CO5			95.8	3.0	100.0	3.0			100.0	3.0	45.8	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.

**Table3:PROGRAMMEOUTCOMEMAPPING**

**Instruction:**

4. Copy the completed table 1.
5. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]
6. 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
C01	H 2.76	H 2.76	H 2.76					
C02						H 2.7	H 2.7	
C03	H 2.76		H 2.76	H 2.76	H 2.76			
C04						H 2.7		
C05	H 2.7	H 2.7	H 2.7					H 2.7
AVERAGE OF COS FOR POS	2.74	2.73	2.74	2.76	2.76	2.7	2.7	2.7
AVERAGE OF POS	2.733333	2.715	2.733333	2.76	2.76	2.7	2.7	2.7
AVERAGE	2.725208333							

## COURSE OUTCOMEMAPPING

### MAPPINGCOURSEOUTCOMESLEADINGTOTHEATTAINMENTOFPROGRAMOUTCOMES

**COURSE TITLE : SERVER ADMINISTRATION**

**COURSE CODE : CSC23201**

**CREDITS:4**

**DEPARTMENT:B.Sc.COMPUTERSCIENCE&COGNITIVESYSTEMS**

#### ProgrammeOutcomes–(B.Sc.)

##### B.Sc.:

- PO1. Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- PO2. Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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.

**PROGRAMMESPECIFICOUTCOMES (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.

	COURSEOUTCOMES	BLOOM'STAXONOMYLEVEL
CO1	Choose Different Editions Of Systems	I(REMEMBERING)
CO2	Organize Topologies In Activ Edirectory.	VI(CREATE)
CO3	Compare Different Services In A Ctivedirectory	V(EVALUATING)
CO4	Compare Network In Services.	V(EVALUATING)
CO5	Plan Installation Of Required Services In Organization	VI(CREATE)

Table1: CO,PO,PSOMAPPING



DEPARTMENT: Bsc computer science and cognitive systems

SUBJECT: Server Administration

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
CO1	H	H	H	S	H	S	S	S	H	S	H	H
CO2	S	S	S		H	H	H	S	H	H	H	H
CO3	H	S	H	H	H	H	S	H	H	H	S	H
CO4	H	H	S	S	S	H	S	S	S	H	H	S
CO5	H	H	H	S	S	S	S	H	H	H	H	H

H: Highly Supportive  
S: Supportive

**H:HighlySupportive**

**S:Supportive**

**Table2: COURSE OUTCOME ATTAINMENT**

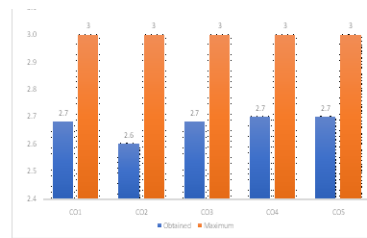
**ATTAINMENT SCALE:**

Pass percent of 85% and above= 3

Pass percent between 75%-85%=2

Pass percent between 65%-75%=1 Pass

percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		External Exam				
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	81.3	2.0			100.0	3.0	100.0	3.0	100.0	3.0	35.4	0.0	2.2	100.0	3.0	3.0	2.7
CO2	81.3	2.0			100.0	3.0			100.0	3.0	35.4	0.0	2.0	100.0	3.0	3.0	2.6
CO3	81.3	2.0	85.4	3.0	100.0	3.0			100.0	3.0	35.4	0.0	2.2	100.0	3.0	3.0	2.7
CO4			85.4	3.0	100.0	3.0			100.0	3.0	35.4	0.0	2.3	100.0	3.0	3.0	2.7
CO5			85.4	3.0	100.0	3.0			100.0	3.0	35.4	0.0	2.3	100.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.672

**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

**Table3:PROGRAMMEOUTCOMEMAPPING**

**Instruction:**

1. Copy the completed table 1.
2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]
3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.68	H 2.68	H 2.68		H 2.68			
CO2					H 2.6	H 2.6	H 2.6	
CO3	H 2.68		H 2.68	H 2.68	H 2.68	H 2.68		H 2.68
CO4	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	2.69	2.693333333	2.686666667	2.68	2.653333333	2.66	2.6	2.69
AVERAGE OF POS	2.6925	2.697778	2.688889	2.68	2.644444	2.66	2.6	2.69
AVERAGE	2.669201389							

**COURSE OUTCOME MAPPING**

**MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES**

**COURSE TITLE : MATHEMATICS FOR COGNITIVE SCIENCE**

**COURSE CODE : CSC20202**

**CREDITS:4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

**Programme Outcomes – (B.Sc.)**

**B.Sc.:**

- PO1. Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- PO2. Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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.

**PROGRAMMESPECIFICOUTCOMES (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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	Construct simple mathematical proofs and possess the ability to verify them..	IV(CREATE)
<b>CO2</b>	Apply basic counting techniques to solve combinatorial problems.	III(APPLY)
<b>CO3</b>	Solve problems using recurrence relations and recursion to analyze algorithms and programs such as finding Fibonacci numbers and Tower of Hanoi problems	V(EVALUATE)
<b>CO4</b>	Understand to find the rank of a matrix and to solve systems of linear equations applying matrix techniques.	II(UNDERSTAND)
<b>CO5</b>	Determine eigenvalues and eigenvectors.	V(EVALUATE)

**Table1: CO,PO,PSOMAPPING**

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

H: Highly Supportive  
S: Supportive

**Table2: COURSE OUTCOME ATTAINMENT**

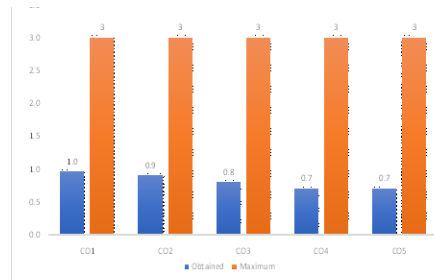
**ATTAINMENT SCALE:**

Pass percent of 85% and above= 3

Pass percent between 75%-85%=2

Pass percent between 65%-75%=1

Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		External Exam			co wise total average	
	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	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	39.6	0.0	2.4	62.5	0.0	0.0	1.0
CO2	100.0	3.0			100.0	3.0			100.0	3.0	39.6	0.0	2.3	62.5	0.0	0.0	0.9
CO3	100.0	3.0	68.8	1.0	100.0	3.0			100.0	3.0	39.6	0.0	2.0	62.5	0.0	0.0	0.8
CO4			68.8	1.0	100.0	3.0			100.0	3.0	39.6	0.0	1.8	62.5	0.0	0.0	0.7
CO5			68.8	1.0	100.0	3.0			100.0	3.0	39.6	0.0	1.8	62.5	0.0	0.0	0.7

AVERAGE	AVERAGE
0	0.812

**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 midsemester exam needs to improve to improve overall course outcome attainment level.

**Table3:PROGRAMMEOUTCOMEMAPPING**

**Instruction:**

**7. Copythecompletedtable1.**

**8. RetainonlythePOsandtheHighlysupportive(H)points.[DeletethePSOcolumnsandthe ‘S’points]**

**9. WritetherespectiveCO-wisetotalaverage(column Kintable2)wherevereach COismapped as(H)undereachPO.]**



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 0.96	H 0.96	H 0.96		H 0.96			
CO2					H 0.9	H 0.9	H 0.9	
CO3	H 0.8		H 0.8	H 0.8	H 0.8	H 0.8		H 0.8
CO4	H 0.7	H 0.7				H 0.7		
CO5	H 0.7	H 0.7	H 0.7					H 0.7
AVERAGE OF COS FOR POS	0.79	0.786666667	0.82	0.8	0.886666667	0.8	0.9	0.75
AVERAGE OF POS	0.7475	0.728889	0.773333	0.8	0.862222	0.8	0.9	0.75
AVERAGE	0.795243056							

**COURSE OUTCOMEMAPPING**

**MAPPINGCOURSEOUTCOMESLEADINGTOTHEATTAINMENTOFPROGRAMOUTCOMES**

**COURSE TITLE : COMPUTER NETWORKS**

**COURSE CODE : CSC20203**

**CREDITS:4**

**DEPARTMENT:B.Sc.COMPUTERSCIENCE&COGNITIVESYSTEMS**

**ProgrammeOutcomes–(B.Sc.)**

**B.Sc.:**

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

- PO2. Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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.

**PROGRAMMESPECIFICOUTCOMES (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.

	<b>COURSEOUTCOMES</b>	<b>BLOOM'STAXONOMYLEVEL</b>
<b>CO1</b>	Identify basic computer network topologies and protocols and explain Data Communication System components	IV(ANALYZE)
<b>CO2</b>	Describe Wireless Transmission	V(EVALUATE)
<b>CO3</b>	Understand IP Addressing Version and Switch Basic	II (UNDERSTAND)
<b>CO4</b>	Configure RIP, EIGRP and OSPF protocols	IV(ANALYZE)
<b>CO5</b>	Understand operation of Wireless networks, NAT and ACL	II (UNDERSTAND)

**Table1: CO,PO,PSOMAPPING**



DEPARTMENT:

SUBJECT:

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

H: Highly Supportive  
S: Supportive

**H:HighlySupportive**

**S:Supportive**

**Table2:COURSEOUTCOMEATTAINMENT**

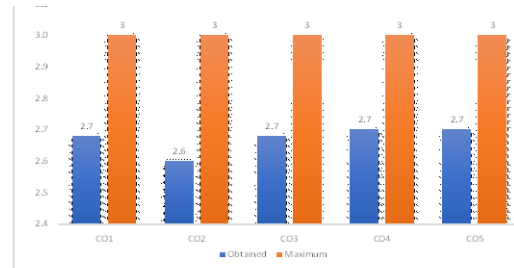
**ATTAINMENTSACLE:**

Pass percent of 85% and above= 3

Passpercentbetween75%-85%=2

Passpercentbetween75%-65%=1 Pass

percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	co wise total average
CO1	81.3	2.0			100.0	3.0	100.0	3.0	100.0	3.0	35.4	0.0	2.2	100.0	3.0	3.0	2.7
CO2	81.3	2.0			100.0	3.0			100.0	3.0	35.4	0.0	2.0	100.0	3.0	3.0	2.6
CO3	81.3	2.0	85.4	3.0	100.0	3.0			100.0	3.0	35.4	0.0	2.2	100.0	3.0	3.0	2.7
CO4			85.4	3.0	100.0	3.0			100.0	3.0	35.4	0.0	2.3	100.0	3.0	3.0	2.7
CO5			85.4	3.0	100.0	3.0			100.0	3.0	35.4	0.0	2.3	100.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.672

**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 midsemester exam needs to improve to improve overall course outcome attainment level.

**Table3:PROGRAMMEOUTCOMEMAPPING**

**Instruction:**

- 1. Copythecompletedtable1.**
- 2. RetainonlythePOsandtheHighlysupportive(H)points.[DeletethePSOcolumnsandthe ‘S’points]**
- 3. WritetherespectiveCO-wisototalaverage(columnK intable2)wherevereachCO ismapped as(H)undereachPO.]**



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.68	H 2.68	H 2.68		H 2.68			
CO2					H 2.6	H 2.6	H 2.6	
CO3	H 2.68		H 2.68	H 2.68	H 2.68	H 2.68		H 2.68
CO4	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	2.69	2.693333333	2.686666667	2.68	2.653333333	2.66	2.6	2.69
AVERAGE OF POS	2.6925	2.697778	2.688889	2.68	2.644444	2.66	2.6	2.69
AVERAGE	2.669201389							

**COURSE OUTCOMEMAPPING**

**MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES**

**COURSE TITLE : DATA STRUCTURES THROUGH C COURSE**

**CODE:BS18202**

**CREDITS:4**

**DEPARTMENT:B.Sc.COMPUTER SCIENCE & COGNITIVE SYSTEMS**

**Programme Outcomes –(B.Sc.)**

**B.Sc.:**

- PO1. Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- PO2. Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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.

**PROGRAMMESPECIFICOUTCOMES (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.

	<b>COURSEOUTCOMES</b>	<b>BLOOM'STAXONOMYLEVEL</b>
<b>Co1</b>	Choose Appropriate Data Structure To Store Present Data Items In Real World Problems	I(Remembering)
<b>Co2</b>	Illustrate Nonlinear Data Structures Like Linked List.	Iv(Analyze)
<b>Co3</b>	Organize The Data Using Sorting And Various Linear Data Structures And Determine The Time Complexity	Vi(Create)
<b>Co4</b>	Construct Data With Nonlinear Data Structure Using Trees	Iii(Applying)
<b>Co5</b>	Explain The Concept Of Graphs And B-Trees	V (Evaluating)

**Table1: CO,PO,PSOMAPPING**



DEPARTMENT:

SUBJECT:

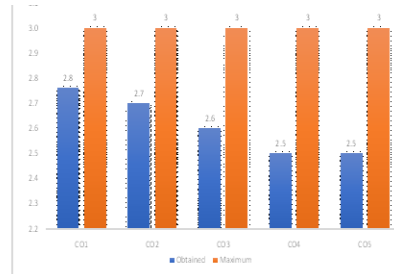
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
c01	H	H	H	S	H	S	S	S	H	S	H	H
c02	S	S	S		H	H	H	S	H	H	H	H
c03	H	S	H	H	H	H	S	H	H	H	S	H
c04	H	H	S		S	H	S	S	S	H	H	S
c05	H	H	H	S	S	S	S	H	H	H	H	H

H: Highly Supportive  
S: Supportive

**Table2:COURSEOUTCOMEATTAINMENT**

**ATTAINMENTSCALE:**

Pass percent of 85% and above= 3  
 Passpercentbetween75%-85%=2  
 asspercentbetween75%-65%=1 Pass  
 percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		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	39.6	0.0	2.4	97.9	3.0	3.0	2.8
CO2	100.0	3.0			100.0	3.0			100.0	3.0	39.6	0.0	2.3	97.9	3.0	3.0	2.7
CO3	100.0	3.0	68.8	1.0	100.0	3.0			100.0	3.0	39.6	0.0	2.0	97.9	3.0	3.0	2.6
CO4			68.8	1.0	100.0	3.0			100.0	3.0	39.6	0.0	1.8	97.9	3.0	3.0	2.5
CO5			68.8	1.0	100.0	3.0			100.0	3.0	39.6	0.0	1.8	97.9	3.0	3.0	2.5

AVERAGE	AVERAGE
3	2.612

**RESULTANALYSIS: (OnlywriteacommentonthetotalCOattainmentforthecourseandareasofimprovement, howlessit isfrom3, 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.

**Table3:PROGRAMMEOUTCOMEMAPPING**

**Instruction:**

**1. Copythecompletedtable1.**

**2. Retain onlythePOsandtheHighlysupportive(H)points.[DeletethePSOcolumnsandthe‘S’points]**

**3. WritetherespectiveCO-wisetotalaverage(column Kintable2)wherevereach COismapped as(H)undereachPO.]**



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.76	H 2.76	H 2.76		H 2.76			
CO2					H 2.7	H 2.7	H 2.7	
CO3	H 2.6		H 2.6	H 2.6	H 2.6	H 2.6		H 2.6
CO4	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	2.59	2.586666667	2.62	2.6	2.686666667	2.6	2.7	2.55
AVERAGE OF POS	2.5475	2.528889	2.573333	2.6	2.662222	2.6	2.7	2.55
AVERAGE	2.595243056							

**COURSE OUTCOMEMAPPING**

**MAPPINGCOURSEOUTCOMESLEADINGTOTHEATTAINMENTOFPROGRAMOUTCOMES**

**COURSE TITLE : PROBABILITY & STATISTICS**

**COURSE CODE : CSC21401**

**CREDITS:4**

**DEPARTMENT:B.Sc.COMPUTERSCIENCE&COGNITIVESYSTEMS**

### **Programme Outcomes – (B.Sc.)**

B.Sc.:

- **PO1.** Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2.** Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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):**

**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.

.

	<b>COURSEOUTCOMES</b>	<b>BLOOM'STAXONOMYLEVEL</b>
<b>CO1</b>	<b>CO1:</b> Employee The Principles Of Linear Regressions And Co-Relations Including Least Square Method, predicting A Particular Value Of (Y) For A given Value Of (X) and Significance Of the Co-Relation Co-Efficient.	III(APPLYING)
<b>CO2</b>	<b>CO2:</b> Use Discrete and Continuous Probability Distributions, Including Requirements, Mean And Variance And Making Decisions.	III(APPLYING)
<b>CO3</b>	<b>CO3:</b> Able To Perform And Analyze Hypotheses Tests Of Means, Proportions And Using Both One-and Two-Sample Datasets..	IV(ANALYZE)
<b>CO4</b>	<b>CO4:</b> Able To Apply The Appropriate Chi-Squared Test For Independence And Goodness Of Fit. Can Differentiate Between The Test Statistics To Be Used For Dependent And Independent Samples.	IV(ANALYZE)
<b>CO5</b>	<b>CO5:</b> Understand The Concepts Of Quality Control, Chance And Assignable Causes Of Variation, Control Charts For Variables.	II(UNDERSTANDING)

**Table1: CO,PO,PSOMAPPING**



DEPARTMENT:

SUBJECT:

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
c01	H	H	H	S	S		S	S	H	S	H	H
c02	H		H	H		H	H	S		H		H
c03	H	S	H	H	H		H	H	H	H	S	H
c04	H		H	H	S	H	H	S	S	H		S
c05	H	H	H	H	S	S	S	H		H	H	H

H: Highly Supportive  
S: Supportive

**H:HighlySupportive**

**S:Supportive**

**Table2:COURSEOUTCOMEATTAINMENT**

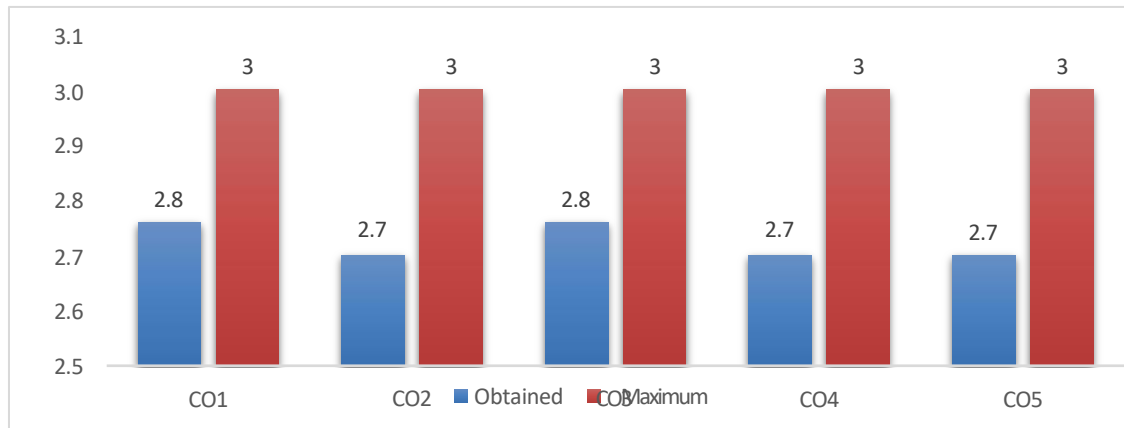
**ATTAINMENTSCALE:**

Pass percent of 85% and above= 3

Passpercentbetween75%-85%=2

Passpercentbetween65%-75%=1

Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			
	pass%	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level	pass %	Attainment level		pass %	Attainment level	co wise external average	co wise total average
CO1	97.8	3.0			100.0	3.0	95.7	3.0	91.3	3.0	43.5	0.0	2.4	89.1	3.0	3.0	2.8
CO2	97.8	3.0			100.0	3.0			91.3	3.0	43.5	0.0	2.3	89.1	3.0	3.0	2.7
CO3	97.8	3.0	87.0	3.0	100.0	3.0			91.3	3.0	43.5	0.0	2.4	89.1	3.0	3.0	2.8
CO4			87.0	3.0	100.0	3.0			91.3	3.0	43.5	0.0	2.3	89.1	3.0	3.0	2.7
CO5			87.0	3.0	100.0	3.0			91.3	3.0	43.5	0.0	2.3	89.1	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 midsemester exam needs to improve to improve overall course outcome attainment level.

**Table3:PROGRAMMEOUTCOMEMAPPING**

**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	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	H 2.76
CO4	H 2.7		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				H 2.7
AVERAGE OF COS FOR POS	2.724	2.73	2.724	2.715	2.76	2.7	2.72	2.73

AVERAGE OF POS	2.7168	2.715	2.7168	2.715	2.76	2.7	2.72	2.73
AVERAGE	2.7217							

## **COURSE OUTCOMEMAPPING**

### **MAPPINGCOURSEOUTCOMESLEADINGTOTHEATTAINMENTOFPROGRAMOUTCOMES**

**COURSE TITLE : OBJECT ORIENTED SYSTEM DEVELOPMENT**

**COURSE CODE : CSC21402**

**CREDITS:3**

**DEPARTMENT:B.Sc.COMPUTERSCIENCE&COGNITIVESYSTEMS**

#### **Programme Outcomes – (B.Sc.)**

B.Sc.:

- **PO1.** Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2.** Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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):**

**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.

	<b>COURSEOUTCOMES</b>	<b>BLOOM'STAXONOMYLEVEL</b>
<b>CO1</b>	CO1: Explain basics of OOSD concepts	II (UNDERSTAND)
<b>CO2</b>	CO2: Categorize Object oriented methodologies and UML diagrams.	V (CREATE)
<b>CO3</b>	CO3: Choose classification theory and performing case studies	III (APPLY)
<b>CO4</b>	CO4: Design models based on Object oriented concept	V (CREATE)
<b>CO5</b>	CO5: Identify software quality, system usability, measuring and satisfaction	IV(ANALYZE)

**Table1: CO,PO,PSOMAPPING**



DEPARTMENT:

SUBJECT:

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

H: Highly Supportive  
S: Supportive

**H:HighlySupportive**

**S:Supportive**

**Table2: COURSE OUTCOME ATTAINMENT**

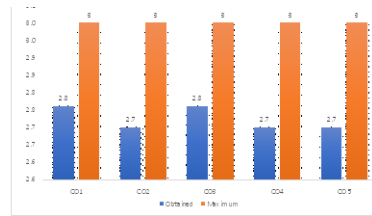
**ATTAINMENT SCALE:**

Pass percent of 85% and above= 3

Pass percent between 75%-85%=2

Pass percent between 65%-75%=1

Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			co wise total average
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	
CO1	91.3	3.0			100.0	3.0	98.5	3.0	100.0	3.0	45.7	0.0	2.4	97.8	3.0	3.0	2.8
CO2	91.3	3.0			100.0	3.0			100.0	3.0	45.7	0.0	2.3	97.8	3.0	3.0	2.7
CO3	91.3	3.0	97.8	3.0	100.0	3.0			100.0	3.0	45.7	0.0	2.4	97.8	3.0	3.0	2.8
CO4			97.8	3.0	100.0	3.0			100.0	3.0	45.7	0.0	2.3	97.8	3.0	3.0	2.7
CO5			97.8	3.0	100.0	3.0			100.0	3.0	45.7	0.0	2.3	97.8	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 midsemester exam needs to improve to improve overall course outcome attainment level.

**Table3:PROGRAMMEOUTCOMEMAPPING**

**Instruction:**

**4. Copythecompletedtable1.**

**5. Retain onlythePOsandtheHighlysupportive(H)points.[DeletethePSOcolumnsandthe‘S’points]**

**6. WritetherespectiveCO-wisetotalaverage(column Kintable2)wherevereach COismapped as(H)undereachPO.]**



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		H 2.7	H 2.7	
CO3	H 2.76		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	H 2.7	
CO5	H 2.7	H 2.7	H 2.7	H 2.7				H 2.7
AVERAGE OF COS FOR POS	2.724	2.73	2.724	2.715	2.76	2.7	2.72	2.73
AVERAGE OF POS	2.7168	2.715	2.7168	2.715	2.76	2.7	2.72	2.73
AVERAGE	2.7217							

COURSE OUTCOMEMAPPING

**MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES**

**COURSE TITLE : ARTIFICIAL INTELLIGENCE**

**COURSE CODE : CSC21403**

**CREDITS:4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

**Programme Outcomes – (B.Sc.)**

B.Sc.:

- **PO1.** Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2.** Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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):**

**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.

	<b>COURSEOUTCOMES</b>	<b>BLOOM'STAXONOMYLEVEL</b>
<b>CO1</b>	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning..	III (APPLY)
<b>CO2</b>	Understand predicate logic and transform real-life information in different representations.	II (UNDERSTAND)
<b>CO3</b>	Understand formal methods of knowledge representation.	II (UNDERSTAND)
<b>CO4</b>	: Demonstrate knowledge representation techniques	III (APPLY)
<b>CO5</b>	Analyze the underlying mathematical relationships and build expert systems.	IV (ANALYZE)

**Table1: CO,PO,PSOMAPPING**



DEPARTMENT:

SUBJECT:

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

H: Highly Supportive  
S: Supportive

**H:HighlySupportive**

**S:Supportive**

**Table2: COURSE OUTCOME ATTAINMENT**

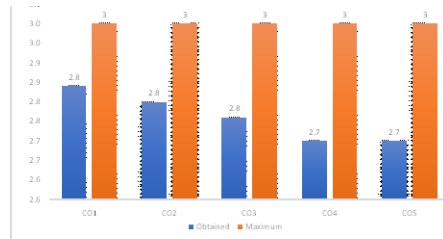
**ATTAINMENT SCALE:**

Pass percent of 85% and above= 3

Pass percent between 75%-85%=2

Pass percent between 65%-75%=1

Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			co wise total average
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	
CO1	89.1	3.0			100.0	3.0	100.0	3.0	100.0	3.0	67.4	1.0	2.6	95.7	3.0	3.0	2.8
CO2	89.1	3.0			100.0	3.0			100.0	3.0	67.4	1.0	2.5	95.7	3.0	3.0	2.8
CO3	89.1	3.0	80.4	2.0	100.0	3.0			100.0	3.0	67.4	1.0	2.4	95.7	3.0	3.0	2.8
CO4			80.4	2.0	100.0	3.0			100.0	3.0	67.4	1.0	2.3	95.7	3.0	3.0	2.7
CO5			80.4	2.0	100.0	3.0			100.0	3.0	67.4	1.0	2.3	95.7	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.76

**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 midsemester exam needs to improve to improve overall course outcome attainment level.

### Table3:PROGRAMMEOUTCOMEMAPPING

**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	H 2.84					
CO2	H 2.8		H 2.8	H 2.8		H 2.8	H 2.8	
CO3	H 2.76		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	H 2.7	
CO5	H 2.7	H 2.7	H 2.7	H 2.7				H 2.7
AVERAGE OF COS FOR POS	2.76	2.77	2.76	2.74	2.76	2.75	2.75333333	2.73
AVERAGE OF POS	2.744	2.735	2.744	2.74	2.76	2.75	2.753333	2.73
AVERAGE	2.744541667							

**MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES****COURSE TITLE : DATABASE MANAGEMENT SY,STEMS****COURSE CODE : CSC21404****CREDITS:4****DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS****Programme Outcomes – (B.Sc.)**

B.Sc.:

- **PO1.** Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2.** Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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):**

**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.

	<b>COURSEOUTCOMES</b>	<b>BLOOM'STAXONOMYLEVEL</b>
<b>CO1</b>	CO1: Represent logical database using Entity Relationship and Enhanced ER model	V (EVALUATE)
<b>CO2</b>	CO2: Formulate database using relational algebra and organize relation using normalization.	IV(ANALYZE)
<b>CO3</b>	CO3: Design SQL queries and implement PL/SQL.	VI (CREATE)
<b>CO4</b>	CO4: Classify the storage and file structure, storage access, indexing and hashing techniques of the database.	III (APPLY)
<b>CO5</b>	CO5: Explain the concept of Transactions, recovery system, and concurrency control.	II(UNDERSTAND)

**Table1: CO,PO,PSOMAPPING**



DEPARTMENT:

SUBJECT:

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P.S01	P.S02	P.S03	P.S04
C01	H	H	H	S	S		S	S	H	S	H	H
C02	H		H	H		H	H	S		H		H
C03	H	S	H	H	H		H	H	H	H	S	H
C04	H		H	H	S	H	H	S	S	H		S
C05	H	H	H	H	S	S	S	H		H	H	H

H: Highly Supportive  
S: Supportive

**H:HighlySupportive**

**S:Supportive**

**Table2:COURSEOUTCOMEATTAINMENT**

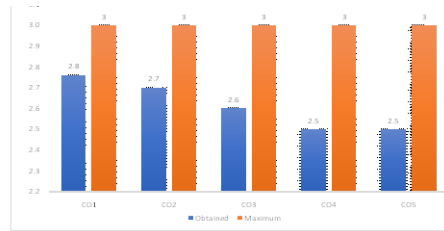
**ATTAINMENTSCALE:**

Pass percent of 85% and above= 3

Passpercentbetween75%-85%=2

Passpercentbetween75%-65%=1

Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	co wise total average
CO1	91.3	3.0			100.0	3.0	100.0	3.0	100.0	3.0	52.2	0.0	2.4	87.0	3.0	3.0	2.8
CO2	91.3	3.0			100.0	3.0			100.0	3.0	52.2	0.0	2.3	87.0	3.0	3.0	2.7
CO3	91.3	3.0	71.7	1.0	100.0	3.0			100.0	3.0	52.2	0.0	2.0	87.0	3.0	3.0	2.6
CO4			71.7	1.0	100.0	3.0			100.0	3.0	52.2	0.0	1.8	87.0	3.0	3.0	2.5
CO5			71.7	1.0	100.0	3.0			100.0	3.0	52.2	0.0	1.8	87.0	3.0	3.0	2.5

AVERAGE	AVERAGE
3	2.612

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

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

**Table3:PROGRAMMEOUTCOMEMAPPING**

**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	H 2.7		H 2.7	H 2.7	
CO3	H 2.6		H 2.6	H 2.6	H 2.6		H 2.6	H 2.6
CO4	H 2.5		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				H 2.5
AVERAGE OF COS FOR POS	2.612	2.63	2.612	2.575	2.6	2.6	2.6	2.55
AVERAGE OF POS	2.5824	2.565	2.5824	2.575	2.6	2.6	2.6	2.55
AVERAGE	2.58185							

## COURSEOUTCOMEMAPPING

### MAPPINGCOURSEOUTCOMESLEADINGTOTHEATTAINMENTOFPROGRAMOUTCOMES

**COURSE TITLE : PROCESS MANAGEMENT**

**COURSE CODE: CSC21405**

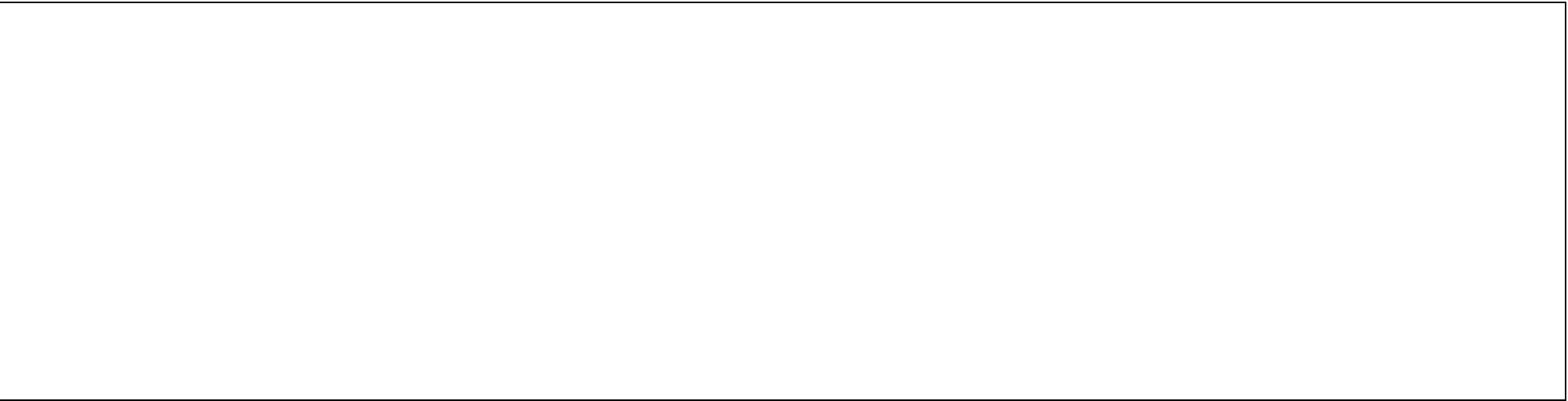
**CREDITS:4**

**DEPARTMENT:B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### **Programme Outcomes – (B.Sc.)**

B.Sc.:

- **PO1.** Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2.** Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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):**

**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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	CO1: Explain Basics Of Software Engineering Process Models	II(UNDERSTANDING)
<b>CO2</b>	CO2: Understand Agile Methodologies And Scrum Roles	II(UNDERSTANDING)
<b>CO3</b>	CO3: Demonstrate Agile And DevOps	III(APPLYING)
<b>CO4</b>	CO4: Explain Lean UX And Agile Anti-Patterns	II(UNDERSTANDING)
<b>CO5</b>	CO5: Classify Design And Lean Thinking	IV(CREATING)

**Table1: CO,PO,PSOMAPPING**



DEPARTMENT: Bsc computer science and cognitive systems

SUBJECT: process management

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

H: Highly Supportive  
S: Supportive

**Table2: COURSE OUTCOME ATTAINMENT**

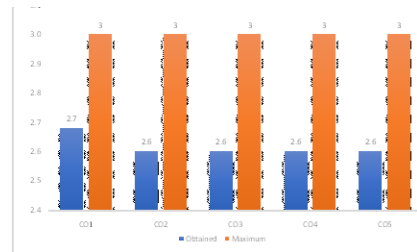
**ATTAINMENT SCALE:**

Pass percent of 85% and above= 3

Pass percent between 75%-85%=2

Pass percent between 65%-75%=1

Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			co wise total average
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	
CO1	78.3	2.0			100.0	3.0	100.0	3.0	93.5	3.0	17.4	0.0	2.2	95.7	3.0	3.0	2.7
CO2	78.3	2.0			100.0	3.0			93.5	3.0	17.4	0.0	2.0	95.7	3.0	3.0	2.6
CO3	78.3	2.0	84.8	2.0	100.0	3.0			93.5	3.0	17.4	0.0	2.0	95.7	3.0	3.0	2.6
CO4			84.8	2.0	100.0	3.0			93.5	3.0	17.4	0.0	2.0	95.7	3.0	3.0	2.6
CO5			84.8	2.0	100.0	3.0			93.5	3.0	17.4	0.0	2.0	95.7	3.0	3.0	2.6

AVERAGE	AVERAGE
3	2.616

**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 midsemester exam needs to improve to improve overall course outcome attainment level.

**Table3:PROGRAMMEOUTCOMEMAPPING**

**Instruction:**

**10. Copythecompletedtable1.**

**11. Retain onlythePOsandtheHighly supportive(H)points.[DeletethePSOcolumnsandthe‘S’points]**

**12. WritetherespectiveCO-wisototalaverage(column Kintable2)wherevereach COismapped as(H)undereachPO.]**



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.68	H 2.68	H 2.68					
CO2	H 2.6		H 2.6	H 2.6		H 2.6	H 2.6	
CO3	H 2.6		H 2.6	H 2.6	H 2.6		H 2.6	H 2.6
CO4	H 2.6		H 2.6	H 2.6		H 2.6	H 2.6	
CO5	H 2.6	H 2.6	H 2.6	H 2.6				H 2.6
AVERAGE OF COS FOR POS	2.616	2.64	2.616	2.6	2.6	2.6	2.6	2.6
AVERAGE OF POS	2.6032	2.62	2.6032	2.6	2.6	2.6	2.6	2.6
AVERAGE	2.6033							

## **COURSE OUTCOMEMAPPING**

### **MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES**

**COURSE TITLE : JAVA PROGRAMMING**

**COURSE CODE : CSC21406**

**CREDITS:4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### **Programme Outcomes – (B.Sc.)**

B.Sc.:

- **PO1.** Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2.** Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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):**

**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.

	<b>COURSEOUTCOMES</b>	<b>BLOOM'STAXONOMYLEVEL</b>
<b>CO1</b>	CO1: Understand fundamentals of object oriented concept, classes, objects and methods	II (UNDERSTAND)
<b>CO2</b>	CO2: Apply inheritance, packages and exceptional handling techniques	III(APPLY)
<b>CO3</b>	CO3: Demonstrate Threads and applet programming.	V(EVALUATE)
<b>CO4</b>	CO4: Express event handling and swing components.	IV(ANALYZE)
<b>CO5</b>	CO5: Design interactive programs using swing	VI(CREATE)

**Table1:CO,PO,PSOMAPPING**



DEPARTMENT:

SUBJECT:

outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
CO1	H	H	H	S	S		S	S	H	S	H	H
CO2	H		H	H		H	H	S		H		H
CO3	H	S	H	H	H		H	H	H	H	S	H
CO4	H		H	H	S	H	H	S	S	H		S
CO5	H	H	H	H	S	S	S	H		H	H	H

H: Highly Supportive  
S: Supportive

**H:HighlySupportive**

**S:Supportive**

## Table2: COURSE OUTCOME ATTAINMENT

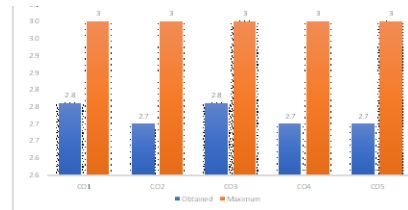
### ATTAINMENT SCALE:

Pass percent of 85% and above= 3

Pass percent between 75%-85%=2

Pass percent between 65%-75%=1

Pass percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			co wise total average
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	
CO1	97.8	3.0			100.0	3.0	95.7	3.0	91.3	3.0	43.5	0.0	2.4	87.0	3.0	3.0	2.8
CO2	97.8	3.0			100.0	3.0			91.3	3.0	43.5	0.0	2.3	87.0	3.0	3.0	2.7
CO3	97.8	3.0	87.0	3.0	100.0	3.0			91.3	3.0	43.5	0.0	2.4	87.0	3.0	3.0	2.8
CO4			87.0	3.0	100.0	3.0			91.3	3.0	43.5	0.0	2.3	87.0	3.0	3.0	2.7
CO5			87.0	3.0	100.0	3.0			91.3	3.0	43.5	0.0	2.3	87.0	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 midsemester exam needs to improve to improve overall course outcome attainment level.

**Table3:PROGRAMMEOUTCOMEMAPPING**

**Instruction:**

**13. Copy the completed table 1.**

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

**15. 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	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	H 2.76
CO4	H 2.7		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				H 2.7
AVERAGE OF COS FOR POS	2.724	2.73	2.724	2.715	2.76	2.7	2.72	2.73
AVERAGE OF POS	2.7168	2.715	2.7168	2.715	2.76	2.7	2.72	2.73
AVERAGE	2.7217							

**COURSE OUTCOMEMAPPING**

**MAPPINGCOURSEOUTCOMESLEADINGTOTHEATTAINMENTOFPROGRAMOUTCOMES**

**COURSE TITLE : PRINCIPLES OF INFORMATION SECURITY**

**COURSE CODE: CSC22601A**

**CREDITS:4**

**DEPARTMENT :B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

Program Outcomes–(B.Sc.) B.Sc.:

- PO1.Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- PO2.Design/developmentofsolutions:Designsolutionsforcomplexengineeringproblemsanddesignsystemcomponentsor

Processes that meet The specified needs with appropriate consideration for the public health and safety ,and the cultural, societal, and environmental

considerations.

- PO3.Problemanalysis: Identify, formulate ,research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO4.Moderntoolusage: Create ,select andapplyappropriatetechniques,resources,moderntechnologyandITtoolsto complex science and technological activities.
- PO5.Environmentandsustainability: Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- PO6.Individualandteamwork: Function objectively as an individual and a 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-longlearning: Recognize the need and ability To engage in independent and lifelong learning in the context of technological change.

#### **PROGRAMMESPECIFICOUTCOMES (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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1: Explain concept of Security System Development Lifecycle, Need for Security</b>	II(UNDERSTAND)
<b>CO2</b>	<b>CO2: Identify the risk, assess and risk control strategies.</b>	I(REMEMBER)

<b>CO4</b>	<b>CO4: Analyze systems ,tools, methods, and techniques for securing digital information within an organization</b>	IV(ANALYZE)
<b>CO5</b>	<b>CO5: Explain the concepts of Security Considerations in Mobile and Wireless Computing</b>	II(UNDERSTAND)
<b>CO3</b>	<b>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</b>	III(APPLY)

**Table1: CO,PO,PSOMAPPING**

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

H: Highly Supportive  
S: Supportive

**Table2: COURSE OUTCOME ATTAINMENT**

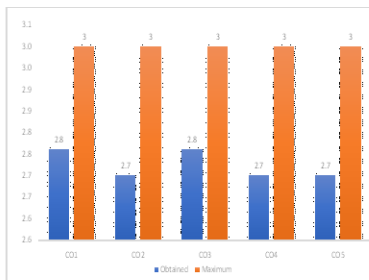
**ATTAINMENT SCALE:**

**Pass percent of 85% and above= 3**

**Pass percent between 75%-85%=2**

**Pass percent between 65%-75%=1**

**Pass percent of less than 65%=0**



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			co wise total average
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	
CO1	96.4	3.0			100.0	3.0	100.0	3.0	96.4	3.0	35.7	0.0	2.4	100.0	3.0	3.0	2.8
CO2	96.4	3.0			100.0	3.0			96.4	3.0	35.7	0.0	2.3	100.0	3.0	3.0	2.7
CO3	96.4	3.0	96.4	3.0	100.0	3.0			96.4	3.0	35.7	0.0	2.4	100.0	3.0	3.0	2.8
CO4			96.4	3.0	100.0	3.0			96.4	3.0	35.7	0.0	2.3	100.0	3.0	3.0	2.7
CO5			96.4	3.0	100.0	3.0			96.4	3.0	35.7	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 midsemester exam needs to improve to improve overall course outcome attainment level.

**Table3:PROGRAMMEOUTCOMEMAPPING**

**Instruction:**

**16. Copy the completed table 1.**

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

**18. 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	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	H 2.7	H 2.7
CO5		H 2.7	H 2.7			H 2.7		
AVERAGE OF COS FOR POS	2.76	2.7	2.72	2.7	2.76	2.7	2.72	2.74
AVERAGE OF POS	2.76	2.7	2.706667	2.7	2.76	2.7	2.706667	2.733333
AVERAGE	2.720833333							

## COURSE OUTCOMEMAPPING

### MAPPINGCOURSEOUTCOMESLEADINGTOTHEATTAINMENTOFPROGRAMOUTCOMES

**COURSE TITLE : COGNITIVE COMPUTING**

**COURSE CODE : CSC22601B**

**CREDITS:4**

**DEPARTMENT:B.Sc.COMPUTERSCIENCE&COGNITIVESYSTEMS**

#### ProgrammeOutcomes–(B.Sc.)

B.Sc.:

- **PO1.** Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2.** Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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.

**PROGRAMMESPECIFICOUTCOMES (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.

	<b>COURSEOUTCOMES</b>	<b>BLOOM'STAXONOMYLEVEL</b>
<b>CO1</b>	<b>CO1:</b> Understand the fundamental concepts of cognitive computing	<b>II (UNDERSTAND)</b>
<b>CO2</b>	<b>CO2:</b> Recognize the use of cognitive computing in various industries	<b>I(REMEMBER)</b>
<b>CO3</b>	<b>CO3:</b> Understand the principles of NLP in cognitive computing	<b>II (UNDERSTAND)</b>
<b>CO4</b>	<b>CO4:</b> Understand the principles of cloud & cognitive computing	<b>II (UNDERSTAND)</b>
<b>CO5</b>	<b>CO5:</b> Create and build the cognitive application and understand their usages.	<b>V(CREATE)</b>

**Table1: CO,PO,PSOMAPPING**

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

H: Highly Supportive  
S: Supportive

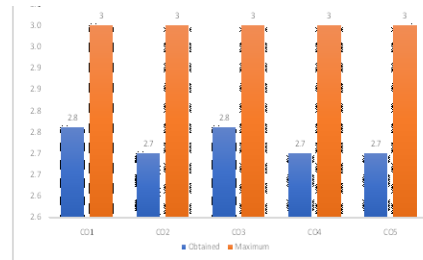
**H:HighlySupportive**

**S:Supportive**

**Table2:COURSEOUTCOMEATTAINMENT**

**ATTAINMENTSCALE:**

- Pass percent of 85% and above= 3
- Passpercentbetween75%-85%=2
- Passpercentbetween75%-65%=1 Pass
- percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		External Exam				
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	91.7	3.0			100.0	3.0	100.0	3.0	100.0	3.0	45.8	0.0	2.4	95.8	3.0	3.0	2.8
CO2	91.7	3.0			100.0	3.0			100.0	3.0	45.8	0.0	2.3	95.8	3.0	3.0	2.7
CO3	91.7	3.0	100.0	3.0	100.0	3.0			100.0	3.0	45.8	0.0	2.4	95.8	3.0	3.0	2.8
CO4			100.0	3.0	100.0	3.0			100.0	3.0	45.8	0.0	2.3	95.8	3.0	3.0	2.7
CO5			100.0	3.0	100.0	3.0			100.0	3.0	45.8	0.0	2.3	95.8	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

**RESULTANALYSIS: (OnlywriteacommentonthetotalCOattainmentforthecourse andareasofimprovement, howlessit isfrom3, which exam are they losing marks in, how can we attain 3)**

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

**Table3:PROGRAMMEOUTCOMEMAPPING**

**Instruction:**

- 1. Copythecompletedtable1.**
- 2. RetainonlythePOsandtheHighlysupportive(H)points.[DeletethePSOcolumnsandthe ‘S’points]**
- 3. WritetherespectiveCO-wisetotalaverage(column Kintable2)wherevereach COismapped as(H)undereachPO.]**



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.76		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 2.7	H 2.7		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	2.7	2.72	2.7	2.76	2.7	2.72	2.74
AVERAGE OF POS	2.76	2.7	2.706667	2.7	2.76	2.7	2.706667	2.733333
AVERAGE	2.720833333							

**COURSE OUTCOMEMAPPING**

**MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES**

**COURSE TITLE : INFRASTRUCTURE SECURITY**

**COURSE CODE : CSC22602A**

**CREDITS:4**

**DEPARTMENT: B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

**Programme Outcomes – (B.Sc.)**

B.Sc.:

- **PO1.** Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2.** Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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.



**PROGRAMMESPECIFICOUTCOMES (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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1: Understand the concept of attacks and security protection mechanisms.</b>	II(UNDERSTAND)
<b>CO2</b>	<b>CO2: Analyze and evaluate attacks on databases and cloud.</b>	IV(ANALYZE)
<b>CO3</b>	<b>CO3: Explain the need for OS and multilevel security.</b>	III(APPLY)
<b>CO4</b>	<b>CO4: Explain various risk assessment and IT security.</b>	II(UNDERSTAND)
<b>CO5</b>	<b>CO5: Evaluate different attacks on open web applications.</b>	V(EVALUATE)

**Table1: CO,PO,PSO MAPPING**

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

H: Highly Supportive  
S: Supportive

**Table2:COURSEOUTCOMEATTAINMENT**

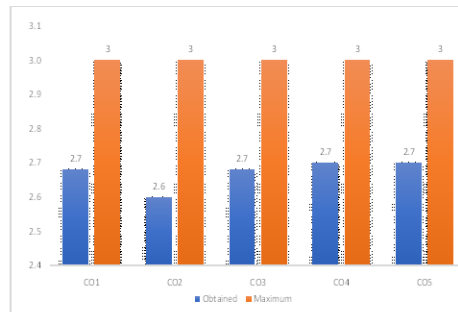
**ATTAINMENTSCALE:**

Pass percent of 85% and above= 3

Passpercentbetween75%-85%=2

Passpercentbetween75%-65%=1 Pass

percent of less than 65%= 0



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		co wise external average	co wise total average		
CO1	82.6	2.0			100.0	3.0	100.0	3.0	100.0	3.0	21.7	0.0	2.2	87.0	3.0	3.0	2.7
CO2	82.6	2.0			100.0	3.0			100.0	3.0	21.7	0.0	2.0	87.0	3.0	3.0	2.6
CO3	82.6	2.0	95.7	3.0	100.0	3.0			100.0	3.0	21.7	0.0	2.2	87.0	3.0	3.0	2.7
CO4			95.7	3.0	100.0	3.0			100.0	3.0	21.7	0.0	2.3	87.0	3.0	3.0	2.7
CO5			95.7	3.0	100.0	3.0			100.0	3.0	21.7	0.0	2.3	87.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.672

**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.

**Table3:PROGRAMMEOUTCOMEMAPPING**

**Instruction:**

**19. Copythecompletedtable1.**

**20. RetainonlythePOsandtheHighlysupportive(H)points.[DeletethePSOcolumnsandthe ‘S’points]**

**21. WritetherespectiveCO-wisetotalaverage(column Kintable2)wherevereach COismapped as(H)undereachPO.]**



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.68	H 2.68	H 2.68					
CO2	H 2.6		H 2.6	H 2.6		H 2.6	H 2.6	
CO3	H 2.68		H 2.68	H 2.68	H 2.68		H 2.68	H 2.68
CO4	H 2.7		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				H 2.7
AVERAGE OF COS FOR POS	2.672	2.69	2.672	2.67	2.68	2.65	2.66	2.69
AVERAGE OF POS	2.6704	2.695	2.6704	2.67	2.68	2.65	2.66	2.69
AVERAGE	2.673225							

## COURSE OUTCOMEMAPPING

### MAPPINGCOURSEOUTCOMESLEADINGTOTHEATTAINMENTOFPROGRAMOUTCOMES

**COURSE TITLE : ITINFRASTRUCTURE LIBRARY**

**COURSE CODE : CSC22602B**

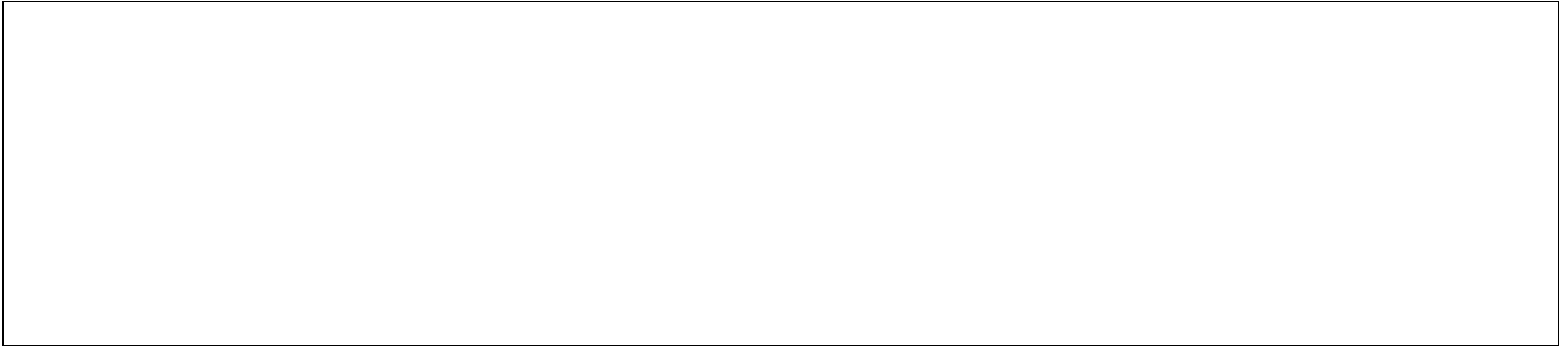
**CREDITS: 4**

**DEPARTMENT:B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### ProgrammeOutcomes–(B.Sc.)

B.Sc.:

- **PO1.** Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2.** Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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.



**PROGRAMMESPECIFICOUTCOMES (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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1:</b> Understand Service Life Cycle Model.	II(UNDERSTAND)
<b>CO2</b>	<b>CO2:</b> Know the key principles, models, and concepts of service management.	I(REMEMBER)
<b>CO3</b>	<b>CO3:</b> Understand process management and risk management.	II(UNDERSTAND)
<b>CO4</b>	<b>CO4:</b> Know the challenges in providing IT infrastructure services.	I(REMEMBER)
<b>CO5</b>	<b>CO5:</b> Understand the event management concepts.	II(UNDERSTAND)

**Table1: CO,PO,PSOMAPPING**

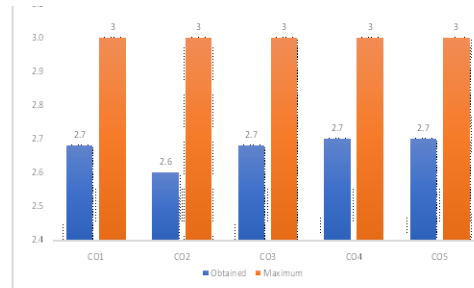
outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02	PS03	PS04
C01	H	S	H	S	S	S	H	H	H	S	H	S
C02	S	S	S	H	S	H	H	S	S	H	H	S
C03	H	S	H	S	H	S	S	H	H	S	S	H
C04	S	S	S	H	S	H	H	H	S	H	H	S
C05	S	H	H	S	S	H	S	S	S	H	H	H

H: Highly Supportive  
S: Supportive

**Table2: COURSE OUTCOME ATTAINMENT**

**ATTAINMENT SCALE:**

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



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		co wise internal average	External Exam			co wise total average
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	
CO1	80.0	2.0			100.0	3.0	100.0	3.0	100.0	3.0	55.0	0.0	2.2	100.0	3.0	3.0	2.7
CO2	80.0	2.0			100.0	3.0			100.0	3.0	55.0	0.0	2.0	100.0	3.0	3.0	2.6
CO3	80.0	2.0	100.0	3.0	100.0	3.0			100.0	3.0	55.0	0.0	2.2	100.0	3.0	3.0	2.7
CO4			100.0	3.0	100.0	3.0			100.0	3.0	55.0	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	55.0	0.0	2.3	100.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.672

**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.

**Table3:PROGRAMMEOUTCOMEMAPPING**

**Instruction:**

**22. Copythecompletedtable1.**

**23. RetainonlythePOs andtheHighlysupportive(H)points.[DeletethePSOcolumnsandthe‘S’points]**

**24. WritetherespectiveCO-wisetotalaverage(column Kintable2)wherevereach COismapped as(H)undereachPO.]**



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
C01	H 2.68		H 2.68				H 2.68	H 2.68
C02				H 2.6		H 2.6	H 2.6	
C03	H 2.68		H 2.68		H 2.68			H 2.68
C04				H 2.7		H 2.7	H 2.7	H 2.7
C05		H 2.7	H 2.7			H 2.7		
AVERAGE OF COS FOR POS	2.68	2.7	2.68666667	2.65	2.68	2.66666667	2.66	2.68666667
AVERAGE OF POS	2.68	2.7	2.68889	2.65	2.68	2.66667	2.653333	2.68889
AVERAGE	2.675972222							

## **COURSE OUTCOMEMAPPING**

### **MAPPINGCOURSEOUTCOMESLEADINGTOTHEATTAINMENTOFFPROGRAMOUTCOMES**

**COURSE TITLE : BIG DATA ANALYTICS**

**COURSE CODE : CSC22603**

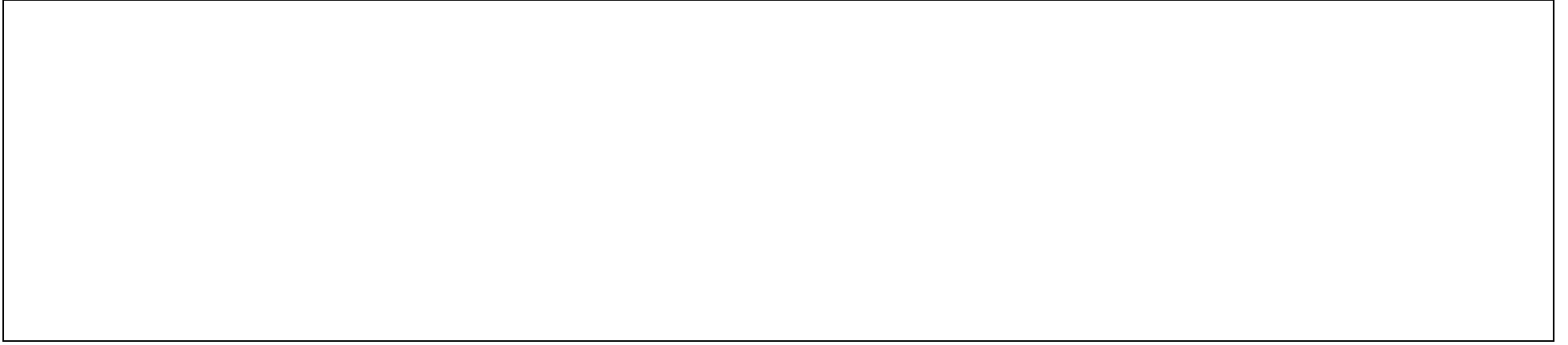
**CREDITS:4**

**DEPARTMENT:B.Sc. COMPUTER SCIENCE & COGNITIVE SYSTEMS**

#### **ProgrammeOutcomes–(B.Sc.)**

B.Sc.:

- **PO1.** Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2.** Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for 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 Teamwork: 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 be 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.



**PROGRAMMESPECIFICOUTCOMES (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.

	<b>COURSE OUTCOMES</b>	<b>BLOOM'S TAXONOMY LEVEL</b>
<b>CO1</b>	<b>CO1:</b> The student will demonstrate knowledge of Big Data, and will be able to analyze the data to deliver an effective data model using various big data technologies.	<b>III (APPLY)</b>

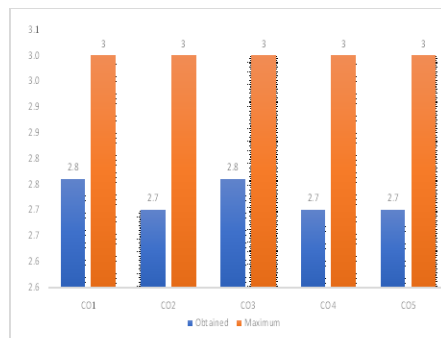
**Table1: CO,PO,PSOMAPPING**

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

**Table2: COURSE OUTCOME ATTAINMENT**

**ATTAINMENT SCALE:**

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



co	mid exam 1		mid exam 2		group discussion		assignment		viva		Attendance		External Exam			co wise total average	
	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	93.8	3.0			100.0	3.0	100.0	3.0	89.6	3.0	31.3	0.0	2.4	100.0	3.0	3.0	2.8
CO2	93.8	3.0			100.0	3.0			89.6	3.0	31.3	0.0	2.3	100.0	3.0	3.0	2.7
CO3	93.8	3.0	97.9	3.0	100.0	3.0			89.6	3.0	31.3	0.0	2.4	100.0	3.0	3.0	2.8
CO4			97.9	3.0	100.0	3.0			89.6	3.0	31.3	0.0	2.3	100.0	3.0	3.0	2.7
CO5			97.9	3.0	100.0	3.0			89.6	3.0	31.3	0.0	2.3	100.0	3.0	3.0	2.7

AVERAGE	AVERAGE
3	2.724

**RESULT ANALYSIS: (Only write 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.

**Table3:PROGRAMMEOUTCOMEMAPPING**

**Instruction:**

**25. Copythecompletedtable1.**

**26. RetainonlythePOs  
andtheHighlysupportive(H)points.[DeletethePSOcolumnsandthe‘S’points]**

**27. WritetherespectiveCO-wisetotalaverage(column Kintable2)wherevereach COismapped  
as(H)undereachPO.]**



OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H 2.76		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			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		
AVERAGE OF COS FOR POS	2.76	2.7	2.74	2.7	2.76	2.7	2.72	2.74
AVERAGE OF POS	2.76	2.7	2.733333	2.7	2.76	2.7	2.706667	2.733333
AVERAGE	2.724166667							