

### SCHOOL OF ENGINEERING AND TECHNOLOGY Master of Computer Applications

**Programme Code: SET0105 Duration- 3 Years Full Time** 

### PROGRAM STRUCTURE AND CURRICULUM & SCHEME OF EXAMINATION 2019-20

# Program and Course Structure

# School of Engineering Technology Master in Computer Application (MCA) 2019 ADMISSION BATCH

#### 1. Standard Structure of the Program at University Level

#### 1.1 Vision, Mission and Core Values of the University

#### Vision of the University

To serve the society by being a global University of higher learning in pursuit of academic excellence, innovation and nurturing entrepreneurship.

#### **Mission of the University**

- 1. Transformative educational experience
- 2. Enrichment by educational initiatives that encourage global outlook
- 3. Develop research, support disruptive innovations and accelerate entrepreneurship

**Core Values** 

4. Seeking beyond boundaries

- Integrity
- Leadership
- Diversity
- Community

#### Vision of the School

To become a globally acclaimed institution of higher learning in engineering and technology promoting excellence in research, innovation and entrepreneurship

#### **Mission of the School**

- 1. To impart quality education with strong industry & academic connectivity in the expanding fields of Engineering and Technology in a conductive and enriching learning environment.
- 2. To product technocrats equipped with technical & soft skills and experiential learning required to stay current with the modern tools in emerging technologies to fulfill professional responsibilities and uphold ethical values.
- 3. To inculcate a culture of interdisciplinary research, innovation and entrepreneurship to provide sustainable solutions to meet the growing challenges and societal needs.
- 4. To foster collaborative learning and to play adaptive leadership role in professional career and pursuit of higher education through effective mentoring and counselling.

#### Vision of the Department

To be known and recognized as the fountainhead of excellence in technical knowledge and research in computer science and engineering, and draw to it the students and scholars across nations.

#### **Mission of the Department**

- 1. To facilitate and foster the academia industry collaboration to enhance entrepreneurship skills and acquaintance with corporate culture.
- 2. To strengthen core competences of students to be successful, ethical, effective problem solver in Computer Science & Engineering through analytical learning
- 3. To promote research based activities in emerging areas of technology convergence.
- 4. To induce moral values and spirit of social commitment.

#### **1.3 Programme Educational Objectives (PEO)**

#### **1.3.1** Writing Programme Educational Objectives (PEO)

#### The Educational Objectives of UG Program in Computer Science Engineering are:

**PEO1 :** The Graduate will ensconce himself/herself as effective professionals by solving real life problems using exploratory and analytical skills along with the knowledge acquired in the field of Computer Science and Engineering.

**PEO2** :The Graduate will demonstrate his/her ability to accustom to rapidly changing environment in advanced areas of Computer Science and scale new height in their profession through lifelong learning.

**PEO3 :** The Graduate will have the ability to work and communicate effectively as a team member or leader to complete the task with minimal resources, meeting deadlines.

**PEO4 :** The Graduate will embrace professional code of ethics in the profession while deliberately being part of projects which contributes to the society at large without disturbing the ecological balance.

#### **Methods of Forming PEO's**

- STEP 1: The needs of the Nation and society are identified through scientific publications, industry interaction and media.
- STEP 2. Taking the above into consideration, the PEOs are established by the coordination Committee of the department.
- STEP 3. The PEOs are communicated to the alumni and their suggestions are obtained.
- STEP 4. The PEOs are communicated to all the faculty members of the department and their feedback is obtained.
- STEP 5. The PEOs are then put to the Board of Studies of the department for final approval.

#### **1.3.2** Map PEOs with School Mission Statements:

PEO	School	School	School	School Mission 4	
Statements	Mission 1	Mission 2	Mission 3		
PEO1:	3	3	2	2	
PEO2:	2	3	2	1	
PEO3:	2	2	2	3	
PEO4:	2	1	3	1	

Enter correlation levels 1, 2, or 3 as defined below:

#### 1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

If there is no correlation, put "-"

#### **1.3.2.1 Map PEOs with Department Mission Statements:**

PEO	Department	Department	Department	Department
Statements	Mission 1	Mission 2	Mission 3	Mission 4
PEO1:	2	3	2	1
PEO2:	1	3	3	1
PEO3:	3	2	1	1
PEO4:	1	2	2	3
PEO5:	2	3	2	1

Enter correlation levels 1, 2, or 3 as defined below:

1. Slight (Low) 2. Moderate

2. Moderate (Medium)

3. Substantial (High)

If there is no correlation, put "-"

#### **1.3.3 Program Outcomes (PO's)**

PO1: Recognition of the need for and ability to engage in continuing professional development.

PO2: An ability to use appropriate techniques, skills, and tools necessary for computing practice.

PO3: An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computational systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

PO4: An ability to apply design and development principles in the construction of software systems of varying complexity.

PO5: Proficiency with fundamental knowledge in at least one area of research.

PO6: Ability to apply reasoning, problem solving, and technical skills to solve a problem with minimal guidance.

PO7: Ability to communicate concepts and results to a technical audience in the form of a technical report and/or an oral presentation to a review committee.

PSO1: To gain the fundamental knowledge in algorithms, programming languages, and architecture.

PSO2: To become Proficient in fundamental knowledge in several specialized areas of research and expertise in at least one area of research.

PSO3: To apply reasoning, problem solving, and technical skills to solve problems with minimal guidance, and to conduct independent and innovative research.

PSO4: To communicate concepts and results to a technical audience in the form of conference papers, journal papers, and/or oral presentations.

Mapping	PEO1	PEO2	PEO3	PEO4	PEO5
PO1	1	3	2	3	3
PO2	2	3	3	3	2
PO3	3	2	3	3	1
PO4	2	1	3	1	2
PO5	2	3	1	2	3
PO6	1	2	2	3	3
PO7	3	2	3	3	1

### **1.3.4 Mapping of Program Outcome Vs Program Educational Objectives**

1. Slight (Low)

2. Moderate (Medium)

3. Substantial (High)

	School of Engineering and Technology									
MCA										
	I	Batch: 2019 Onwards					TERM: I			
S.	Course Code	Course		eachiı Load	ng	Credits	Pre-Requisite/Co Requisite			
INO.				Т	Р					
THEO	RY SUBJECTS	5		-						
1	MCA161	Introduction to C Programming	3	1	0	4	NEW			
2	MCA162	Digital Electronics	3	0	0	3	NEW			
3	MCA163	Fundamental of Information Technology	3	0	0	3	NEW			
4	MTH133	Mathematical Foundation of computer science	3	1	0	4	NEW			
Practi	cal/Viva-Voce/J	ury								
5	ARP101	Communicative English-1	1	0	2	2				
6	MCP161	Introduction to C Programming Lab	0	0	2	1				
7 MCP162 Digital Electronics Lab		0	0	2	1					
TOT	AL CREDITS					18				

	School of Engineering and Technology									
MCA										
	I	Batch: 2019 Onwards					TERM: II			
S.	Course Code	Course		Teaching Load		Credits	Pre-Requisite/Co Requisite			
INO.				Т	Р					
THEO	RY SUBJECTS	<b>b</b>		-						
1	MCA164	Object oriented programming with JAVA	3	1	0	4				
2	MCA165	System Analysis and Design	3	0	0	3				
3	MCA166	Computer Organization and Architecture	3	0	0	3				
4	MTH128	Numerical Analysis	3	0	0	3				
5	HMM207	Management Concepts & Practices	3	0	0	3				
Practi	cal/Viva-Voce/J	ury								
6	ARP102	Communicative English -2	1	0	2	2				
7	MCP164	Object oriented programming with JAVA Lab	0	0	2	1				
8 MTH153 Numerical Analysis Lab			0	0	2	1				
TOT	AL CREDITS					20				

	School of Engineering and Technology									
		MCA								
	Batch: 2019 Onwards TERM: III									
S.	Course Code	Course		eachiı Load	ng	Credits	Pre-Requisite/Co Requisite			
No.				Т	Р					
THEC	ORY SUBJECT	S								
1	MCA261	JAVA Programming	3	0	0	3	OOPS			
2	2 MCA262 Introduction to Computer Networks		3	0	0	3				
3	MCA263	Principles of Database Management Systems	3	0	0	3				
4	MCA264	Operating System Concept	3	0	0	3				
5	MCA265	Data Structures	3	0	0	3				
Practi	cal/Viva-Voce/J	lury								
6	ARP203	Logical Skills Building and Soft Skills	1	0	2	2				
7	MCP261	JAVA Programming Lab	0	0	2	1				
8	MCP262	Introduction to Computer Networks Lab	0	0	2	1				
9	MCP263	Principles of Database Management Systems Lab	0	0	2	1				
10	10         MCP 264         Operating System Concept Lab		0	0	2	1				
11         MCP265         Data Structures Lab			0	0	2	1				
TOT	AL CREDITS					22				

	School of Engineering and Technology									
		MCA								
	Batch: 2019 Onwards TERM: IV									
S. No.	Course Code	Course		Teaching Load			Pre-Requisite/Co Requisite			
				T	Р					
THE	ORY SUBJEC	rs								
1	MCA266	Software Engineering Principles	3	0	0	3				
2	MCA267	Design and analysis of algorithms	3	1	0	4				
3	MCA270	Computer Graphics and Animation	3	1	0	4				
		Program Elective -1								
4	MCA268	Advanced Database Management Systems Mobile Technologies		0	0	3				
	MCA269									
		Program Elective -2								
5	MCA273	Data Mining & Knowledge discovery	2	0						
5	MCA271	Cloud Computing	3	0	0	3				
	MCA272	Android Application Development								
Pract	ical/Viva-Voce	/Jury								
6	ARP204	Quantitative and Qualitative Aptitude Sill Building	1	0	2	2				
7	MCP267	Design and analysis of algorithms Lab	0	0	2	1				
8	MCP270	Computer Graphics and Animation Lab	0	0	2	1				
TOT	AL CREDITS					21				

		School of Engineering and	I Tec	hnolo	ogy		
		MCA					
		Batch: 2019 Onwards					TERM: V
S. No.	Course Course				ng	Credit s	Pre-Requisite/Co Requisite
			L	Т	P	-	
THE	DRY SUBJECT	l'S	1	1	1		Γ
1	MCA361	Python Programming Concepts	3	0	0	3	
2	MCA362	Web and its Applications	3	0	0	3	
		Program Elective-3					
2	MCA363	Business Intelligence	2			2	
3	MCA364	Cryptography and Network Security	- 3	0	0	3	
	MCA365	Software Project Management					
		Program elective-4				3	
4	MCA366	Big Data Analytics	2		0		
4	MCA367	Cyber Laws	3	0			
	MCA368	Software Testing					
5	ENG401	Writing for Technical Purpose	3	0	0	3	
Practi	ical/Viva-Voce/	/Jury					
6	ARP301	Personality Development and Decision making Skills	1	0	2	2	
7	MCP361	Python Programming Concepts Lab	0	0	2	1	
8	MCP362	Web and its Applications Lab	0	0	2	1	
9	MCP301	Mini Project	0	0	2	1	
ΤΟΤ	AL CREDITS					20	

		School	l of I	Engi	neeri	ng and Tecl	nology		
					MC	CA			
Batch: 2019 Onwards TERM: VI									
S. No.	Course Code	Course	Teaching Load		Credits	Pre-Requisite/Co Requisite			
			L	Т	Р				
THEORY	Y SUBJECTS/ Practica	l/Viva-Voce/J	ury						
1	MCA354	Seminar	0	0	8	4			
2	MCA356	Project	0	0	30	15			
ТО	TOTAL CREDITS 19								

	MCA PE-1		MCA PE-2		MCA PE-3	MCA PE-4	
MCA2	Advanced Database	MCA2	Data Mining & Knowledge	MCA3	Pusiness Intelligence	MCA3	Big Data
68	Management Systems	73	discovery	63 Business Intelligence		66	Analytics
MCA2	Mahila Tashaalasiya MC/		MCA2 Claud Computing		Cryptography and	MCA3	Cychan Larva
69	woone rechnologies	71	Cloud Computing	64	Network Security	67	Cyber Laws
		MCA2	Android Application	MCA3	Software Project	MCA3	Software
		72	Development	65	Management	68	Testing

# **Course Modules**

# Semester I

Sc	hool: SET	Batch : 2019						
Pr	ogram: MCA	Current Academic Year: 2019-20						
Br	ranch:	Semester: I						
1	Course Code	MCA161 Course Name: Programming in C						
2	Course Title	Introduction to C Programming						
3	Credits	4						
4	Contact Hours	3-1-0						
	(L-T-P)							
	Course Status	PG						
5	Course Objective	1. Learn basic programming constructs –data typ decision structures, control structures in C	es,					
		2. learning logic aptitude programming in c lang	uage					
		3. Developing software in c programming						
6	Course Outcomes	Students will be able to:						
	CO1: Understand core concept of c Programming							
		CO2: Implement Array and String						
		CO3: Implement Functions						
		CO4: Use Union and Structure						
		CO5: Understand and implement Pointers						
7	7 Course Description Programming for problem solving gives the Understanding							
		programming and implement code from flowchart or algor	ithm					
8	Outline syllabus		CO Mapping					
	Unit 1	Introduction to C Programming						
	Α	Introduction to C programming language, Data types, Variables, Constants, Identifiers and keywords,	CO1,					
	В	Storage classes	CO1					
	_	Operators and expressions, Types of Statements:						
		Assignment, Control, jumping.						
	С	Control statements: Decisions, Loops, break, continue	CO1					
	Unit 2	Arrays and Strings						
	Α	Arrays: One dimensional and multi dimensional arrays:	CO2					
	В	Declaration, Initialization and array manipulation	CO2					
	9	(sorting, searching).	GOO					
	C	Strings, String operations, String Functions	CO2					
	Unit 3	Functions	~~~					
	A	Functions: Definition, Declaration/Prototyping and CO3 Calling, Types of functions						
	В	Parameter passing: Call by value, Call by reference. CO3						
	С	Passing and Returning Arrays from Functions, Recursive Functions.	CO3					
	Unit 4	Structure and Unions						
	Α	Structure and Unions: Introduction, Declaration,	CO4					

	Difference, App	lication,							
В	Nested structure	, self referen	tial structure,	CO4					
С	Array of structur	CO4							
Unit 5	Pointers & Fil	Pointers & File Handling							
Α	Pointer: Intro variables, Oper	Pointer: Introduction, declaration of pointer variables, Operations on pointers:							
В	Pointer arithm memory allocat	CO5							
С	Files: Introduction Buffering, Type and random file	CO5							
Mode of examination	Theory								
Weightage Distribution	CA	MTE	ETE						
	30%	20%	50%						
Text book/s*	Kernighan, Brian Language	, and Dennis	Ritchie. The C Programming						
Other References	<ol> <li>B.S. Got Outline 3 2004.</li> <li>E. Balagu Edition -</li> </ol>								

### CO and PO Mapping

S.	Course Outcome	Program Outcomes (PO) &
No.		Program Specific Outcomes
		(PSO)
1.	CO1: Understand core concept of c Programming	PO1,PO2,PO3,PO11,PO12
		PSO1,PSO2,PSO3,PSO4,SPO5
2.	CO2: Implement Array and String	PO1,PO2,PO3,PO11,PO12
		PSO1,PSO2,PSO3,PSO4,SPO5
3.	CO3: Implement Functions	PO1,PO2,PO3,PO11,PO12
		PSO1,PSO2,PSO3,PSO4,SPO5
4.	CO4: Use Union and Structure	PO1,PO2,PO3,PO11,PO12
		PSO1,PSO2,PSO3,PSO4,SPO5
5.	CO5: Understand and implement Pointers	PO1,PO2,PO3,PO11,PO12
	-	PSO1,PSO2,PSO3,PSO4,SPO5

	COs	POI	PO2	PO3	PO4	PO5	PO6	PO7	PO8	909	PO10	P011	P012	PSO1	PSO2	PSO3	PSO4	PSO5
SE107	CO1	3	2	3	-	-	-	-	-	-	-	2	1	3	2	2	1	2
	CO2	3	2	3	-	-	-	-	-	-	-	2	1	3	2	2	1	2
C	CO3	3	2	3	-	-	-	-	-	-	-	1	1	2	3	2	1	2
	CO4	3	2	3	-	-	-	-	-	-	-	3	2	3	2	1	1	1
	CO5	3	2	3	-	-	-	-	-	-	-	3	1	2	2	2	1	3

#### PO and PSO mapping with level of strength for Course Name Introduction to C Programming (Course Code MCA161)

Sch	ool: SET	Batch :2019							
Pro	gram: MCA	Current Academic Year: 2019-20							
Bra	nch: NA	Semester: I							
1	Course Code	MCA162 Course Name: Digital Electronics							
2	Course Title	Digital Electronics							
3	Credits	3							
4	Contact	3-0-0							
	Hours								
	(L-T-P)								
	Course Status	Compulsory							
5	Course	1. To acquire the basic knowledge of digital logic	levels and application of						
	Objective	knowledge to understand digital electronics circuit	its.						
		2. To prepare students to perform the analysis and	design of various digital						
		electronic circuits							
6	Course	Students will be able to:	concepts and techniques						
	Outcomes	used in digital electronics	concepts and techniques						
		<b>CO2:</b> The ability to understand, analyze and design vario	us combinational and						
		sequential circuits.							
		CO3: The ability to identify and prevent various hazards a	and timing problems in a						
		digital design							
7	0	<b>CO4:</b> To develop skill to build, and troubleshoot digital c	ircuits.						
/	Course	Digital Electronics (DE) is the study of electronic circuits and control digital signals as opposed to analog signals th	Digital Electronics (DE) is the study of electronic circuits that are used to process						
	Description	distinction allows for greater signal speed and storage can	abilities and has						
		revolutionized the world electronics. Digital electronics is	the foundation of all						
		modern electronic devices such as cellular phones, MP3 p	olayers, laptop						
		computers, digital cameras, high definition televisions, etc	C.						
8	Outline syllabu	S	CO Mapping						
	Unit 1	Digital Logic Circuits							
	А	Introduction to digital signals, one's complement and	CO1,CO2						
	Л	two s complement, Binary	CO1 CO2						
	В	(NAND NOR XOR XNOR) Universal gates	01,002						
	С	Implementation of Universal gates using basic gates .	CO1 CO4						
	e	De-Morgan's Theorem : Statement and Proof	001,001						
	Unit 2	Boolean Algebra							
	А	Boolean Laws, Simplification of Boolean expression	CO1,CO2						
		using Laws,							
	В	Min terms (SOP) Ma x terms (POS),	C01,C02						
		Standard/Canonical SOP and POS forms							
	С	Kmap(2,3 and 4 variable s), Don't care conditions	CO1,CO2						
	Unit 3	Combinational circuits							
	А	Introduction to combinational circuits, Adder: Half & Full,	C01,C02						
		subtractor: Half & Full							

В	Multiplexer (4	to 1,8 to 1 ,16 t	to 1), Demultiplexer(1 to 4, 1 to	CO1,CO2
	8,1 to 16,			
С	Decoder(1 of 4	,1 of 8, 1 of 16	), encoder( decimal to BCD,	CO1.CO2
	hexadecimal to	BCD)		
Unit 4	Sequential Cir	cuits		
А	What is sequer	ntial circuits? I	CO1.CO2.CO3.CO4	
	and NOR), cloc	, , ,		
В	D Flip flop, JK	Flip Flop, T F	lip Flop	C01,C02,C03,C04
С	Registers: buffe	er register, shif	t left register, shift right	CO1.CO2.CO3.CO4
-	register, applica	ations		
Unit 5	Counters			
А	Counters, ne	ed of cou	nter, types-synchronous &	CO1,CO2,CO3,CO4
	asynchronous,			
В	Ripple count	CO1,CO2,CO3,CO4		
С	ring counter,	BCD counter	er	CO1,CO2,CO3,CO4
Mode of	Theory			
examination				
Weightage	CA	MTE	ETE	
Distribution	30%	20%	50%	
 Text book/s*	1. Mode	rn Digital Ele	ectronics by R. P. Jain, 3rd	
Text book 5	Editic	n McCrow I		
	Euluc	ni, McGlaw F	1111	
Other	1. Digita	l Design and C	omputer Organisation by Dr. N.	
References	S. Gill	and J. B. Dixi	t. University Science Press	
References	2 Digita	l computer ele	ctronics by Malvino & Brown	
	2. Digita Third	Edition TMU	Publications	1
			d Applications has Malaine and	1
	3. Digita	i Principies an	Applications by Maivino and	1
	Leach	, TMH Publica	tions	1
				1

#### CO and PO Mapping

S.	Course Outcome	Program Outcomes (PO) &
No.		Program Specific Outcomes
		(PSO)
1.	<b>CO1:</b> Have a thorough understanding of the fundamental	PEO1,PEO2,PEO3,
	concepts and techniques used in digital electronics.	PEO4,PSO2
2.	<b>CO2:</b> The ability to understand, analyze and design various	PEO1,PEO2,PEO3,PSO1, PSO2
	combinational and sequential circuits.	
3.	<b>CO3:</b> The ability to identify and prevent various hazards and	PEO1,PEO2,PEO3,PSO1,
	timing problems in a digital design	PSO2,PSO3
4.	<b>CO4:</b> To develop skill to build, and troubleshoot digital	PEO1,PEO3,PEO4,PSO1,PSO2,
	circuits.	PSO3

CSE	Cos	PEO1	PEO2	PEO3	PEO4	PSO1	PSO2	PSO3
	CO1	3	3		1		3	
	CO2	3	2	3		1	3	
	CO3	3	2	2		1	3	3
	CO4	3	2		2	2	2	3

Scho	ool: SET	Batch : 2019							
Prog	gram: MCA	Current Academic Year: 2019-20							
Brai	nch:	Semester: I							
1	Course Code	MCA163 Course Name- Fundamental of Information Tec	chnology						
2	Course Title	Fundamental of Information Technology							
3	Credits	3							
4	Contact	3-0-0							
	Hours								
	(L-T-P)								
	Course Status								
5	Course	1. The main objective is to introduce IT in a simple	anguage to all						
	Objective	undergraduate students, regardless of their specialization	1.						
		2. The focus of the subject is on introducing skills rela	ting to IT basics,						
		computer applications, programming, interactive media	as, Internet basics						
		etc.							
6	Course	Students will be able to:							
	Outcomes	<b>CO1:</b> To understand personal computers and their operations.							
		<b>CO2:</b> be able to identify computer hardware components and de	scribe their						
		<b>CO3:</b> Understand basic concents and terminology of information	n technology						
		<b>`O4:</b> Understand basic concepts and working of internet							
7	Course	he course Fundamentals of Information Technology has become essential the							
	Description	present age of computer technology and information, as the appl	ications of						
	read the second se	information technology can be found in all aspects of our lives.							
8	Outline syllabu	IS	CO Mapping						
	Unit 1	Introduction to Computers							
	А	Introduction, Definition, Characteristics of computer, Evolution of Computer	CO1						
	В	Block Diagram Of a computer, Generations of Computer, Classification Of Computers,	CO1, CO2						
	С	Applications of Computer, Capabilities and limitations of computer.	CO1, CO2						
	Unit 2	Basic Computer Organization:							
	А	Role of I/O devices in a computer system. Input Units:	CO1, CO2						
		Keyboard, Terminals and its types. Pointing Devices, Scanners							
		and its types							
	В	Voice Recognition Systems, Vision Input System, Touch	CO1, CO2						
		Screen, Output Units: Monitors and its types. Printers: Impact							
		Printers and its types							
	C	Non Impact Printers and its types, Plotters, types of plotters,	CO1, CO2						
	Imit 2	Sound cards, Speakers.							
		Drimary Ve Secondary Storage Date storage & retrievel	CO1 CO2						
	A	methods. Primary Storage: RAM ROM, PROM, EPROM, EEPROM	01,002						

В	Secondary S Cartridge tap Compact Dis needs, Types	Cartridge tape, hard disks, Floppy disks Optical Disks, Compact Disks, Zip Drive, Flash Drives. Software and its needs, Types of S/W.							
С	System Soft Programming Language, H disadvantages Processing, Sp	CO2							
Unit 4	Information	Technology B	asics						
А	Information T Information S	echnology Bastoria	sics, Introduction, Need for occassing	C01,C02,C03					
В	Information T Technology,	Information Technology Components, Role of Information Technology,							
С	Information T	CO1,CO2,CO3							
Unit 5	Internet								
А	Internet and it Terminology, Transmission	s Tools, Interr Data over Inte	et Evolution, Basic Internet ernet, Modes of Data	CO1,CO2,CO4					
В	Types of Netw the Internet, C Internet Appli IT	Types of Networks, Types of Topologies, Protocols used in the Internet, Getting Connected to Internet Applications, Internet Applications, Computer Ethics, Emerging Trends in							
С	Electronic Co Interchange (I Internet Proto	mmerce (E-Co EDI),Smart Ca col TV	ommerce), Electronic Data rds, Mobile Communication,	C01,C03,C04					
Mode of examination	Theory								
Weightage	CA	MTE	ETE						
Distribution	30%	20%	50%						
Text book/s*	1. Comp	outer Fundame	ntals by P.K.Sinha						
Other References	1.								

#### CO and PO Mapping

S.	Course Outcome	Program Outcomes (PO)
No.		& Program Specific
		Outcomes (PSO)
1.	<b>CO1:</b> Have a basic understanding of personal computers and	PO1,PO2,PO3,PO4,PSO1
	their operations.	
2.	CO2:	PO1, PO3, PO4, PSO2
3.	CO3: Understand basic concepts and terminology of	PO1,PO2,PO3,PO4
	information technology.	
4.	CO4:	PO9, PO10, PO11, PSO5

# **PO and PSO mapping with level of strength for Course Name** Fundamental of Information Technology (**Course Code MCA163**)

CSE	COs	P01	PO2	PO3	P04	PO5	PO6	PO7	PO8	P09	PO10	PO11	P012	PSO1	PSO2	PSO3	PSO4	PSO5
	CO1	3	3	3	3				2	2	1	2	1	3	2	2	1	2
	CO2	3	2	3	3				2	2	2	1	1	2	3	2	1	2
	CO3																	
	CO4																	

		Batch : 2019
Scho	ols: SET	Current Academic Year: 2019-20
		Semester: 1 <sup>st</sup>
1	Course Code	ARP101
2	Course Title	Communicative English-1
3	Credits	2
4	Contact Hours (L-T-P)	1-0-2
5	Course Objective	To minimize the linguistic barriers that emerge in varied socio- linguistic environments through the use of English. Help students to understand different accents and standardise their existing English. Guide the students to hone the basic communication skills - listening, speaking, reading and writing while also uplifting their perception of themselves, giving them self-confidence and building positive attitude.
		<ul> <li>CO1 Learn to use correct sentence structure and punctuation as well as different parts of speech. CO2 Learning new words its application and usage in different contexts helpful in building meaning conversations and written drafts. Develop over all comprehension ability, interpret it and describe it in writing. Very useful in real life situations and scenarios.</li> <li>CO2 A recognition of one's self and abilities through language learning and personality development training leading up to greater employability chances. Learn to express oneself through writing while also developing positive perception of self. To be</li> </ul>
6	Course Outcomes	able to speak confidently in English CO3 To empower them to capitalise on strengths, overcome weaknesses, exploit opportunities, and counter threats. To ingrain the spirit of Positive attitude in students through a full length feature film followed by a storyboarding activity. Create a Self Brand, identity and self esteem through various interesting and engaging classroom activity
		CO4 Exposing students to simulataions and situations wherein students learn to describe people and situations and handle such situations effectively and with ease. Teaching students how to engage in meaningful dialogues and active conversational abilities to navigate through challenging situations in life and make effective conversations. CO12 Learn how to transform adverse beginnings into positive endings – through writing activities like story completion.
7	Course Description	The course is designed to equip students, who are at a very basic level of language comprehension, to communicate and work with ease in varied workplace environment. The course begins with basic grammar structure and pronunciation patterns, leading up to apprehension of oneself through written and verbal expression as a first step towards greater employability.

8		Outline syllabus - ARP 201	
	Unit A	Sentence Structure	CO Mapping
	Topic 1	Subject Verb Agreement	
	Topic 2	Parts of speech	CO1
	Topic 3	Writing well-formed sentences	
	Unit B	Vocabulary Building & Punctuation	
	Topic 1	Homonyms/ homophones, Synonyms/Antonyms	CO1
	Topic 2	Punctuation/ Spellings (Prefixes-suffixes/Unjumbled Words)	CO1, CO1
	Topic 3	Conjunctions/Compound Sentences	CO1, CO2
	Unit C	Writing Skills	
	Topic 1	Picture Description – Student Group Activity	CO3
	Topic 2	film - Paragraph Writing inculcating the positive attitude of a learner through the movie   SWOT Analysis – Know yourself	CO3, CO2, CO3
	Topic 3	Story Completion Exercise –Building positive attitude - The Man from Earth (Watching a Full length Feature Film)	CO2, CO3, CO4
		Speaking Skill	<u> </u>
		Self-introduction/Greeting/Meeting people – Self branding	CO2, CO3
	Topic 2	Describing people and situations - To Sir With Love ( Watching a Full length Feature Film )	03, 04
	Topic 3	Dialogues/conversations (Situation based Role Plays)	CO2, CO4, CO4
9	Evaluations	Class Assignments/Free Speech Exercises / JAM Group Presentations/Problem Solving Scenarios/GD/Simulations ( 60% CA and 40% ETE	N/A
10	Texts & References   Library Links	<ul> <li>Blum, M. Rosen. How to Build Better Vocabulary. London: Bloomsbury Publication</li> <li>Comfort, Jeremy(et.al). Speaking Effectively. Cambridge University Press</li> </ul>	

#### **Observations**:

- 1. A Single Consolidated Syllabus has now replaced the Previous Functional English Beginners -1 and Functional English Intermediate -1
- 2. Credits previously allocated to FEN 01 Lab Sessions have been dissolved
- 3. The Pearson Voice Labs have been completely eliminated

School: SET		Batch : 2019						
Program: MCA		Current Academic Year: 2019-20						
Branch:		Semester: I						
1	Course Code	MTH133 Course Name: Mathematical Foundation of Com	puter Science					
2	Course Title	Mathematical Foundation of Computer Science						
3	Credits	4						
4	Contact Hours (L-T-P)	3-1-0						
	Course Status							
5	Course	Fundamental concepts and tools in discreet mathematics with emphasis on their						
	Objective	applications to computer science						
6	Course Outcomes	Students will be able to: CO1:understanding the role and importance of proof in mathematics, as well as the concept of the importance of assumptions in the proof						
		<b>CO2:</b> knowledge of the concepts and methods of mathematical relation calculus, and concepts concerning functions which fundamentals of various disciplines of mathematics, Stude comprehend mathematical principles and logic	cal logic, set theory, are included in the ent will be able to					
		CO3: Formulate Minimized Finite Automata for regular Languages.						
		<b>CO4:</b> To understand the structure and dynamics of mathemat definitions, theorems, proofs, and to learn the fundamental mathematics, such as proof by contrapositive, proof by contract	ics such as axioms, proof strategies in diction.					
7	Course Description	This course will discuss fundamental concepts and tools in dis with emphasis on their applications to computer science. Exan logic and Boolean circuits; sets, functions, relations, and finite expression.	crete mathematics nple topics include automata, regular					
8	Outline syllabus		CO Mapping					
-	Unit 1	Set Theory						
	A	Combination of sets, Multisets, Ordered pairs, Set Identities. Relations: Definition, Operations on relations, Properties of relations, Composite Relations, Equality of relations, Order of relations.	CO1, CO2					
	В	Functions: Definition, Classification of functions, Operations on functions, Recursively defined functions.	CO1, CO2					
	С	Partial order sets, Combination of partial order sets, Hasse diagram.	CO1, CO2					
	Unit 2	Algebraic structure						
	А	Groups, Properties of groups, semi-group, monoid group.	CO1, CO2,CO4					
	В	Abelian group, sub group, cyclic group, normal sub group, permutation groups and Symmetric groups	CO1, CO2,CO4					
	С	Definition and elementary properties of Rings and Fields, Integers Modulo n.	CO1, CO2,CO4					
	Unit 3	Propositional Logic						
	Α	Propositional Logic: Proposition, well formed formula, Truth tables, Tautology, Satisfiability, Contradiction	CO1,CO2					
	В	Principle of substitution, logical equivalence, arguments- valid and fallacy arguments, rules of inferences, duality law	CO1,CO2					

				7		
С	Connectives-	CO1,CO2				
	Propositional					
Unit 4	<b>Finite Autom</b>	ata				
А	Introduction to	o languages, K	leene closures, Finite Automata	CO3,CO4		
	(FA), Transiti	on graph, Non	deterministic finite Automata			
	(NFA), Deterr	ninistic finite	Automata (DFA).			
В	Equivalence o	CO3,CO4				
С	Optimization	CO3,CO4				
Unit 5	Regular Exp	CO3,CO4				
А	Regular Expre	CO3,CO4				
	Regular Expre					
В	Arden Theore	CO3,CO4				
 С	Applications a	CO3,CO4				
Mode of	Theory					
examination						
Weightage	eightage CA MTE ETE					
Distribution	30%	20%	50%			
Text book/s*	1. Liu and Mo	hapatra, "Elen	nents of Distcrete Mathematics",			
	McGraw Hill					
	2. K.L.P. Misl					
	Computer Sci					
	Computation)					
Other	Internet as the					
References						

#### CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	<b>CO1:</b> understanding the role and importance of proof in mathematics, as well as the concept of the importance of assumptions in the proof	PO1,PO2,PO3,PO4,PSO1
2.	<b>CO2:</b> knowledge of the concepts and methods of mathematical logic, set theory, relation calculus, and concepts concerning functions which are included in the fundamentals of various disciplines of mathematics, Student will be able to comprehend mathematical principles and logic	PO1, PO3, PO4, PSO2
3.	<b>CO3:</b> Formulate Minimized Finite Automata for regular Languages.	PO1,PO2,PO3,PO4
4.	<b>CO4:</b> To understand the structure and dynamics of mathematics such as axioms, definitions, theorems, proofs, and to learn the fundamental proof strategies in mathematics, such as proof by contrapositive, proof by contradiction.	PO9, PO10,PO11, PSO5

COs																	
	P01	P02	PO3	P04	PO5	P06	P07	PO8	P09	P010	P011	P012	PSO1	PSO2	PSO3	PSO4	PSO5
<b>MTH133</b> CO1	3	3	3	3				2	2	1	2	1	3	2	2	1	2
<b>MTH133</b> CO2	3	2	3	3				2	2	2	1	1	2	3	2	1	2
<b>MTH133</b> CO3	3	3	3	3				1	1	1	3	2	3	2	1	1	1
<b>MTH133</b> CO4	2	2	2	2	1			2	3	3	3	1	2	2	2	1	3

#### PO and PSO mapping with level of strength for Course Name Mathematical Foundation of Computer Science (Course Code MTH133)

School: SET		Batch: 2019						
Prog	gram: MCA	Current Academic Year: 2019-20						
Bra	nch: CSE	Semester: I						
1	Course Code	MCP161						
2	Course Title	Introduction to C Programming Lab						
3	Credits	1						
4	Contact Hours	0-0-2						
	(L-T-P)							
	Course Status	Compulsory						
5	Course	1. Learn basic programming constructs –data types, decision						
	Objective	structures, control structures in C						
		2. learning logic aptitude programming in c language						
		3. Developing software in c programming						
6	Course	Students will be able to:						
	Outcomes	CO1: Understand core concept of c Programming						
		CO2: Implement Array and String						
		CO3: Implement Functions						
		CO4: Use Union and Structure						
		CO5: Understand and implement Pointers						
7	Course	se Programming for problem solving gives the Understanding of C j						
	Description	and implement code from flowchart or algorithm	1					
8	Outline syllabus		CO Mapping					
	Unit 1	Introduction to C Programming	CO1					
		Write a c program to swap two numbers						
		Write a c Program to Add Two Integers						
		Write a program to check given year is leap year	CO1					
		Write a c program to find GCD of two numbers						
	Unit 2	Arrays and Strings	CO1, CO2					
		Write a c program to calculate the average using arrays						
		Write a c program to find the largest element of the array						
		Write a c program to add two matrix						
		Write a c program to concatenate two strings						
	Unit 3	Functions	CO1, CO2					
		Write a c program to create a function to count number of	,					
		vowels in a string						
		Write a function to calculate factorial of a number	CO1, CO2					
		Write a recursive function for Fibonacci series						
	Unit 4	Structure and Unions	CO3, CO5					
		Write a c program to store information of a student using						
		structure						
		Write a c program to store information of a student using union	CO3, CO5					
	Unit 5	Pointers &File Handling	<u>CO4</u>					
		Write a c program to swap two values using pointers						

	Write a c progr	CO4		
Mode of examination	Practical			
Weightage	CA	MTE	ETE	
Distribution	60%	0%	40%	
Text book/s*	Kernighan, Br Language			
Other References	1. B.S. G Series - 2. E. Bal Edition			

Course outline						
This course implements array and pointer and Recursive applications. The course talks primarily						
about Array, string,	functions, structure & union and Pointers etc.					
<b>Course Evaluation</b>						
Attendance	None					
Any other	CA judged on the practicals conducted in the lab, weightage may be specified					
References						
Text book	Kernighan, Brian, and Dennis Ritchie. The C Programming Language					
Other References	1. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004.					
	2. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill- 1999					
Softwares	Turbo C					

Γ

# **Semester II**
Sc	hool:SET	Batch : 2019										
Pr	ogram:	Current Acade	mic Year: 2019-20									
Μ	CA											
Bı	anch:	Semester: II										
1	Course	MCA164 Cou	rse Name: Object Oriented Programming	g with Java								
	Code											
2	Course	<b>Object Oriented</b>	Programming with Java									
	Title											
3	Credits	4										
4	Contact	3-1-0	-1-0									
	Hours											
	(L-T-P)											
	Course	PG	PG									
	Status											
5	Course	1. Gain knowled	lge about basic Java language syntax and so	emantics to write Java								
	Objective	methods etc.	e concepts such as variables, conditional a	nd iterative execution								
		2 Understand 4	- fundamentals of chiest enjoyted and encourse	uine in Tous including								
		defining classes,	objects, invoking methods etc and exception	handling mechanisms.								
		<b>3.</b> Understand the	principles of inheritance, packages and inter	rfaces.								
6	Course	Students will be a	Students will be able to:									
	Outcomes	CO1. Identify classes, objects, members of a class and relationships among them needed for a										
		specific problem.										
		CO2. WriteJava	applicationprogramsusingOOPprinciplesand	properDemonstrate the								
		CO3 Write Love	norphism and inneritance	niques using execution								
		handling	programs to implement error nandning teen	inques using exception								
		CO4.How to test	document and prepare a professional lool	king package for each								
		business project u	sing javadoc.	81								
7	Course	Basic Object Ori	ented Programming (OOP) concepts, inc	luding objects, classes,								
	Description	methods, paramet	er passing, information hiding, inheritance	and polymorphism are								
		introduced and the	eir implementations using Java are discussed	l.								
8	Outline sylla	us		CO Mapping								
	Unit I	Introduction to	Object Oriented Paradigm	G01. G02								
	А	Introduction to C	OOP, Characteristics of OOP, Difference	CO1, CO2								
		Java s	and procedural languages, realures of									
	В	Java Source file	structure. Prerequisites for compiling and	CO1. CO2								
1		running Java prog	grams									
1	С	ByteCode, Archi	tecture of JVM, Class Loader Execution	CO1, CO2,CO3								
		Engine, Garbage	collection.									
1	Unit 2	Introduction to	Java									
1	А	Java developmen	t Kit (JDK), Introduction to IDE for java	CO1, CO2,CO4								
		development, Set	ting java environment (steps for path and									
		CLASS PATH se	etting).									
	В	Constants, Varial	oles, Data Types, Operators, Expressions.	CO1, CO2,CO4								

С	Decision Mak argument.	ing Branching,	Loops, command line	CO1, CO2,CO4							
Unit 3	Class & Object	et									
А	Arrays, Type Classes Objec	conversion & c ts	casting, Input from keyboard,	CO1,CO2,CO3							
В	MethodsMeth overloading.	od overloading	, Constructors, Constructors	CO1,CO2,CO3							
С	static keyword class	l,Access Modif	fiers, Strings, the string buffer	CO4							
Unit 4	Inheritance, Implementati	package and on	Interface Inheritance								
A	Multilevel Hi Polymorphism inheritance, A	erarchy, Overr 1, use of this ar bstract class ar	iding methods, ad super, Constructor call in ad method,	CO1,CO2,CO3							
В	Final class, me Concept of mu	ethod and varia	ble, Implementing Interface, nce in Java, Wrapper class	CO1,CO2,CO3							
С	Packages: Use (java.langpack	CO1,CO2,CO3									
Unit 5	Exception and										
А	Input/output: I Stream Classes	CO1,CO2,CO3,CO4									
В	reading and wr Handling, Intro throws, Checke exception	iting in file, Int oduction to try, ed and Uncheck	roduction to Exception catch, Finally , throw and and exceptions, User define	CO1,CO2,CO3							
С	Introduction to and issues, Cr Thread class, method, Thread	D Multithreadin reating thread Thread life c d synchronization	ng: multithreading advantages using Runnable interface and ycle, Thread priorities, sleep on	CO1,CO2,CO3,CO4							
Mode of	Theory										
examination											
Weightage	CA	MTE	ETE								
Distribution	30%	20%	50%								
Text book/s*	1.Schildt H, "T	1.Schildt H, "The Complete Reference JAVA2", TMH									
Other References	<ol> <li>Balagurusa</li> <li>Profession Publication</li> </ol>										

S.	Course Outcome	Program Outcomes (PO)
No.		& Program Specific
		Outcomes (PSO)
1.	CO1. Identify classes, objects, members of a class and relationships	PO1,PO2,PO3,PO4,PSO1
	among them needed for a specific problem.	
2.	CO2: Fundamental features of an object oriented language like	PO1, PO3, PO4, PSO2
	Java: object classes and interfaces, exceptions and libraries	
	of object collections.	
3.	CO3.Write Java programs to implement error handling techniques	PO1,PO2,PO3,PO4
	using exception handling.	
4.	CO4.How to test, document and prepare a professional looking	PO9, PO10, PO11, PSO5
	package for each business project using javadoc.	

### PO and PSO mapping with level of strength for Course Name Object oriented programming with JAVA (Course Code MCA164)

COs	POI	PO2	PO3	PO4	504	90d	PO7	804	60d	PO10	PO11	PO12	PSO1	502	PSO3	PSO4	2024
CO1	3	3	3	3				2	2	1	2	1	3	2	2	1	2
CO2	3	2	3	3				2	2	2	1	1	2	3	2	1	2
CO3	3	3	3	3				1	1	1	3	2	3	2	1	1	1
CO4	2	2	2	2	1			2	3	3	3	1	2	2	2	1	3

Sch	ool: SET	Batch : 2019										
Pro	gram: MCA	Current Academic Year: 2019-20										
Bra	nch:	Semester: II										
1	Course Code	MCA165 Course Name- System Analysis and Design										
2	Course Title	System Analysis and Design										
3	Credits	3										
4	Contact	3-0-0	0-0									
	Hours											
	(L-T-P)											
	Course Status	Compulsory										
5	Course	1. This course provides an introduction to the fundamer	ntals of distributed									
	Objective	computer systems,										
		2. Designing Algorithms used in Distributed system.										
		3. Various issues and challenges used in Distributed Syst	em.									
6	Course	students will be able to:										
	Outcomes	<b>CO1:</b> Apply software testing knowledge and engineering method	ods.									
		<b>CO2:</b> Design and conduct a software test process for a software <b>CO3:</b> Identify the needs of software test sutemation and define	e testing project.									
		test tool to support test automation	cost tool to support test automation, and define and develop a									
		<b>CO4:</b> Have an ability understand and identify various software testing problems										
		and solve these problems by designing and selecting software test models										
		criteria, strategies, and methods.										
7	Course	This course introduces the concepts of System Analysis, algorit	This course introduces the concepts of System Analysis, algorithms, design issues									
	Description	and challenges in Distributed system, dentify the problems, and	choose the									
0	Outling gylloby		CO Monning									
0	Uutime synabu	S Fundamental of System Development	CO Mapping									
		System concent characteristics elements of system types of system										
	A	Modern approach to system analysis and design, system.	$\frac{CO1, CO2}{CO1, CO2}$									
	В	development life cycle, approaches to improve the system	01,002									
		development.										
	С	Tools for system development, role of system analyst.	CO1, CO3									
	Unit 2	System Analysis:										
	А	Determining system requirements, traditional methods, modern	CO1,									
		methods.	CO2,CO4									
	В	Structuring system requirements, process modeling, data flow	CO1,									
		diagram.	CO2,CO4									
	C	Logic modeling-conceptual data modeling, E-R modelling.	CO1,									
			CO2,CO4									
	Unit 3	System Design:										
	Α	The Process and Stages of System Design, Design Methodologies, CO1,										
	D	Development Activities.	CO1 CO2 CO2									
	D	Tupos of Forms Basics of Form Design	CO1, CO2, CO3									
	L	Types of Politis, Dasies of Politi Design.	04									

Unit 4	Documentation	n						
A	Documentation Security, Di Development:	n: Importan saster/ Reco	ce, Types very and	of documentation, Ethics in System	C01,C02,C03			
В	Threats to Sys	stem Security,	Control,		CO1,CO2,CO3			
С		CO1,CO2,CO3						
Unit 5	CASE Tools:							
А	Design Issues Forms, Impor Reports,.	Design Issues and CASE Tools Forms and Reports Design: Forms, Importance of Forms, Reports, Importance of Reports,.						
В	Differences be Designing For Design Specif	C01,C02,C03						
С	Narrative Ove Assessment, 7 External Infor Formatting G	CO1,CO2,CO3						
Mode of examination	Theory							
Weightage	CA	MTE	ETE					
Distribution	30%	20%	50%					
Text book/s*	Elias M. Awad	, System Analys	sis & Design,	Galgotia.				
Other References	<ol> <li>Ramakrish Grawhill</li> <li>Coulouris, Concepts a</li> <li>Tenanuanb</li> <li>Gerald Te Press.</li> </ol>							

S.	Course Outcome	Program Outcomes (PO)
No.		& Program Specific
		Outcomes (PSO)
1.	<b>CO1:</b> Students will identify the core concepts of distributed	PO1,PO2,PO3,PO4,PSO1
	systems.	
2.	<b>CO2:</b> the way in which several machines orchestrate to	PO1, PO3, PO4, PSO2
	correctly solve.	
3.	<b>CO3:</b> Students will examine how existing systems have	PO1,PO2,PO3,PO4
	applied the concepts of distributed systems in designing large	
	system.	
4.	<b>CO4:</b> Can additionally apply these concepts to develop	PO9, PO10, PO11, PSO5
	distributed systems.	

## PO and PSO mapping with level of strength for Course Name System Analysis and Design (Course Code MCA165)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	909	PO10	PO11	P012	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3				2	2	1	2	1	3	2	2	1	2
CO2	3	2	3	3				2	2	2	1	1	2	3	2	1	2
CO3	3	3	3	3				1	1	1	3	2	3	2	1	1	1
CO4	2	2	2	2	1			2	3	3	3	1	2	2	2	1	3

Sch	ool: SET	Batch : 2019							
Prog	gram: MCA	Current Academic Year: 2019-20							
Bra	nch: CS	Semester: II							
1	Course Code	MCA166 Course Name: Computer Organization and Arch	itecture						
2	Course Title	Computer Organization and Architecture							
3	Credits	3							
4	Contact Hours (L-T-P)	3-0-0							
	Course Status	PG							
5	Course	Objective of this course is to study organization of a digital of	computer and design						
5	Objective	techniques for designing various components of a digital com	nputer.						
6	Course Outcomes	Students will be able to: <b>CO1:</b> Evaluate and compare computer designs <b>CO2:</b> Design buses <b>CO3:</b> Design simple arithmetic circuits <b>CO4:</b> Compare various design techniques for control unit							
		<b>COS:</b> Construct and evaluate a memory system using RAM/	ROM chips						
7	Course Description	This course covers basic topics about computer architecture and organization. The course provides the study of the structure, characteristics and operation of modern day computer systems including a basic background on the computers evolution, its design process and its internal characteristics which includes processor components, control unit architecture, memory organization and system organization							
8	Outline syllabus		CO Mapping						
	Unit 1	Introduction to Computer Organization							
	А	History, Computer Organization vs. Computer Architecture, Bus: Types, Buses using multiplexers and tri- state buffers, Bus and memory transfer.	CO1, CO2						
	В	Register transfer language, Micro-operations: Arithmetic shift and logic micro operations	CO1, CO2,CO3						
	С	Adder-Subtractor- Incrementor, Arithmetic unit, Logic unit.	CO1, CO2, CO3						
	Unit 2	Computer Arithmetic							
	А	Representation of numbers in 1's and 2's complement, Addition and subtraction of signed numbers.	CO1, CO2,CO3						
	В	Binary Multiplier, Multiplication: Signed operand multiplication, Booth algorithm	CO1, CO2,CO3						
	C	Floating point representation: addition and subtraction.	CO1, CO2,CO3						
	Unit 3	Control Unit							
	A	Hardwire and micro programmed control unit,	CO1,CO2,CO4						
	В	Micro-programming Instruction Format	CO1,CO2,CO4						
	С	Micro-programming Sequencer, Horizontal and vertical Micro-Programming.	C01,C02,C04						
	Unit 4	Processor Organization							
	А	Instruction cycle and sub cycles (fetch and e x e c u t e etc), interrupt: Types and cycle.	C01,C02,C03						
	В	General register organization, stack organization	CO1,CO2,CO3						
	С	Addressing modes, Instruction types, formats, RISC/CISC	CO1,CO2,CO3						
	Unit 5	Memory and I/O							

А	RAM/ROM	memory, desi	gning memory system using	C01,C03,C05					
В	Cache memo	ory: Memory l	hierarchy, performance	C01,C03,C05					
С	Input Output Programmed	t: Isolated I/O l I/O, Interrup	vs. memory mapped I/O, t driven I/O, DMA	C01,C03,C05					
Mode of examination	Theory	Theory							
Weightage CA M		MTE	ETE						
Distribution	30%	20%	50%						
Text book/s*	1. "Compute Prentice-Hal	er system arch l	itecture", Morris M. Mano,						
Other References	1."Computer Mcgrew Hill 2."Computer performance	<ol> <li>Computer Organization", V. C. Hamacher et al., Mcgrew Hill.</li> <li>Computer Organization and Architecture designing for performance" William Stallings, Pearson.</li> </ol>							

S.	Course Outcome	Program Educational			
No.		Objectives (PEO) & Program			
		Specific Outcomes (PSO)			
1.	CO1: Evaluate and compare computer designs	PEO1,PEO2,PSO1			
2.	CO2:Design buses	PEO3, PEO4, PSO2			
3.	CO3: Design simple arithmetic circuits	PEO2,PEO3,PO4			
4.	CO4: Compare various design techniques for control unit	PEO1,PEO2,PSO3			
5.	CO5: Construct and evaluate a memory system using RAM/ROM chips	PEO1,PEO2,PEO3,PEO4			

## PO and PSO mapping with level of strength for Course Name Computer Organization and Architecture (Course Code MCA166)

CSE	Cos	PEO1	PEO2	PEO3	PEO4	PSO1	PSO2	PSO3
	CO1	3	3	1	1	3	1	-
	CO2	1	2	3	3	-	3	1
	CO3	1	3	3	3	1	1	1
	CO4	3	3	-	2	1	-	3
	CO5	3	3	3	3	1	1	2

		Batch : 2019	]				
	Schools: SBS	Current Academic Year: 2019-20					
		Semester: 2 <sup>nd</sup> (Second)					
1	Course Code	ARP102					
2	Course Title	Communicative English -2					
3	Credits	2					
4	Contact Hours (L-T-P)	1-0-2					
5	Course Objective	To Develop LSRW skills through audio-visual language acquirement, creative writing, advanced speech et al and MTI Reduction with the aid of certain tools like texts, movies, long and short essays.					
6	Course Outcomes	<ul> <li>CO1 Move from primary self-assessment to larger goal and vision statement realisation with the help of feature length films as enablers and multimedia as language facilitators.</li> <li>CO2 To develop a positive attitude through written expression of positive thought process and outlook with the help of writing activities like story completion et al.</li> <li>CO3 Learn advanced writing skills in English like full length essays et al.</li> <li>CO4 Master the science of speech and correct pronunciation through the accent-neutralisation program followed by reading sessions applying the lessons learnt.</li> </ul>					
7	Course Description	The course takes the learnings from the previous semester to an advanced level of language learning and self- comprehension through the introduction of audio-visual aids as language enablers. It also leads learners to an advanced level of writing, reading, listening and speaking abilities, while also reducing the usage of L1 to minimal in order to increase the employability chances.					
8		Outline syllabus - ARP 202					
	Unit A	Acquiring Vision, Goals and Strategies through Audio-visual	CO Manning				
	Topic 1	Pursuit of Happiness / Goal Setting & Value Proposition in life	mapping				
	Topic 7	12 Angry Men / Ethics & Principles					
	Topic 3	The King's Speech / Mission statement in life   strategies & Action Plans in Life	CO1				
	Unit B	Creative Writing					
	Topic 1	Story Reconstruction - Positive Thinking					
	Topic 2	Theme based Story Writing - Positive attitude					
	Topic 3	Learning Diary Learning Log – Self-introspection					
	Unit C	Writing Skills 1					

	Topic 1 Topic 2 Topic 3 Unit D	Precis         Paraphrasing         Essays (Simple essays)         MTI Reduction/Neutral Accent through Classroom Sessions & Practice         Vowel, Consonant, sound correction, speech sounds,	CO3					
	Topic 2	Monothongs, Dipthongs and Tripthongs Vowel Sound drills, Consonant Sound drills, Affricates and Fricative Sounds Speech Sounds   Speech Music   Tone   Volume   Diction   Syntax	CO4					
	I OPIC 3      Intonation   Syllable Stress         Unit E     Gauging MTI Reduction Effectiveness through Free Speech							
	Topic 1 Topic 2 Topic 3	Jam sessions       Extempore       Situation-based Role Play	N/A					
9	Evaluations	Class Assignments/Free Speech Exercises / JAM Group Presentations/Problem Solving Scenarios/GD/Simulations ( 60% CA and 40% ETE	N/A					
10	Texts & References   Library Links	<ul> <li>Wren, P.C.&amp;Martin H. <i>High English Grammar and Composition</i>, S.Chand&amp; Company Ltd, New Delhi.</li> <li>Blum, M. Rosen. <i>How to Build Better Vocabulary</i>. London: Bloomsbury Publication</li> <li>Comfort, Jeremy(et.al). <i>Speaking Effectively</i>. Cambridge University Press. The Luncheon by W.Somerset Maugham - <u>http://mistera.co.nf/files/sm luncheon.pdf</u></li> </ul>						

#### **Observations**:

1. A Single Consolidated Syllabus has now replaced the Previous Functional English Beginners -2 and Functional English Intermediate -2

2. Credits previously allocated to FEN 02 the Lab Sessions have been dissolved

3. The Pearson Voice Labs have been completely eliminated

Scho	ool: SET	Batch: 2019										
Prog	gram: MCA	Current Aca	Current Academic Year: 2019-20									
Bra	nch:	Semester: II										
1	Course Code	MCP164										
2	Course Title	<b>Object</b> Orient	ed Programmir	g with Java Lab								
3	Credits	1	0	0								
4	Contact Hours	0-0-2										
	(L-T-P)											
	Course Status	Compulsory	Compulsory									
5	Course Objective	1. Gain knowl Java programs execution meth 2. Understand including defi handling mech 3. Understand	<ol> <li>Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.</li> <li>Understand the fundamentals of object-oriented programming in Java including defining classes, objects, invoking methods etc and exception handling mechanisms.</li> <li>Understand the principles of inheritance, packages and interfaces</li> </ol>									
6	Course Outcomes	Students will be CO1. Identify cl needed for a spe CO2. Write Java the concepts of p CO3. Write Java handling. CO4. How to tes business project	<ul> <li>Students will be able to:</li> <li>CO1. Identify classes, objects, members of a class and relationships among them needed for a specific problem.</li> <li>CO2. Write Java application programs using OOP principles and proper Demonstrate the concepts of polymorphism and inheritance</li> <li>CO3. Write Java programs to implement error handling techniques using exception handling.</li> <li>CO4. How to test, document and prepare a professional looking package for each business project using iavadoc.</li> </ul>									
7	Course Description	Basic Object classes, metho polymorphism discussed.	Oriented Prog ods, parameter are introduced	amming (OOP) conc passing, information and their implement	epts, including obje hiding, inheritance ttations using Java	cts, and are						
8	Outline syllabus	•			CO Mappi	ing						
	Unit 1	Practical base	d on classes and	objects	C01,C02							
		Sub unit - a, b	and c detailed in	Instructional Plan								
	Unit 2	Practical base	C01,C02									
		Sub unit - a, b	and c detailed in	Instructional Plan								
	Unit 3	Practical base	d on inheritanc	e and package	CO2, CO4	ļ						
		Sub unit - a, b	and c detailed in	Instructional Plan								
	Unit 4	Practical base	d on Polymorpl	ism	CO1, CO2	2						
		Sub unit - a, b	and c detailed in	Instructional Plan	,							
	Unit 5	Practical base	d on Exception	handling	CO1, CO3	3						
		Sub unit - a, b	and c detailed in	Instructional Plan	,							
	Mode of examination	Practical										
	Weightage	CA										
	Distribution	60%										
	Text book/s*	1.Schildt H, "T	The Complete Re	ference JAVA2", TMH								
	Other References	1.Balagurusamy E, "Programming in JAVA", TMH2.ProfessionalJavaProgramming:BrettSpell,WROXPublication										

## **Semester III**

Sch	ool: SET	Batch : 2019								
Pro	gram: MCA	Current Academic Year: 2019-20								
Bra	nch:	Semester: III								
1	Course Code	MCA261 Course Name: Java Programming								
2	Course Title	Java Programming								
3	Credits	3								
4	Contact	3-0-0								
	Hours									
	(L-T-P)									
	Course	UG								
	Status									
5	Course	Objective of this course is to provide the ability to desi	gn console based, GUI							
	Objective	based and web based applications. Students will also be able to understand								
		integrated development environment to create, debug	and run multi-tier and							
	0	enterprise-level applications								
6	Course	Students will be able to: CO1. Develop Swing, based GUI								
	Outcomes	<b>CO2</b> : Develop client/server applications and TCP/IP socket	programming							
		<b>CO3</b> Update and retrieve the data from the databases using	SQL							
		CO4Develop distributed applications using RMI								
		CO5Develop component-based Java software using JavaBeans								
_	~	<b>CO6</b> Develop server side programs in the form of servlets								
7	Course	This <i>course</i> introduces computer <i>programming</i> using the <i>J</i>	AVA							
	Description	programming language with object-oriented programming	g principles. Emphasis							
		manipulating objects classes and using object-oriented to	de such as							
		the <i>class</i> debugger.	his such as							
8	Outline syllabu	18	CO Mapping							
	Unit 1	GUI Programming								
	А	Introduction to AWT: Layout managers, AWT and	CO1, CO2							
		Swing components, Menu, Submenu	,							
	В	Dialog Event handling: Action Events, Mouse Events,	CO1, CO2							
		Keyboard Events, Window Events, Listeners								
	С	The Delegation Model of Event Handling, Adapter	CO1, CO2, CO6							
	TT * 0	Classes Java applet: life cycle, Implementation.								
	Unit 2	Data Base Connectivity								
	А	Introduction to JDBC: JDBC API, java.sql package,	CO1, CO2,CO4							
		JDBC Drivers and Architecture Database connectivity								
		Implementation.								
	В	Creating and Accessing Database: Creating tables,	CO1, CO2,CO4							
	Retrieving values, Inserting, Updating and deleting									
	C	Using Prepared statement, Callable statement	CO1 CO2 CO4							
	C	Transactions, Metadata Handling SOL Exceptions	(01, 02, 04)							
	Unit 3	Network Programming								
	A	Sockets: Introduction. Application. TCP socket and UDP	C01.C02.C03							
		socket Implementation								

В	Client and Se	rver sockets, o	data transmission over socket	CO1,CO2,CO3						
С	Introduction	o RMI, RMI	Architecture, Registry server,	CO4, CO6						
	RMI server a	nd RMI client								
Unit 4	Servlets									
А	Servlet: Over	rview and A	CO1,CO2,CO3							
	Servlets Inter	face, Javax.se								
	package, Imp	lementing and	l Deploying Servlets,							
	Exploring De	veloyment De	escriptor (web.xml) .Handling							
	Client HTTP	Request & Se	erver HTTP Response							
В	Redirecting 1	Requests to (	Other Resources, Initializing	CO1,CO2,CO3						
	Parameters &	ServletConte	ext, Initializing a Servlet,							
	Session Mana	igement, Requ	lest Dispatcher and							
	Redirecting									
С	Session Track	king: Cookies	, Session Tracking with	CO1,CO2,CO3						
	HttpSession,	Deployment a	and Database connectivity with							
 	Servlet.			-						
Unit 5	Introduction	to JSP								
А	Life cycle of	JSP, JSP API	, JSP Application Design,	C01,C02,C03,C06						
	Tomcat Serve	er, Scripting e	lements, scriptlet tag,							
_	expression tag	g, declaration	tag							
В	Implicit Obje	cts, JSP Objec	cts, Directive Elements, Action	CO1,CO2,CO3						
~	Elements	11. 5								
C	Exception Ha	ndling, Error	Pages, Database connectivity	C01,C02,C03,C06						
 M 1 C	with JSP									
Mode of	Theory									
 examination	~ .									
Weightage	CA	MTE	ETE							
Distribution	30%	20%	50%							
Text book/s*	1.Balagurusa	my E, "Progra								
Other	1. Schildt H	, "The Compl	ete Reference JAVA2", TMH							
References	2. Schildt H	, "The Compl	ete Reference J2EE", TMH							
	3. Professio	nal Java Prog	ramming:BrettSpell,WROX							
	Publication	on								

		-		
S.	Course Outcome	Program Outcomes (PO)		
No.		& Program Specific		
		Outcomes (PSO)		
1.	CO1:Develop Swing-based GUI	PO1,PO2,PO3,PO4,PSO1		
2.	CO2:Develop client/server applications and TCP/IP socket	PO1, PO3, PO4, PSO2		
	programming			
3.	CO3:Update and retrieve the data from the databases using	PO1,PO2,PO3,PO4		
	SQL			
4.	CO4: Develop distributed applications using RMI	PO9, PO10, PO11, PSO5		
5.	CO5Develop component-based Java software using	PO1,PO2,PO3,PO4		
	JavaBeans			
6.	<b>CO6</b> Develop server side programs in the form of servlets	PO1, PO3, PO4, PSO2		

## PO and PSO mapping with level of strength for Course Name Java Programming(Course Code MCA261)

	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	909	P01 0	P01 1	P01 2	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
	CO1	3	3	3	3				2	2	1	2	1	3	2	2	1	2
ш	CO2	3	2	3	3				2	2	2	1	1	2	3	2	1	2
CS]	CO3	3	3	3	3				1	1	1	3	2	3	2	1	1	1
	CO4	2	2	2	2	1			2	3	3	3	1	2	2	2	1	3
	CO5	3	3	3	3				2	2	1	2	1	3	2	2	1	2
	CO6	3	2	3	3				2	2	2	1	1	2	3	2	1	2

Sch	ool: SET	Batch :2019									
Pro	gram: MCA	Current Academic Year: 2019-20									
Bra	nch:MCA 262	Semester:3									
1	Course Code	MCA262 Course Name: MCA									
2	Course Title	Introduction to Computer Networks									
3	Credits	3									
4	Contact	3-0-0									
	Hours										
	(L-T-P)										
	Course Status	Compulsory	ompulsory								
5	Course	1. Provide students with an overview of networking									
	Objective	2. Gain insight into the issues, challenges and work at all	2. Gain insight into the issues, challenges and work at all level of reference								
		models	models								
		3. Provide the students with practice on applying network	design								
		4. Enhance students communication and problem solving	skills								
6	Course Students will be able to:										
	Outcomes	CO1:Demonstrate and differentiate working of all layers of the OSI Reference									
		Model and TCP/IP model	1 1 .								
		<b>CO2:</b> Investigate and explore fundamental issues driving netwo	rk design								
		<b>CO3</b> : Have a basic knowledge of the use of cryptography and ne	twork security:								
		<b>CO4:</b> Understand and analyze working of various routing algorithms	thms								
7	Course	To familiarize with the basic taxonomy and terminology of con-	nputer networking								
-	Description	area.									
8	Outline syllabu	S	CO Mapping								
	Unit 1	Introduction									
	А	Introduction to computer networks, applications and uses,	CO1, CO2								
		classification of Networks based on topologies, geographical	, ,								
	D	distribution and communication techniques	CO1 CO2								
	В	Connecting devices (Hub, Repeaters, Switches, Bridges, Routers,	01,002								
		Gateways)									
	С	Transmission Media: wired, wireless, Multiplexing techniques-	CO1, CO2								
	Unit ?	Data Link Laver									
	Onit 2										
	А	Functions, Framing, Error Control-Error correction codes(Hamming	CO1. CO2								
		code),Error Detection codes(Parity Bit, CRC)	001,002								
	В	Flow Control- Stop and Wait Protocol, Sliding window –Goback N	CO1, CO2								
		and Selective repeat(ARQ)									
	С	MAC- Sub-layer Protocols: ALOHA, CSMA, CSMA/CD protocols,	CO1, CO2								
		IEEE Standards 802.3, 802.4,802.5									
	Unit 3	Network Layer									
	A	Design issues, IPV4addressing basics and Header format, CIDR,	CO1,CO2								
	D	Sub-neuting and sub-masking Pouting optimality Principle Pouting protocols Chortost asth	CO1 CO2 CO4								
	Б	Kouting, optimality remeiple Kouting protocols-, Shortest path,	01,002,004								

	flooding, dista	nce vector routin	ng, link state routing							
С	Congestion co	ontrol-Leaky buck	ket, Token Bucket, jitter control	CO1,CO2						
Unit 4	Transport La	iyer								
А	Need of tran connection or	Need of transport layer with its services, Quality of service, connection oriented and connection less Transmission Control Protocol: Segment structure and header format, TCPConnection Management, Flow Control								
В	Transmission format, TCPC									
С	TCP congestie Overview of U	C01,C02								
Unit 5	Application I	Application Layer								
А	Domain Name	CO1,CO2								
В	Network Se Asymmetric c	Network Security services, cryptography, Symmetric versus Asymmetric cryptographic algorithms- DES, and RSA								
С	Application o	f Security in Netv	works: Digital signature	CO1,CO2,CO3						
Mode of examination	Theory	Theory								
Weightage	CA	MTE	ETE							
Distribution	30%	20%	50%							
Text book/s*	1. Tane PHI	1. Tanenbaum, A.S." Computer Networks", 4 <sup>th</sup> Edition, PHI								
Other References	1. Forc Lates 2. W. S Mac	uzan, B, "Co st Edition Stallings, "Data millan Press	ommunication Networks", TMH, a and Computer Communication"							

S.	Course Outcome	Program Outcomes (PO) & Program Specific
No.		Outcomes (PSO)
1.	<b>CO1:</b> Demonstrate and differentiate	PO11,PO12,PSO2,PSO3,PSO4
	working of all layers of the OSI	
	Reference Model and TCP/IP model	
2.	<b>CO2:</b> Investigate and explore fundamental	PO1,PO3,PO4,PO5,PO7,PO10,PO11PO12,PSO4
	issues driving network design	
3.	<b>CO3:</b> Have a basic knowledge of the use	PO1,PO2,PO4,PO6,PO7,PO8,PO10,PSO1,PSO3
	of cryptography and network security;	
4.	CO4:Understand and analyze working of	PO2,PO7,PSO2,PSO3
	various routing algorithms	

# PO and PSO mapping with level of strength for Course Name Introduction to Computer Networks (Course Code MCA262)

Cos	POI	PO2	PO3	P04	PO5	PO6	PO7	PO8	60d	PO10	P011	P012	PSOI	PSO2	PSO3	PSO4	PSO5
CO1	-	-	-	-	-	-	-	-	-	-	1	3	-	2	3	1	-
CO2	3	-	3	3	2	-	3	-	-	3	1	2	-	-	-	1	-
CO3	2	3	-	2	-	2	3	2	-	2	-	-	1	-	3	-	-
CO4	-	2	-	-	-	-	1	-	-	-	-	-	-	1	3	-	-

Scho	ol:	Batch : 2019							
Prog	ram:MCA	Current Academic Year: 2019-20							
Brar	ich:	Semester: 3							
1	Course Code	MCA263 Course Name: MCA							
2	Course Title	Principles of Database Management Systems							
3	Credits	3							
4	Contact Hours	3-0-0							
-	(I -T-P)								
	Course Status								
5	Course	1 Develop the ability to design							
5	Objective	2 Implement and manipulate databases							
	objective	3. Introduce students to build data base management systems							
		4 Apply DBMS concepts to various examples and real life appli	cations						
6	Course	Students will be able to:	cations.						
0	Outcomes	1 Apply the knowledge of databases to F-R modelling							
	Outcomes	2 Apply the knowledge of dutabases to D R modeling.	ase design						
		3 Learn and apply Structured Ouery Language (SOL) for data def	inition and data						
	manipulation								
		4 Design a normalized database and able to perform transaction m	nanagement						
concurrency control and recovery system									
7	Course	This course introduces database design and creation using a DBMS product.							
	Description	Emphasis is on normalization data integrity data modeling and d	creation of						
	Description	simple tables queries reports and forms Upon completion stude	ents should be						
		able to design and implement normalized database structures by cr	reating simple						
		database tables, queries, reports, and forms.	cuting simple						
8	Outline syllabus		CO Mapping						
	Unit 1	Introduction to Databases:							
	A	Concept & Overview of DBMS. Data Models. Database	CO1						
		languages, Database Administrator, Database Users.							
	В	Three Schema architecture of DBMS. Data Models.	CO1.CO2						
		Hierarchical. Network .Data independence and database	,						
		language, DDL, DML, Data Modeling using Entity Relationship							
		Model							
	С	Strong Entity, Weak entity, Specialization and generalization.	CO1.CO2						
		converting ER Model to relational tables.	,						
	Unit 2	Relational Database Language and Interfaces:							
	А	Relational data model concepts .Concept of keys, Mapping	CO3,CO2						
		Constraints	,						
	В	Null Values, Domain Constraints, Referential Integrity	CO3,CO2						
		Constraints	,						
	С	Unary Relational Operations: SELECT and PROJECT	CO3,CO2						
		Relational Algebra Operations from Set Theory, Binary							
		Relational Operations: JOIN and DIVISION, SQL.							
	Unit 3	Normalization in Design of Databases:							
	А	Functional Dependency, Different anomalies in designing a	CO4,CO2						
		Database, Normalization first							
	В	second and third normal forms, Boyce odd normal form, multi-	CO4,CO2						
		valued dependencies	, -						
	~		CO4 CO2						
8	Outline syllabus Unit 1 A B C Unit 2 A B C Unit 3 A B	able to design and implement normalized database structures by cr         database tables, queries, reports, and forms.         Introduction to Databases:         Concept & Overview of DBMS, Data Models, Database         languages, Database Administrator, Database Users.         Three Schema architecture of DBMS, Data Models,         Hierarchical, Network ,Data independence and database         language, DDL, DML, Data Modeling using Entity Relationship         Model         Strong Entity, Weak entity, Specialization and generalization,         converting ER Model to relational tables.         Relational Database Language and Interfaces:         Relational data model concepts ,Concept of keys, Mapping         Constraints         Null Values, Domain Constraints, Referential Integrity         Constraints         Unary Relational Operations: SELECT and PROJECT         Relational Algebra Operations from Set Theory, Binary         Relational Operations: JOIN and DIVISION, SQL.         Normalization in Design of Databases:         Functional Dependency, Different anomalies in designing a         Database, Normalization first         second and third normal forms, Boyce odd normal form, multivalued dependencies	CO Mapping CO Mapping CO1 CO1,CO2 CO1,CO2 CO3,CO2 CO3,CO2 CO3,CO2 CO3,CO2 CO4,CO2 CO4,CO2						

	decomposition	ns								
Unit 4	Transaction M	lanagement an	d Concurrency Control:							
А	Transaction pro	ocessing system, Serializability of	schedule and recoverability, Testing of f schedules	CO4,CO2						
В	conflict & view Locking Techn	v serializable sch iques for concur	nedule.Concurrency Control: rency control	CO4,CO2						
С	time stamping	protocols for con	ncurrency control, multiversion schemes	CO4,CO2						
Unit 5	<b>Recovery Sys</b>	stem								
А	Failure Classi Algorithm	fication ,Recov	very and Atomicity ,Recovery	CO4,CO2						
В	Buffer Manag	gement ,Failure	with Loss of Nonvolatile Storage	CO4,CO2						
С	Early Lock Ro Remote Back	Early Lock Release and Logical Undo Operations, ARIES, Remote Backup Systems.								
Mode of examination	Theory	Theory								
Weightage	CA	MTE	ETE							
Distribution	30%	20%	50%							
Text book/s*	3. Korth McGr	, Silberschatz& aw-Hill, Latest l	&Sudarshan, Data base Concepts, Tata Edition							
Other References	1. Elmasri Education 2. Thoma Practical A Pearson Ec 3. Jeffrey 1 Systems, F 4. Date C Wesley	<ol> <li>Elmasri, Navathe, Fundamentals of Database Systems, Pearson Education Inc.</li> <li>Thomas Connolly, Carolyn Begg, Database Systems: A Practical Approach to design, Implementation and Management, Pearson Education, Third Edition.</li> <li>Jeffrey D. Ullman, Jennifer Windon, A first course in Database Systems, Pearson Education.</li> <li>Date C.J., An Introduction to Database Systems, Addison</li> </ol>								

S. No	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes
1.	<b>CO1:</b> To understand and implement classical algorithms in data mining and data warehousing.	PO1,PO2,PO3,PO10,PSO12,PSO3
2.	<b>CO2:</b> To assess the strengths and weaknesses of the algorithms.	PO1, PO2, PO3, PS5,PO9,PO10,PO11,PO12,PSO1,PSO2,PSO3
3.	<b>CO3:</b> To identify the application area of algorithms, and apply them.	PO1,PO2,PO3,PO5,PO9,PO10,PO11,PO12,PSO1,PSO2,PSO3
4.	<b>CO4:</b> To integrating and interpreting the data sets and improving effectiveness, efficiency and quality for data analysis.	PO1, PO2,PO3, PO4,PO5,PO9,PO10,PO11,PO12,PSO1,PSO2,PSO3,PSO4

### PO and PSO mapping with level of strength for Course Name Principles of data Base Management Systems (Course Code MCA263)

A.	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	P012	PSO1	PSO2	PSO3	PSO4
	CO1	2	1	1	-	-	-	-	-	-	3	-	2	-	-	1	-
MC	CO2	3	3	3		3	-	-	-	2	3	2	1	3	3	3	-
	CO3	3	3	3	-	3	-	-	-	3	1	3	3	2	2	3	
	CO4	3	3	3	2	3	-	-	-	3	1	3	3	3	3	3	2

Sch	ool: SET	Batch : 2019												
Pro	gram: MCA	Current Academic Year: 2019-20												
Bra	nch:	Semester: III												
1	Course Code	MCA264 Course Name MCA												
2	Course Title	Operating System Concept												
3	Credits	3												
4	Contact	3-0-0												
·	Hours(L-T-													
	P)													
	Course	Non Elective												
	Status													
5	Course	1. This course introduces the challenges for designing	the operating systems.											
	Objective	2. Includes different design principles and algorithms												
	objective	3. Evaluation of algorithms proposed.												
		4. Implementation of algorithms and utilities.												
6	Course	Students will be able :												
	Outcomes <b>CO1:</b> To identify the challenges and apply suitable algorithms for them.													
		<b>CO2:</b> To assess the strengths and weaknesses of the algorithms.												
		<b>CO3:</b> To understand and implement algorithms in resource	allocation and											
		<b>CO4:</b> To integrate and interpret offectiveness, officiency of	f algorithms used for											
		resource management of operating systems	argoritims used for											
7	Course	This course introduces the design principles of operating systems.	stems resource											
'	Description	management, identifying challenges and applying respective algorithms												
8	Outline syllabi		CO Manning											
0	Unit 1	Introduction	comapping											
	A	Operating System Concepts and functions, Comparison of	CO1 CO2											
	11	different Operating system	001,002											
	В	Types of Operating Systems (Batch, Multiprogramming ,Multi	CO1, CO2											
		Tasking , Multiprocessing, Distributed and Real Time												
	C	Operating System)	CO1 CO2											
	Unit 2	Process Synchronization	01,02											
		Process Concents (PCB, Process States, Process Operations	CO1 CO2 CO2											
	A	Inter process communication)	01, 02,005											
	В	Critical Section problem & their solutions, Introduction to	CO1. CO2.CO3											
		Semaphores,	,											
	С	Classical Problems of Synchronization (Producer Consumer	CO1,											
		Problem, Readers Writer Problem, Dining philosophers	CO2,CO3,CO4											
	Unit 3	CPU Scheduling												
		Concept Types of schedulers( Short term Long term Middle	CO1 CO2											
		term), Dispatcher, Performance Criteria												
	В	CPU Scheduling Algorithms( FCFS, SJF, Priority, Round	CO1,CO2,CO3,CO4											
		Robin, Multilevel Queue, Multilevel feedback Queue)												
	C	Deadlock concepts & Handling Techniques(Avoidance,	CO1,CO2,CO3,CO4											
	TT	Prevention and Detection & Recovery)												
	Unit 4	wiemory wianagement												

А	Memory Hiera	rchy, Memory	v Management Unit	CO1,CO2,CO3		
В	Paging, Segme	entation		CO1,CO2,CO3		
С	Virtual memor algorithms(FC	y concept, der FS, Optimal, I	nand paging, Page replacement LRU), Associative memory	CO1,CO2,CO3		
Unit 5	Disk and File	Management	,			
А	File Concept ,I Windows Oper	File operations rating System	s, File Directories, Case study of	CO1,CO2,CO3		
В	Disk structure LOOK,C-SCA	, Disk schedul N, C-LOOK)	C01,C02,C03,C04			
С	Case study: UN Handling	NIX, Comman	CO1,CO2,CO3			
Mode of	Theory					
examination			-			
Weightage	CA	MTE	ETE			
Distribution	30%	20%	50%			
Text book/s*	1. Silber	rschatz G, Ope	erating System Concepts, Wiley			
Other	1. W. Sta	alling, "Opera	ting System", Maxwell Macmillan			
References	2. Tanne	nbaum A S,	Operating System Design and			
	3. Milen Hill	<i>mentation</i> , Pre kovic M, <i>Ope</i>	erating System Concepts, McGraw			

S.	Course Outcome	Program Outcomes (PO) &
No.		Program Specific Outcomes
		(PSO)
1.	<b>CO1:</b> To identify the challenges and apply suitable algorithms for	PO1,PO2,PO3,PO4,PSO1
	them.	
2.	CO2: To assess the strengths and weaknesses of the algorithms.	PO1, PO3, PO4, PSO2
3.	CO3: To understand and implement algorithms in resource	PO1,PO2,PO3,PO4
	allocation and utilization.	
4.	CO4: To integrate and interpret effectiveness, efficiency of	PO9, PO10, PO11, PSO5
	algorithms used for resource management of operating systems.	

### PO and PSO mapping with level of strength for Course Name Operating System Concept ( Course Code MCA264 )

CSE	COs	POI	PO2	£O3	PO4	PO5	904	PO7	80d	60d	PO10	P011	P012	PSO1	PSO2	PSO3	PSO4
	C01	3	3	3	3				2	2	1	2	1	3	2	2	1
	CO2	3	2	3	3				2	2	2	1	1	2	3	2	1
	CO3	3	3	3	3				1	1	1	3	2	3	2	1	1
	CO4	2	2	2	2	1			2	3	3	3	1	2	2	2	1

Scho	ool: SET	Batch : 2019	
Prog	gram: MCA	Current Academic Year: 2019-20	
Brai	nch:	Semester:III	
1	Course Code	MCA265	
2	Course Title	Data Structures	
3	Credits	3	
4	Contact	3-0-0	
	Hours		
	(L-T-P)		
	Course Status	Core	
5	Course	1. Learn the basicconcepts of Data Structures and algorithms	<b>.</b>
	Objective	2. Design and Implementation of Linear and Non linear Data	Structures.
		3. Learn the concepts of various searching, Sorting	and Hashing
		A Choose the appropriate data structures and algorithm desi	an method for a
		specified application.	gli illetiloti toi a
6	Course	CO1: Understand the importance of various data structures.	
_	Outcomes	CO2: Evaluate algorithms and data structures in terms of tim	ne and memory
		complexity.	
		CO3: Understand the application of linear data structure(s) to	o solve various
		problems	
		CO4: Understand the application of non linear data structu	ure(s) to solve
		various problems.	1 . 1 . 0
		CO5: Implement and know when to apply standard a	algorithms for
		searching and sorting.	(-) <b>f</b>
		CO6: Identify and define the most appropriate data structure	e(s) for a given
		problem	
7	Course	This course starts with an introduction to data struct	ures with its
/	Description	classification efficiency of different algorithms array and	nointer based
	Description	implementations and Recursive applications. As the course	progresses the
		study of Linear and Non-Linear data structures are studied	in details. The
		course talks primarily about Linked list, stacks, queue,	Free structure.
		Graphs etc. This Course also deals with the concept of sea	rching, sorting
		and hashing methods.	8,8
8	Outline syllabu	IS	CO Mapping
	Unit 1	Introduction	11 0
	А	Data Structure – Definition, Operations, Applications and types.	CO1, CO2
		Abstract Data Types, Asymptotic Notations, Time and space	
		complexity of algorithms.	
	В	Recursion – Definition, Examples- Tower of Hanoi problem,	CO1
		Fibonacci Series	
	C	Array Definition Single and Multidimensional Arrays Address	CO1 CO2
		Calculation application of arrays String Operation Sparse	01,002
		Matrices, Lower and Upper Triangular matrices, and tri-diagonal	
	B C	complexity of algorithms.         Recursion – Definition, Examples- Tower of Hanoi problem, Fibonacci Series         Array Definition, Single and Multidimensional Arrays, Address Coloulation, application, of arrays, String, Operating, Science	CO1 CO1, CO2
		Matrices, Lower and Upper Triangular matrices, and tri-diagonal	

	matrices.									
Unit 2	Linked List									
А	Concept of L	inked List, Re	presentation of linked List in	CO3, CO6						
	memory, Garba	ge Collection, C	Verflow and Underflow,							
В	Singly Linked	Lists – Circu	lar Linked Lists, Operations	CO3, CO6						
	Associated with	different linked	l list,							
С	Doubly Linked	l Lists, Operat	tions Associated with different	CO3, CO6						
	linked list, Poly	nomial represen	tation and addition.							
Unit 3	Stack and Que	ues								
А	Array Represen	ntation and Imp	lementation of stack, Operations	CO3, CO6						
	on Stacks: Pu	sh & Pop, Li	nked Representation of Stack,							
	Applications of	stack: Convers	ion of Infix to Prefix and Postfix							
	Expressions, Ev	aluation of post	fix expression using stack.							
В	Array and linke	d representation	and implementation of queues,	CO3, CO6						
	Operations on (	Queue: Create, A	dd, Delete, Full and Empty.							
С	Circular queue,	Dequeue, and P	riority Queue.	CO3, CO6						
Unit 4	Tree and Grap	bh		<u></u>						
А	Trees: Termin	ologies, Trees	– Binary Trees – Binary Tree	CO4, CO6						
	Traversals – I	Traversals – Binary Tree Representations – Binary Search								
D	Trees	<u>CO1 CO(</u>								
В	Search Tree (B)	CO4, CO6								
С	Representation	CO4, CO6								
C	Traversals– Ap	plication of Gra	oh Traversals– Minimum Cost							
	Spanning Trees	- Shortest Path	Problems.							
Unit 5	Searching, Sor	ting and Hashi	ng							
А	Searching: Line	ear & Binary sea	rch	CO5						
В	Sorting: Bubble	e sort, Insertion	sort, Selection sort, Quick sort,	CO5						
C	Shell sort, Merg	ge sort, Heap So	rt	C05						
C	Hasning: Con	cepts, Hash Ta	ble, Hash Functions, Methods	COS						
	of Resolving (	lashes								
Mode of	Theory									
examination										
Weightage	CA	MTE								
 Distribution	50%	20%								
Text book/s*	1. L1pschutz, ' TMH	Data Structure	s" Schaum's Outline Series,							
Other	1. Aaron M. T	enenbaum, Ye	didyah Langsam and Moshe J.							
References	Augenstein "I	Data Structures	Using C and C++", PHI							
	2. Horowitz an									
	Structures", G									
	3. Jean Paul T									
	Introduction to									
	McGraw Hill		<b>.</b>							
	4. R. Kruse eta	al, "Data Struct	tures and Program Design in							
	C", Pearson E	ducation								

	5. G A V Pai, "Data Structures and Algorithms", TMH
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S.	Course Outcome	Program Outcomes (PO)
No.		& Program Specific
		Outcomes (PSO)
1.	Understand the importance of various data structures.	PO1, PO3, PSO1, PSO3
2.	Evaluate algorithms and data structures in terms of time and memory complexity.	PO2, PO4, PO9, PSO1, PSO2
3.	Understand the application of linear data structure(s) to solve various problems	PO1, PO2, PO3, PO9, PSO2
4.	Understand the application of nonlinear data structure(s) to solve various problems.	PO1, PO2, PO3, PO4, PO9, PSO2
5.	Implement and know when to apply standard algorithms for searching and sorting.	PO2, PO3, PO9, PSO3
6.	Identify and define the most appropriate data structure(s) for a given problem	PO3, PO4, PO5, PO9, PSO3

### PO and PSO mapping with level of strength for Course Name Data Structures (MCA265)

Cour se Code	Course Name	P01	P02	P03	P04	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3	PSO 4
	Principles of Data Structures																
	CO1	2		1										2		1	
	CO2		2		1					2				3	1		
	CO3	3	3	2						3					3		
	CO4	3	3	2	3					3					3		
	CO5		1	2												2	
	CO6			3	3	2										3	

		Batch : 2019		
School: SET		Current Academic Year: 2019-20		
		Semester: 3 <sup>rd</sup>		
1	Course Code	ARP203		
2	Course Title	Logical Skills Building and Soft Skills		
3	Credits	2		
4	Contact	102		
4	(I -T-P)	1-0-2		
5	Course Objective	To enhance holistic development of students and improve their employability skills. To provide a 360 degree exposure to learning elements of Business English readiness program, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To step up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a student will have entered the threshold of his/her 1 <sup>st</sup> phase of employability enhancement and skill building activity exercise.		
6	Course Outcomes	CO1: Know Yourself - A proven Student engagement model to assess individual skill level CO2: To identify a student's TNI/TNA (Training Need Identification and Analysis ) data CO3: To make students self-aware   raise self-esteem & effectiveness CO4: To build positive thinking in students and reinforce positive attitude building CO5: How to build positive emotional competence in students   GOAL Setting and SMART Goals CO6: Enhancing LSRW (Listening Speaking Reading Writing)   Verbal Abilities - 1 CO7: Understanding AMCAT + ELITMUS Study patterns for Quantitative aptitude and Logical		
7	Course Description	This Level 1 blended training approach equips the students for Industry employment readiness and combines elements of soft skills and numerical abilities to achieve this purpose.		
8		Outline syllabus - ARP 203		
	Unit 1	BELLS ( Building Essential Language and Life Skills)	CO Mapping	
	А	Subject Verb Agreement   One word substitution, writing well formed sentences, tense, preposition,	CO1, CO2,	
	В	Idioms, phrases, spotting the errors , root verb error, prefix ${f \&}$ suffix	CO3	
	С	Know Yourself: Techniques of Self Awareness   Self Esteem & Effectiveness   Building Positive Attitude   Building Emotional Competence	CO4, CO5,CO6	
	D	Positive Thinking & Attitude Building   Goal Setting and SMART Goals - Milestone Mapping   Enhancing L S R W G and P (Listening Speaking Reading)   Verbal Abilities - 1	CO5, CO6	
	Unit 2	Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical		
	A Syllogism   Letter Series   Coding, Decoding , Ranking & Their Comparison Level-1		C07	
	В	Number Puzzles	С07	
	C Selection Based On Given Conditions			

	Unit 3	Quantitative Aptitude	
	A Number Systems Level 1   Vedic Maths Level-1		
	В	Percentage ,Ratio & Proportion   Mensuration - Area & Volume  Algebra	С07
	Weightage Distribution	Class Assignment/Free Speech Exercises / JAM - 60%   Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude - 40%	
	Text book/s*	Wiley's Quantitative Aptitude-P Anand   Quantum CAT - Arihant Publications   Quicker Maths- M. Tyra   Power of Positive Action (English, Paperback, Napoleon Hill)   Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness - Nathaniel Brandon   Goal Setting (English, Paperback, Wilson Dobson	

School: SET		Batch: 2019				
Program: MCA		Current Aca	demic Year: 2	2019-20		
Bra	nch:	Semester: II	Ι			
1	Course Code	MCP261				
2	Course Title	Java Program	Java Programming Lab			
3	Credits	1	1			
4	Contact Hours	0-0-2				
	(L-T-P)					
	Course Status	Compulsory				
5	Course	Objective of	this course is	to provide the ability to dea	sign console based,	
	Objective	GUI based and web based applications. Students will also be able to				
		understand in	ntegrated devel	opment environment to cre	eate, debug and run	
		multi-tier and	l enterprise-lev	el applications		
6	Course	Students will	be able to:			
	Outcomes	CO1: Develo	p Swing-based	GUI		
		CO2:Develop	p client/server	applications and TCP/IP so	cket programming	
		CO3Update a	and retrieve the	e data from the databases us	ing SQL	
		CO4Develop	distributed ap	plications using RMI	D	
		CO5Develop	component-ba	ised Java software using Jav	vaBeans	
7	Carrier	CO6 Develop	<u>server side pr</u>	ograms in the form of servi	ets.	
/	Course	This course	introduces	computer programming	using the JAVA	
	Description	programming	g language w	in object-oriented progra	mining principles.	
		Emphasis is placed on event-driven programming methods, including				
		such as the o	creating and manipulating objects, classes, and using object-oriente			
8	Outline syllabus		such as the classicebugger.			
0	Unit 1	, Practical ba	sed on AWT a	nd swings		
		Sub unit - a	b and c detailed	d in Instructional Plan		
	Unit 2	Practical ba	sed on JDBC	connectivity	CO1 CO2 CO5	
		Sub unit - a	b and c detailed	d in Instructional Plan		
	Unit 3	Practical ba	<u>sed on networ</u>	k programming	CO1, CO2, CO3	
		Sub unit - a b and c detailed in Instructional Plan				
	Unit 4	Practical ba	sed on servlet	implementation	CO1, CO2,CO6	
		Sub unit - a,	b and c detaile	d in Instructional Plan		
	Unit 5	Practical ba	sed on JSP im	plementation	CO1,CO5,CO6	
		Sub unit - a,	b and c detaile	d in Instructional Plan	, ,	
	Mode of	Practical				
	examination					
	Weightage	CA	MTE	ETE		
	Distribution	60%	0%	40%		
	Text book/s*	1.Balagurusa	my E, "Progra	mming in JAVA", TMH		
	Other	1. Schildt H, "The Complete Reference JAVA2", TMH				
	References	2. Schildt H, "The Complete Reference J2EE", TMH				
		Professional Java Programming:BrettSpell,WROX			X	
		Publication				

School: SET		Batch: 2019-20	21				
Program: MCA		Current Academic Year: 2019-20					
Bra	nch:	Semester: 3					
1	Course Code	MCP262					
2	Course Title	Introduction to C					
3	Credits	1	1				
4	Contact Hours	0-0-2	0-0-2				
	(L-T-P)						
	Course Status	Compulsory					
5	Course	• To identify the working difference between different topologies					
	Objective	To interp	oret the workin	g principle of various communic	ation protocols		
	5	To descr	tibe the concept	of data transfer between nodes			
6	Course	By the end of this	course you will	be able to:			
	Outcomes	CO1: To interpret	the working prin	ciple of various network topologies	8		
		CO2: To analyze	ALOHA, CSMA	,CSMA/CD for packet communicat	ion between		
		nodes connected to	o common topolo	)gy martaliana in Daddaasina and			
		CO3: Investigate a	sh different flow	control mechanism over an unrelial	application layer.		
7	Course	Familiarize the	student with the	basic taxonomy and terminolog	v of the		
,	Description	computer networ	king area Enc	ansulate basic understanding of r	y of the networking in a		
	Description	way to use and a	nnly	apsulate basic understanding of r	ietworking in a		
8	Outline syllabus	wuj to use una a	pp.j.		CO Mapping		
0	Unit 1	Introduction			compping		
		To implement the	token passing ac	cess in BUS topology in LAN. To	CO1		
		implement the tok	en passing acces	s in RING Topology -LAN.	001		
		Familiarization wi	th Networking C	components and devices: Hubs,			
-		Switches, Routers	etc.				
	Unit 2	Data link layer					
		To create scenar	io and study the	e performance of network with	CO2		
		ALOHA,CSMA , CSMA/CD protocol Network Layer					
	Unit 3						
		IP Addressing :sub netting, Super netting			CO3		
	Unit 4	Transport Laye	er				
		Implementation	of Stop and Wa	it Protocol, sliding	CO4		
		window go back	N protocol				
	Unit 5	Application Lay	ver		~~~		
		Implementation	and study of Si	mple mail transfer protocol and	CO3		
-		file transfer proto	ocol.				
	Mode of	Jury/Practical/Vi	iva				
	examination						
	Weightage	CA M	MTE				
	Distribution 60% 0% 40%						
	Text book/s*	I. Tanenba PHI					
	Other	1. Forouzan, B., "Communication Networks", TMH,					
	References Latest Edition						
		2. W. Stallings, "Data and Computer Communication"					
		Macmill	an Press				

School: SET		Batch:			
Prog	gram: MCA	Current Academic Year:			
Bra	nch:	Semester: 3			
1	Course Code	MCP263			
2	Course Title	Principles of Database Management Systems Lab			
3	Credits	1			
4	Contact Hours	0-0-2			
	(L-T-P)				
	Course Status	Compulsory			
5	Course	To Develop efficient SQL programs to access Orac	le databases		
	Objective	Build database using Data Definition Language Sta	tements		
		Perform operations using Data Manipulation Lang	uage		
		statements like Insert, Update and Delete			
6	Course	By the end of this course you will be able to:			
	Outcomes	CO1: Understandthe concept of SQL commands in DBMS			
		CO2: Create SQL SELECT statements that retrieve any red	quired data		
		CO3: Perform operations using Data Manipulation Language statements like Insert, Update and Delete			
		CO4: Manipulate your data to modify and summaries your results for reporting			
7	Course Description	An introduction to the design and creation of relational da database-level applications and tuning robust business appl sessions reinforce the learning objectives and provide parti- opportunity to gain practical hands-on experience	tabases. Create lications. Lab cipants the		
8	Outline syllabus	opportainty to gain practical hands on experience.	CO Mapping		
0	Unit 1	Practical based Data types	compring		
		Classification SOL, Data types of SOL/Oracle	CO1.CO2		
	Unit 2	Practical based on DDL commands			
		Create table . Alter table and drop table	CO1.CO2		
	Unit 3	DML commands and Aggregate functions	,		
		Introduction about the INSERT, SELECT, UPDATE &	CO2.CO4		
		DELETE command.,sum,avg,count,max,min	,		
	Unit 4	Practical based on Grouping Clauses GROUP BY ORDER BY & GROUP BY HAVING	CO1,CO4		
		Briefly explain Group by, order by , having clauses with examples.			
	Unit 5	Practical based on Sub- queries, JOINS	CO1,CO4		
		Related example of Sub- queries, Joins and related examples			
	Mode of	Jury/Practical/Viva			
	examination	-			

Weightage Distribution	CA 60%	MTE 0%	ETE 40%	
Text book/s*	1. Korth , Si McGraw-H	lberschatz& Sud fill	arshan, Data base Concepts, Tata	
Other References	<ol> <li>Elmasr Pearson</li> <li>Thoma Practic Manag</li> <li>Jeffrey Databa</li> </ol>	i, Navathe, Fund n Education Inc. s Connolly, Caro al Approach to ement, Pearson Ed D. Ullman, Jennif se Systems, Pearso	lamentals of Database Systems, lyn Begg, Database Systems: A o design, Implementation and ucation, Latest Edition. er Windon, A first course in on Education.	

School: SET		Batch: 2019				
<b>Program: MCA</b>		Current Academic Year: 2019-20				
Brai	nch:	Semester: III				
1	Course Code	MCP265				
2	Course Title	Data Structures Lab				
3	Credits	1				
4	Contact Hours	0-0-2				
-	(L-T-P)					
	Course Status	Compulsory				
5	Course	1. Learn the basic concepts of Data Structures and algo	rithms.			
_	Objective					
	5	2. Design and Implementation of Linear and No	on linear Data			
		Structures.				
		3. Learn the concepts of various searching, Sortin	g and Hashing			
		1 change the engineerists date structures and classifier				
		4. Choose the appropriate data structures and argorithm	i design method			
6	Course	CO1: Understand the importance of various data structures				
0	Outcomes	CO2: Evaluate algorithms and data structures in terms of tim	ne and memory			
	Outcomes	complexity.	j			
		CO3: Understand the application of linear data structu	re(s) to solve			
		various problems				
		CO4: Understand the application of non linear data structure(s) to solve				
		various problems.				
		CO5: Implement and know when to apply standard algorithms for				
		searching and sorting.				
		CO6: Identify and define the most appropriate data structure(s) for a				
		given problem				
7	Course	This course starts with an introduction to data struct	tures with its			
	Description	classification, efficiency of different algorithms, array and	pointer based			
		implementations and Recursive applications. As the course	progresses the			
		study of Linear and Non-Linear data structures are studied	in details. The			
		course talks primarily about Linked list, stacks, queue, '	Tree structure,			
		Graphs etc. This Course also deals with the concept of sea	rching, sorting			
	<u> </u>	and hashing methods.				
8	Outline syllabus		CO Mapping			
	Unit 1	Introduction				
		Program to implement Operation on Array such as Traversing,	COI			
	Unit 2	Linked List				
		Drogram to implement different exerction on the fallowing	CO1 CO3			
		linked list Singly Doubly and circular linked list				
	Unit 3	Stack & Ououo				
		Program to Implement Stack operation using Array and Linked	CO1 CO2			
		list				
		Program to convert infix expression to post fix expression	CO1 CO3			
		Program to convert minx expression to post fix expression	CO1, CO3			

	Program on Ev	valuation of Post	fix expression	CO1, CO3	
	Program to implement queue operation using array and linked list				
Program to implement circular queue and deque.				CO1, CO3	
Unit 4	Tree & Grap	ns			
	Program to im	plement binary th	ree and BST.	CO4, CO6	
	Program to im	plement MST an	d shortest path algorithm.	CO4, CO6	
Unit 5	Searching, S	orting & Hash	ing		
	Program on Se	earching, Sorting	and Hashing	CO2, CO5	
Mode of examination	Practical				
Weightage	CA	MTE	ETE		
Distribution	60%	0%	40%		
Text book/s*	1. Lipschutz, TMH	"Data Structure	es" Schaum's Outline Series,		
Other References	<ol> <li>IMH</li> <li>Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein "Data Structures Using C and C++", PHI</li> <li>Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication</li> <li>Jean Paul Trembley and Paul G. Sorenson, "An Introduction to Data Structures with applications", McGraw Hill</li> <li>R. Kruse etal, "Data Structures and Program Design in C", Pearson Education</li> </ol>				

#### **Course outline**

This course starts with an introduction to data structures with its classification, array and pointer based implementations. As the course progresses the study of Linear and Non-Linear data structures are studied. The course talks primarily about Linked list, stacks, queue, Tree structure, Graphs etc. This Course also deals with the concept of searching, sorting and hashing methods..

<b>Course Evaluation</b>	Course Evaluation				
Attendance	None				
Any other	CA judged on the practicals conducted in the lab, weightage may be specified				
References					
Text book	1. Lipschutz, "Data Structures" Schaum's Outline Series, TMH				
Other References 1. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein Structures Using C and C++" PHI					
	<ol> <li>Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication</li> <li>Jean Paul Trembley and Paul G. Sorenson, "An Introduction to Data Structures with applications", McGraw Hill</li> <li>R. Kruse etal, "Data Structures and Program Design in C", Pearson Education</li> </ol>				
	5. G A V Pai, "Data Structures and Algorithms", TMH				
Softwares	Turbo C/C++				

### **Semester IV**

School: SET		Batch : 2019										
Program: MCA		Current Academic Year: 2019-20										
Bra	nch: MCA	Semester: 4										
1	Course Code	MCA266 Course Name MCA										
2	Course Title	Software Engineering Principles										
3	Credits	3										
4	Contact	3-0-0										
	Hours											
	(I - T - P)											
	Course Status	Core										
5	Course Status	1 Provide students with an overview of the Software	development life									
5	Objective	cycle for software development methodologies	development me									
	Objective	2 Provide students with insists on requirement asthesis	na activitias									
		2. Provide students with insights on requirement gatherin	ng activities.									
		3. Provide the students with design methodology practic	es.									
		4. Gain Insights about testing techniques.										
		5. Apply Quality management and reliability	y measurement									
		techniques.										
6	Course	Students will be able to:										
	Outcomes	CO1: Illustrate software characteristics and Implement different soft	tware development									
		CO2: Perform requirement gathering in requirement analysis.										
		CO3: Design UML diagrams/DFD/ER diagrams for development of	a software and									
		apply testing techniques using test cases and test suites.										
_	~	CO4: Conduct all aspects of software quality maintenance process.										
7	Course	The objective of this course is to provide fundamental knowledge of software engineering, and make student aware of best software engineering practices, and										
	Description	contemporary software engineering tools.	ractices, and									
8	Outline syllabu	IS	CO Mapping									
	Unit 1	Introduction to software engineering										
	А	Introduction to software engineering, Importance of software,	CO1									
		Software characteristics, Software applications, Software crisis										
	D	and its causes. Waterfall model Incremental model Prototyping Model Spiral	CO1									
	В	Model.	COI									
	С	Introduction to Agile Process models, Scrum, case studies.	CO1									
	Unit 2	Software requirement Specification										
	A	Fundamentals, Requirement gathering process, Requirements	CO2									
		elicitation, Requirements analysis, Requirements specification,										
	В	Requirements validation, DFD, ER-diagrams, Decision Tables,	CO2									
	C	IEEE standards for SRS with examples.	CO2									
	Unit 3	Software Design										
	А	System Design, Problem Partitioning, Top-Down and Bottom-Up	CO3									
	D	design, Effective modules design. Cabasian and Counting Exactly of the	<u> </u>									
	В	Object- Oriented approach	03									
	С	Introduction to UML, UML diagrams, Coding standards and	CO3									
		guidelines.										
	Unit 4	Software Testing										
А	Fundamental Bug, Fault and	of testing, Son Failure,	ne Terminologies: Error, Mistake,	CO3								
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В	Testing: -Leve	ls of Testing, and the box testing.	nd Structures testing - Black Box,	CO3								
С	Software testin System Testing of debugging.	g strategies: In g, Validation ar	tegration Testing, Unit Testing, Id Verification, test cases, overview	CO3								
Unit 5	Software Qua	Software Quality Assurance										
А	Quality conce Software Qual	CO4										
В	Software Relia Software Safet COCOMO-II,	CO4										
С	Framework and Software Quali Engineering.	Framework and models like ISO 9000, CMM, and Statistical Software Quality Assurance: Six Sigma For Software Engineering.										
Mode of examination	Theory											
Weightage	CA	MTE	ETE									
Distribution	30%	20%	50%									
Text book/s*	1. Pressi Appro	man R S, " <i>Sof</i> bach", McGraw	tware Engineering: A Practitioners Hill.									
Other References	1.Somn (Lates2.Jalote Naros3.SADS Prof.4.Schau	<ol> <li>Approach", McGraw Hill.</li> <li>Sommerville, Ian. "Software Engineering", Pearson (Latest Ed).</li> <li>Jalote, Pankaj, "Software Engineering"New Delhi: Narosa (Latest Ed.)</li> <li>SADSE (System Analysis Design) - Prof. Khalkar and Prof. Parthasarathy.</li> <li>Schaum's Series, "Software Engineering" TMH</li> </ol>										
	A B C Unit 5 A B C C Mode of examination Weightage Distribution Text book/s* Other References	A       Fundamental of Bug, Fault and Bug, Fault and         B       Testing: -Level testing and whit         C       Software testing of debugging.         Unit 5       Software Quality software Quality conce Software Quality         A       Quality conce Software Quality         B       Software Relia Software Safet COCOMO-II,         C       Framework and Software Quality Engineering.         Mode of examination       Theory         Weightage Distribution       CA         Other References       1. Pressi Approx         Other References       1. Somm (Lates 2. Jalote Naros         3. SADS Prof. I         Yang       A. Schau	AFundamental of testing, Son Bug, Fault and Failure,BTesting: -Levels of Testing, and testing and white box testing, and white box testing, and white box testing, and white box testing, and testing and white box testing, and testing and white box testing, and testing and white box testing, and testing and white box testing, Validation are of debugging.Unit 5Software Quality Assurance, BBSoftware Reliability: Measure Software Quality Assurance, BBSoftware Reliability: Measure Software Quality Assurance, Software Quality Assurance, E Engineering.Mode of examinationFramework and models like IS Software Quality Assurance, Software Quality Assurance, Software, Software Quality Assurance, Software, So	A       Fundamental of testing, Some Terminologies: Error, Mistake, Bug, Fault and Failure,         B       Testing: -Levels of Testing, and Structures testing - Black Box, testing and white box testing,         C       Software testing strategies: Integration Testing, Unit Testing, System Testing, Validation and Verification, test cases, overview of debugging.         Unit 5       Software Quality Assurance         A       Quality concepts: Quality, Quality Control, Cost of Quality, Software Quality Assurance,         B       Software Reliability: Measures of Reliability and Availability, Software Safety, Software Quality Assurance Plan, COCOMO, COCOMO-II,         C       Framework and models like ISO 9000, CMM, and Statistical Software Quality Assurance: Six Sigma For Software Engineering.         Mode of examination       CA       MTE       ETE         Weightage       CA       MTE       ETE         Distribution       30%       20%       50%         Text book/s*       1. Pressman R S, "Software Engineering: A Practitioners Approach", McGraw Hill.         Other References       1. Sommerville, Ian. "Software Engineering", Pearson (Latest Ed).       2. Jalote, Pankaj, "Software Engineering" New Delhi: Narosa (Latest Ed.)         3.       SADSE (System Analysis Design) - Prof. Khalkar and Prof. Parthasarathy.       4. Schaum's Series, "Software Engineering" TMH								

S.	Course Outcome	Program Outcomes (PO)
No.		& Program Specific
		Outcomes (PSO)
1.	CO1: Illustrate software characteristics and Implement different	PO1,PO2,PO7,PO9,PO10,
	software development methodologies.	,PSO1
2.	CO2: Perform requirement gathering in requirement analysis.	PO2, PO3, PO4, PO5, PSO2
3.	CO3: Design UML diagrams/DFD/ER diagrams for development of	PO1,PO2,PO3,PO4, PO6,
	a software and apply testing techniques using test cases and test suites.	PO9, PO11, PO12
4.	CO4: Conduct all aspects of software quality maintenance process.	PO6,PO11, PSO5

Cos	10d	204	PO3	PO4	705	90d	PO7	PO8	60d	PO10	PO11	PO12	10S4	2024	PSO3	PSO4	2024
CO1	3	3	1	1			3	-	2	2	-	-	3	-	-	-	-
CO2	1	2	3	3	3			1	1	1	-	-	1	2	-	-	-
CO3	3	3	3	3		2		1	2	1	3	2	-	-	-	-	-
CO4	1	1	1	1	-	3		1	1	-	3	1	1	1	1	1	3

# **PO and PSO mapping with level of strength for Course Name** Software Engineering Principles(**Course Code MCA266**)

Sch	ool: SET	Batch : 2019												
Pro	gram:MCA	Current Academic Year: 2019-20												
Bra	nch:	Semester: 4												
1	Course Code	MCA267 Course Name MCA												
2	Course Title	Design and Analysis of Algorithms												
3	Credits	4												
4	Contact	3-1-0												
	Hours													
	(L-T-P)													
	Course	JG												
	Status													
5	Course	Dbjective of this course is to												
	Objective	bjective 1. Reinforce basic design concepts (e.g., pseudocode, specifications,												
down design)														
		2. Knowledge of algorithm design strategies	with man											
		5. Familiarity with an assortment of important algo	nullis.											
6	Course	Students will be able to:	exity											
0	Outcomes	<b>CO1:</b> Analyze the asymptotic performance of algorithms												
	Outcomes	<b>CO2</b> :Write rigorous correctness proofs for algorithms.												
		CO3: Demonstrate a familiarity with major algorithms and	nd data structures											
		CO4: Apply important algorithmic design paradigms and	methods of analysis											
7	Course	This course introduces concepts related to the design and	analysis of algorithms.											
	Description	Specifically, it discusses recurrence relations, and illustra	ites their role in											
		strategies divide and conquer techniques, dynamic progra	amming and max flow -											
		min cut theory for designing algorithms, and illustrates the	tem using a number of											
		well-known problems and applications.												
8	Outline syllabu	15	CO Mapping											
	Unit 1	Introduction												
	А	Notion of an Algorithm – Fundamentals of Algorithmic	CO2, CO3											
		Problem Solving – Important Problem Types –												
		Fundamentals of the Analysis of Algorithm Efficiency												
	D	- Analysis Framework	<u></u>											
	В	Asymptotic Notations and their properties –	C01, C02, C03											
		algorithms. Recurrences relations												
	С	Divide-and-conquer: Analysis and Structure of divide-	CO1, CO2, CO4											
	-	and-conquer algorithms, Divide-and-conquer	,,											
		examples- Binary search, Quick sort, Merge sort,												
		Medians and Order Statics												
	Unit 2	Dynamic Programming												
	А	Overview, Difference between dynamic programming	CO1, CO2, CO3,											
		and divide and conquer	CO4											
	В	Applications and analysis: Matrix Chain	CO1, CO2, CO4											
		Multiplication, 0/1 Knapsack Problemrecords												
		Applications and analysis: Longest Common sub-	CO1, CO2, CO3,											

	sequence, Al	l pairs shorte	st paths	CO4		
Unit 3	Greedy Met	hod				
A	Overview of example of ex Spanning Tre	the Greedy particular the Greedy particular the Arim's ar	aradigm, Analysis and tion solution, Minimum nd Kruskal's Algorithm	CO1,CO2,CO4		
В	Fractional Kr paths, task sc	napsack probl heduling	em, Single source shortest	CO1,CO2,CO3, CO4		
С	Overview and Bound: N-Qu	d analysis of a lieens problem	CO1, CO2, CO3, CO4			
Unit 4	Advanced D	ata Structur	es			
А	Red-Black Tr and deletion	rees - Definit	CO1,CO2,CO3			
В	B-Trees - De Deletion in B	finitions, App -Trees	plications, Insertion and	C01,C02,C03		
С	Data Structur Operations, A	e for Disjoin Applications i	CO1,CO2,CO3			
Unit 5	Selected Top	oics				
А	Introduction Examples, Au	to NP Compl mortized Ana	ete and NP Hard Problems, lysis	C01,C02,C03,		
В	Approximation Problem and Algorithms.	on Algorithm Vertex Cover	s – Travelling Sales Person r Problem, Randomized	CO1,CO2,CO3,		
С	String Match Algorithm, R	ing Algorithr abin Karp Al	ns – Naive String Matching gorithm.	C01,C02,C03		
Mode of examination	Theory					
Weightage	CA	MTE	ETE			
Distribution	30%	20%	50%			
Text book/s*	2. Corm Algor	en et al., rithms", Prenti				
Other References	<ol> <li>Sahni et a Galgotia F</li> <li>Hopcroft A Algorithm</li> </ol>	al., "Fundamer Publications. A, The Design as, Addison Wo				

S.	Course Outcome	Program Outcomes (PO)
No.		& Program Specific
		Outcomes (PSO)
1.	<b>CO1:</b> Analyze the asymptotic performance of algorithms	PO1,PO2,PO3,PO4,PSO1
2.	CO2: Write rigorous correctness proofs for algorithms	PO1, PO3, PO4, PSO2
3.	CO3: Demonstrate a familiarity with major algorithms and	PO1,PO2,PO3,PO4
	data structures	
4.	CO4: Apply important algorithmic design paradigms and	PO9, PO10, PO11, PSO5
	methods of analysis	

Cos	POI	P02	PO3	P04	P05	P06	LOA	PO8	909	PO10	P011	P012	PS01	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3			-	2	2	1	2	1	3	2	2	1	2
CO2	3	2	3	3				2	2	2	1	1	2	3	2	1	2
CO3	3	3	3	3				1	1	1	3	2	3	2	1	1	1
CO4	2	2	2	2	1			2	3	3	3	1	2	2	2	1	3

### PO and PSO mapping with level of strength for Course Name Design and Analysis Algorithm (Course Code MCA267)

Sch	ool: SET	Batch: 2019									
Pro	gram: MCA	Current Acad	demic Year: 2	019-20							
Bra	nch:	Semester: 4									
1	Course Code	MCP 267									
2	Course Title	Design and A	nalysis of Algo	rithms Lab							
3	Credits	1	5 0								
4	Contact Hours	0-0-2									
	(L-T-P)										
	Course Status	Compulsory									
5	Course	Objective of thi	is course is to								
	Objective	Reinfor	rce basic design	concepts (e.g., pseudocod	e, specifications, top-						
		down d	lesign)								
		Knowle	edge of algorithr	n design strategies							
		• Familia	arity with an asso	ortment of important algor	ithms.						
	~	Enable	students to analy	yze time and space comple	exity						
6	Course	Students will be	e able to:								
	Outcomes	COI: Analyze	the asymptotic p	erformance of algorithms							
		CO2: write rig	trate a familiarity	with major algorithms ar	nd data structures						
		<b>CO4:</b> Apply in	portant algorith	mic design paradigms and	methods of analysis						
7	Course	This course int	roduces concept	s related to the design an	d analysis of algorithms.						
	Description	Specifically, it	t discusses rec	urrence relations, and	illustrates their role in						
	1	asymptotic and	l probabilistic a	nalysis of algorithms. It	covers in detail greedy						
		strategies divid	le and conquer t	echniques, dynamic progr	camming and max flow -						
		min cut theory	for designing a	lgorithms, and illustrates	them using a number of						
0		well-known pro	oblems and appli	cations.							
8	Outline syllabus				CO Mapping						
	Unit I	Practical base	ed on algorith	m design by brute	C01, C02, C04						
		Sub unit a b	ide and conqu	er paradigm							
	Unit 2	Sub unit - a, b	and c detailed	in Instructional Plan							
	Unit 2	Practical rela	ited to dynami	c programming	C01, C02, C03, C04						
		Sub unit a b	and a datailad	in Instructional Plan							
	Unit 3	<b>Dreaticel rele</b>	tod to groody	mathad	CO2 CO3 CO4						
		Sub unit a b	and c detailed	in Instructional Plan	02,003,004						
	Unit A	<b>Practical rela</b>	ted to advance	ad data structures	CO2 CO3 CO4						
		Sub unit - 2 b	and c detailed	in Instructional Plan	02,003,004						
	Unit 5	Practical rela	ted to string n	natching algorithms	CO1 CO2 CO3 CO4						
		Sub unit - a. b	and c detailed	in Instructional Plan							
	Mode of	Iury/Practical/Viva									
	examination										
<u> </u>	Weightage	CA	MTE	ETE							
	Distribution	60%	0%	40%							
	Text book/s*	-	- / <b>-</b>								
	Other										
	References										
L	1010101005										

Sch	ool: SET	Batch : 2019				
Prog	gram: MCA	Current Academic Year: 2019-20				
Bra	nch:	Semester: 4				
1	Course Code	MCA270 Course Name				
2	Course Title	Computer Graphics and Animation				
3	Credits	4				
4	Contact Hours	3-1-0				
	(L-T-P)					
	Course Status					
5	Course	This course is designed to provide a comprehensive	e introduction to			
	Objective	computer graphics leading to the ability to understand	nd contemporary			
		terminology, progress, issues, and trends. A thorough	n introduction to			
		computer graphics techniques, focusing on 3D modeling,	image synthesis,			
		and rendering.				
6	Course	Students will be able to:				
	Outcomes	<b>CO1:</b> Understand the technology requirement for graphic	s system.			
		<b>CO2:</b> Construct various object to create various application	on.			
		<b>CO3:</b> Formulate proficiency in 2D and 3D computer grap	ohics API			
		programming.				
		<b>CO4:</b> Apply in-depth knowledge of display systems, imagination	ge synthesis,			
		shape modeling, and interactive control of 3D computer g	graphics			
7	0	applications.	· · 1 C			
/	Course	Computer Graphics 1 is a study of the hardware and softw	are principles of			
	Description	interactive faster graphics. Topics include an introduction	to the basic			
		transformations, projections, rendering techniques, graphi	willg ical software			
		nackages and graphics systems				
8	Outline syllabu	s	CO Manning			
0	Unit 1	Granhic System Primitives	comupping			
	A	Display devices Input and Output Devices Output	CO1 CO2			
	7 <b>x</b>	Primitives: Points and Lines. Pixels. Pixel addressing	001,002			
		and Object Geometry, Planes, Frame buffers, vector and				
		character generation				
	В	Line-Drawing Algorithms-DDA and Brenham's	CO1, CO2,CO3			
		algorithms. Circle-Generating algorithms				
	С	Scan-Line, Polygon Fill algorithms, Boundary Fill and	CO1, CO2,CO3			
		Flood-Fill Algorithms				
	Unit 2	Transformations				
	А	Basic Transformations, Composite Transformations	CO1, CO2,CO3			
	В	General Fixed-Point Scaling, Other Translations-	CO1, CO2,CO3			
		Reflection, Shear				
	С	Transformations between Coordinate Systems, Raster	CO1, CO2,CO3			
		Methods for Transformations				
	Unit 3	Windowing and Clipping And 3D Transformation				
	А	Window, Viewport, Window-To-Viewport Coordinate	CO2,CO3,CO4			

		transformatio	on, zooming a	and panning, Clipping								
		Operations, I	Point Clipping	g, Line Clipping-Cohen-								
		Clipping Alg	ane Chpping,	Conen-Sumeriand Line								
		Clipping Alg	orithm Cyru	a Rock clipping								
	D	2 D transform	notion. Trong	S beck clipping	CO2CO2CO4							
	D	Shearing, Re	flecting	station, Rotation, Scaling,	02,003,004							
	С	Composite T	ransformation	ns, Rotation about an arbitrary	CO2,CO3,CO4							
		line, Reflecti										
	Unit 4	Parallel Pro	jections & H	lidden surface Removal								
	А	Orthographic Projections	Orthographic Projections, Oblique Projections, Parallel Projections									
	В	Perspective I vanishing po	Projections, C	One Point, Two, Three Point	CO2,CO3,CO4							
	С	Back Face Sorting Meth	Back Face Detection, Depth Buffer Method, Depth Sorting Method (Painter's algorithm)									
	Unit 5	Spline Curv	ves, Surface	s and Animation								
	А	Parametric C	ontinuity, Cu	bic Spline Interpolation,	CO2,CO3,CO4							
		Natural cubic	c splines, Her	mite Interpolation Cubic								
		Spline approx	ximations	-								
	В	Bezier Curve	es and Surface	es, B-Spline, Uniform	CO2,CO3,CO4							
		periodic curv	ve, cubic perio	odic curve								
	С	Introduction	to Animation	, Principles of Animation,	CO2,CO3,CO4							
		Types of Ani	imation.									
	Mode of	Theory										
	examination		1	1								
	Weightage	CA	MTE	ETE								
	Distribution	30%	20%	50%								
	Text book/s*	1. J. Foley,	V. Dam, S. I	Feiner, J. Hughes, "Computer								
		Graphics Prin	nciples and P	Practice", 2nd Edition, Pearson								
		Education, L	atest Edition.									
	Other	1. D. Roger	s, J. Adams,	"Mathematical Elements for								
	References	Computer G										
		Publication,										
		2. Hearn, M.										
		2nd Edition,	Pearson Educ	cation, 2002.								
		5. D. Koge	rs, Procedu	Iral Elements for Computer								
		Graphics", 2	na Eaition, T	ala McGraw-Hill Publication,								
1		Latest Editio	11.		1							

S.	Course Outcome	Program Outcomes (PO) &
No.		Program Specific Outcomes
		(PSO)
1.	<b>CO1:</b> Understand the technology requirement for	PO1,PO2,PO3,PO4,PSO1
	graphics system.	
2.	<b>CO2:</b> Construct various object to create various	PO1, ,PO3, PO4, PSO2
	application.	
3.	<b>CO3:</b> Formulate proficiency in 2D and 3D computer	PO1,PO2,PO3,PO4,PO11,PS11
	graphics API programming.	
4.	CO4: Apply in-depth knowledge of display systems,	PO10,PO11, PSO5
	image synthesis, shape modeling, and interactive	
	control of 3D computer graphics applications.	

# PO and PSO mapping with level of strength for Course Name Computer Graphics and Animation(Course Code MCA270 )

COs	POI	PO2	PO3	P04	PO5	P06	PO7	PO8	909	PO10	P011	P012	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3				2	2	1	2	1	3	2	2	1	2
CO2	3	2	3	3				2	2	2	1	1	2	3	2	1	2
CO3	3	3	3	3				1	1	1	3	2	3	2	1	1	1
CO4	2	2	2	2	1			2	3	3	3	1	2	2	2	1	3

Scho	ool:	Batch: 2019							
Prog	gram:	Current Academic Year: 2019-20							
Bra	nch:	Semester:IV							
1	Course Code	MCP270							
2	Course Title	Computer Graphics and Animation Lab							
3	Credits	1							
4	Contact Hours	0-0-2							
	(L-T-P)								
	Course Status	Compulsory/Elective							
5	Course	• This course is designed to provide a comprehensive	ve introduction						
	Objective	to computer graphics leading to the ability	to understand						
		contemporary terminology, progress, issues, and							
		thorough introduction to computer graphics technique							
		on 3D modeling, image synthesis, and rendering.							
6	Course	Students will be able to:							
	Outcomes	<b>CO1:</b> Understand the technology requirement for graphics	system.						
		<b>CO2:</b> Construct various object to create various application.							
		<b>CO3:</b> Formulate proficiency in 2D and 3D computer graphics API							
		programming.							
		CO4: Apply in-depth knowledge of display systems, image synthes							
		shape modeling, and interactive control of 3D computer gra							
7	Course	Computer Graphics Lis a study of the hardware and software	re principles						
/	Description	of interactive raster graphics. Topics include an introductic	on to the basic						
	Description	concepts 2-D and 3-D modeling and transformations view	ving						
		transformations, projections, rendering techniques, graphic	al software						
		packages and graphics systems.	ur sort wire						
8	Outline syllabus		CO Mapping						
	Unit 1	Graphics Systems Premitives							
	А	Drawing of line & basic shapes using-in-built functions							
	В	Implementation of object drawing algorithm (Line,circle,etc).							
	С	Implementation of color filling algorithms.							
	Unit 2	2D Transformation							
	А	Implementation of 2D transformation methods,							
	В	Implementation of composite transformation methods.							
	С	Implementation of composite transformation about							
		certain points.							
	Unit 3	3D Transformation							
	А	Implementation of 3D transformation methods,							
	B	Implementation of composite transformation methods.							
	С	Implementation of clipping algorithms							
	Unit 4	Projections and Hidden Surface Removal							
	Α	Implementation of various projection methods.							
	В	Implementation of hidden surface removal algorithms.							

С	Implemen							
Unit 5								
	Animatio							
А	Uses of in	Uses of inbuilt functions for animation.						
В	One menu							
Mode of	Practical/	Viva						
examination								
Weightage	CA	MTE	ETE					
Distribution	60%	0%	40%					
Text book/s*	-	-						
Other								
References								

Sch	ool: SET	Batch :2019							
Pros	gram: MCA	Current Academic Year: 2019-20							
Bra	nch:	Semester: 4							
1	Course Code	MCA268 Course Name							
2	Course Title	Advanced Database Management Systems							
3	Credits	3							
4	Contact	3-0-0							
	Hours								
	(L-T-P)								
	Course Status	DE 1							
5	Course	The objective of this course is to:							
	Objective								
		1. Exhibit memory of previouslylearnedmaterial							
		byrecalling facts, terms, basic concepts.							
		2. To Understand the different architecture of dat	abases.						
		3. To Learn & Solve the new database structure problem	ems						
		4 Handling different user views of the sa	me stored data						
		combining interrelated data setting stand	ards, controlling						
		concurrent updates so as to maintain data integ	rity.						
6	Course	Students will be able to:							
	Outcomes	1. To Unterstand the overview of Database							
		2. To learn the types of system architectu	ares commercial						
		relational database system							
		3. Understand the various concepts about the dist	ributed databases						
		and its architectures.							
		4. Understand the basic concepts of Concurrecy	control, 11mes &						
		5 Understand and analyze the database stores	a structures and						
		5. Understand and analyze the database storag	se structures allu						
		auery evaluation techniques and and query ont	imization						
		query evaluation teeninques and and query opt	innzation.						
7	Course	This course introduces advanced aspects of data							
	Description								
8	Outline syllabu	S	CO Mapping						
	Unit 1	INTRODUCTION TO DATABASES AND ER DIAGRAM							
	А	Concept & Overview of DBMS, Data Models,	CO1						
	В	Three Schema architecture of DBMS Data Models, Schema – Star and Snowflake	CO1						
	С	DDL and DML commands, Domain Constraints, Referential Integrity Constraints, Views,	CO1						
	Unit 2	SYSTEM ARCHITECTURE							
	Α	Database-System Architectures, Centralized and Client -Server	CO1, CO2						

<b></b>		A 1	a a	1 to						
		Architectures,	Server System A	Architectures,						
	В	Parallel Databa ,Intraquery Para	ses, Introduction allelism,,	n,Parallelism , Interquery Parallelism	CO1, CO2					
	С	Intraoperation I Optimization D	Parallelism, Inter resign of Parallel	roperation Parallelism, Query Systems	CO1, CO2					
	Unit 3	DISTRIBUTE ARCHITECT	DISTRIBUTED DATABASE CONCEPTS & ARCHITECTURES							
	А	Distributed Dat database. Distri	abase Concepts buted Data stora	Homogenous Heterogenous	C01,C03					
	В	Transaction & c Management in Replication, and Design	query processing Distributed Dat d Allocation Tec	, Overview of Transaction abases, Data Fragmentation, chniques for Distributed Database	CO1,CO3					
	С	Overview of Co Databases, Que Databases Typ Database Archi	CO1,CO3							
	Unit 4	CONCURRE	NCY CONTR	ROL						
	А	Lock-Based P Granularity, T Protocols,	Lock-Based Protocols ,Deadlock Handling, Multiple Granularity ,Timestamp-Based Protocols ,Validation-Based Protocols							
	В	Multiversion S Delete Operat	Schemes ,Snap ions, and Predi	shot Isolation, Insert Operations, cate Reads	CO1,CO4					
	С	Insert Operation Weak Levels	ons, Delete Op of Consistency	erations, and Predicate Reads, in Practice	CO1,CO4					
	Unit 5	DATABASES	AND PERFOR	MANCE TUNING						
	А	Temporary Tab	les, Indexing an	d Hashing ( <b>SQL</b> )–	CO5					
	В	Query Process	ing, Query Optir	nization, Data Fragmentation	CO5					
	С	(Horizontal Vs	Vertical), Pivot,	Delta Queries.	CO5					
	Mode of	Theory								
	examination	2								
	Weightage	CA	MTE	ETE						
	Distribution	30%	20%	50%						
	Text book/s*	1. Korth Tata M 2. Elmas Pearso								
	Other References	1. Thoma Practic Manag								
		<ol> <li>Jeffrey Databa</li> <li>Date C Wesley</li> <li>Richar organi</li> </ol>	7 D. Ullman, Jen ase Systems, Pea C.J., An Introduc y. d T. Watson, Da zation, Wiley.	nifer Windon, A first course in arson Education. tion to Database Systems, Addison ata Management: databases and						

S.	Course Outcome	Program Outcomes (PO)
No.		& Program Specific
		Outcomes (PSO)
1.	<b>CO1:</b> To Unterstand the overview of Database	PO1,PO2,PO3,PSO1
	To learn the types of system architectures commercial	
	relational database system	
2.	CO2Understand the various concepts about the	PO1, PO3, PO9, PSO3
	distributed databases and its architectures.	
3.	CO3:Understand the basic concepts of Concurrecy	PO1,PO2,PO9,PO4
	control, Times & validation based protocols, Predicate	
	reads	
4.	CO4:Understand and analyze the database storage structures	PO2, PO3,PO9, PSO1
	and access techniques like, indexing methods, hashing	
	methods, query evaluation techniques and and query	
	optimization	

#### PO and PSO mapping with level of strength for Course Name Advanced Data base Management System(Course Code MCA268)

Cos	PO1	PO2	PO3	P04	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2		1		1	2	1	2	1	3	2	2	1	2
CO2	3	2	3	3				2	2	2	1	1	2	3	2	1	2
CO3	3	3	3	3				1	1	1	3	2	3	2	1	1	1
CO4	2	2	2	2	1			2	3	3	3	1	2	2	2	1	3

Scho	ool: SET	Batch : 2019									
Prog	gram: MCA	Current Academic Year: 2019-20									
Bra	nch:	Semester: 4									
1	Course Code	MCA269 Course Name: MCA									
2	Course Title	Mobile technologies									
3	Credits	3									
4	Contact	3-0-0									
	Hours										
	(L-T-P)										
	Course Status	Elective									
5	Course	The objective of the course is to impart knowledge of mobile and	The objective of the course is to impart knowledge of mobile and wireless computing								
	Objective	systems and techniques.									
6	Course	On successful completion of this module students will be able to									
	Outcomes	<b>CO1:</b> Synthesize the basic concepts and principles in mobile computin	g.								
		<b>CO2:</b> Analyze the concept of wireless and their communication.	lity Monogoment								
7	Course	<b>COS:</b> Synthesize the structure and components for mobile repertion $\&$	cellular system								
/	Description	Also impart knowledge of Satellite broadcast system & routing a	algorithms based								
	Description	on wireless network.	ugonumus oused								
8	Outline syllabu	15	CO Mapping								
-	Unit 1	Introduction									
	A	Issues, challenges, and benefits, Mobile radio communication	CO1								
		fundamentals, overview of mobile generation 1G,2G,3G,4G and 5G									
	В	Fundamental of wireless communication, bandwidth concept, type of	CO1,CO2								
		signals, path loss, modulation: shift key modulation, Spread spectrum									
	С	Multiple Access: FDMA, TDMA, CSMA/CD, SDMA, CDMA	CO1 CO2								
	Unit 2	Cellular System	001,002								
	A A	Cell concepts, frequency and channel allocation, frequency reuse	CO1 CO2								
	71	concepts: sectorization and clustering, Handoff	01,002								
	В	Global System for Mobile Communication (GSM) System	CO1.CO2.CO3								
	-	Overview: GSM Architecture, channels, Mobility Management,	001,002,000								
		localization and calling									
	C	General Packet Radio Service (GPRS): GPRS Architecture, GPRS	CO1,CO2								
	Unit 3	Satellite & Broadcast System									
		Basics concents of satellite and Applications types of satellite	CO1								
	A P	Cyclical repetition of data Digital audio/ video broadcasting	C01 $C02$								
	D	Broadcasting convergence and mobile communication	C01,C02								
	С	HD radio, working of DTH (Direct To Home)	CO2								
	Unit 4	Wireless network & Routing Algorithm									
	А	Mobile IP, DHCP, Mobile Adhoc Network, Hidden and exposed	CO2,CO3								
		terminal problems									
	В	Bluetooth, W1-F1 Standard, W1MAX Standard, Zigbee, Ultra- wideband(UWB)	CO2,CO3								
	С	Routing protocols classification, challenges in MANET routing	CO2CO3								
	C	DSDV, DSR, AODV	02,005								
	Unit 5	Mobile Transport Layer									

А	Traditional TC	Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Transaction oriented TCP								
В	TCP over 2.5G	TCP over 2.5G/3G/4G wireless network, File System World Wide Web, Wireless Application Protocol: architecture, protocol stack								
С	World Wide W protocol stack									
Mode of examination	Theory	Theory								
Weightage	CA	MTE	ETE							
Distribution	30%	20%	50%							
Text book/s*	1. Jo E 2. U	<ol> <li>JochenSchiller : Mobile Communication, Pearson Education.</li> <li>U. Hansman and L. Merck : Principles of Mobile Computing" 2nd Ed. Springer</li> </ol>								
Other References	1 2 3 4 5	<ul> <li>D. Milojicic Computers a</li> <li>Willium C. Design and f</li> <li>D. R. communicati</li> <li>Haykin,S a communicati</li> <li>T.S. Rappa Principles an</li> </ul>	<ul> <li>c, F. Douglis. : Mobility Processes, nd Agents", Addison Wesley</li> <li>Y. Lee, "Mobile communication undamentals"</li> <li>KamiloFehar, "Wireless digital on"</li> <li>and Moher,M., "Modern wireless on", Pearson.</li> <li>aport, "Wireless Communication- d practice", Pearson</li> </ul>							

S.	Course Outcome	Program Outcomes (PO)
No.		& Program Specific
		Outcomes (PSO)
1.	<b>CO1:</b> Synthesize the basic concepts and principles in mobile	PO1,PSO4
	computing.	
2.	CO2: Analyze the concept of wireless and their communication.	PO1,PO2,PSO2
3.	CO3:Synthesize the structure and components for mobile IP and	PO1,PO3,PSO1,PSO2
	mobility Management.	

# PO and PSO mapping with level of strength for Course Name Mobile Technologies (Course Code MCA269 )

Cos	POI	PO2	PO3	PO4	PO5	P06	PO7	PO8	909	PO10	PO11	P012	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	1	2	2	2	1	1	1	2	2	2	2	3	1
CO2	3	3	1	1	1	2	2	2	2	2	2	2	2	3	2	2	1
CO3	3	1	3	1	1	1	1	2	1	1	1	1	3	3	2	1	2

Scho	ool: SET	Batch : 2019								
Prog	gram: MCA	Current Academic Year: 2019-20								
Brai	nch:	Semester: 4								
1	Course Code	MCA273 Course Name: MCA								
2	Course Title	Data Mining and Knowledge Discovery								
3	Credits	3								
4	Contact	-0-0								
	Hours									
	(L-T-P)									
	Course Status	Elective								
5	Course	1. Provide students with an overview of the methodologi	es and approaches							
	Objective	to data mining								
		2. Gain insight into the challenges and limitations of diff	ferent data mining							
		techniques								
		3. Provide the students with practice on applying data min	ing solutions							
		4. Prepare students for research in the area of data m	ining and related							
		applications								
		5. Enhance students communication and problem solving skills								
	0	Students will be able to:								
6	Course	<b>CO1</b> : To understand and implement classical algorithms in data	mining a							
	Outcomes	<b>CO2:</b> To assess the strengths and weaknesses of the algorithms	a mining a							
		<b>CO3:</b> To identify the application area of algorithms, and apply t	hem.							
		CO4: To integrating and interpreting the data sets and improvin	g effectiveness,							
		efficiency and quality for data analysis.								
7	Course	This course introduces advanced aspects of data warehousing an	id data mining,							
	Description	encompassing the principles, to analyze the data, identify the pro-	oblems, and							
0	Outling gyllaby	choose the relevant models and argorithms to apply.	CO Manning							
0	Unit 1	Introduction	CO Mapping							
		Evolution of Data mining and introductory concepts	CO1 CO2							
	R	Knowledge Discovery Process	$\begin{array}{c} CO1, CO2 \\ \hline CO1, CO2 \\ \end{array}$							
	D C	Introduction to outlier	$\begin{array}{c} CO1, CO2 \\ \hline CO1, CO2 \end{array}$							
-	Unit 2	Data Prencocessing								
		Descriptive Data Summarization Data Cleaning	CO1							
	<b>A</b>	Desemptive Data Summarization, Data Cleaning,	C01, C02 C04							
	В	Integration and Transformation.	CO1							
			CO2.CO4							
	С	Data Reduction, Discretization and Concept Hierarchy	CO1.							
	_	Generation.	CO2,CO4							
	Unit 3	Frequent Pattern Mining								
	А	Efficient and Scalable Frequent Itemset Mining Methods:	C01,C02,C03							
	-	Aprori								
	В	FPGrowth, ECLATS	CO1,CO2,CO3							
	C	correlation Analysis.	CO4							

Unit 4	Classification	n& Prediction							
А	What is classi	fication, requi	rements of classification, Decision	CO1,CO2,CO3					
	Tree-ID3Algo	orithm, ,							
В	Naive Bayes	Classifier, Rul	e Based classification,	CO1,CO2,CO3					
	Backpropogat								
С	Support Vector	CO1,CO2,CO3							
	Prediction: - I								
Unit 5	Clustering								
А	What is cluste	CO1,CO2,CO3							
В	Partitioning methods-k-means and k-mediods,								
С	Hierarchical N	CO1,CO2,CO3							
	based method	based methods- DBSCAN							
Mode of	Theory								
examination	-								
Weightage	CA	MTE	ETE						
Distribution	30%	20%	50%						
Text book/s*	1. J.Han	M. Kamber, J	. Pei "Data Mining Concepts and						
	Techn	iques",Edition:	3, Morgan Kaufmann						
Other	1. M.H.	Dunham, Data	Mining Introductory and Advanced						
References	Topics	s, Pearson Educ	ation.						
	2. Adria	ans, <i>Data Minin</i>	g, Pearson Education						
	3. Vikrai	nPudi& P. Ra	dhakrishnan, "Data Mining", Oxford						
	Unive	rsity Press							

S	Course Outcome	Program Outcomes (PO) &
5.		
No.		Program Specific
		Outcomes(PSO)
1.	<b>CO1:</b> To understand and implement classical algorithms in	PO1,PO2,PO3,PO4,PSO1
	data mining and data warehousing.	
2.	<b>CO2:</b> To assess the strengths and weaknesses of the	PO1, PO3, PO4, PSO2
	algorithms.	
3.	<b>CO3:</b> To identify the application area of algorithms, and	PO1,PO2,PO3,PO4
	apply them.	
4.	CO4: To integrating and interpreting the data sets and	PO9, PO10, PO11, PSO5
	improving effectiveness, efficiency and quality for data	
	analysis.	

### PO and PSO mapping with level of strength for Course Name Data Mining & Knowledge discovery (Course Code MCA273)

Cos	PO1	PO2	PO3	PO4	PO5	PO6	704	PO8	60d	PO10	P011	P012	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3				2	2	1	2	1	3	2	2	1	2
CO2	3	2	3	3				2	2	2	1	1	2	3	2	1	2
CO3	3	3	3	3				1	1	1	3	2	3	2	1	1	1
CO4	2	2	2	2	1			2	3	3	3	1	2	2	2	1	3

Sch	nool: SET	Batch : 2019								
Pro	ogram: MCA	Current Academic Year: 2019-20								
Bra	anch:	Semester: IV								
1	Course Code	MCA271 Course Name: MCA								
2	Course Title	Cloud Computing								
3	Credits	3								
4	Contact	3-0-0								
	Hours									
	(L-T-P)									
	Course	Elective								
	Status									
5	Course	1. Provide students with an overview of the fundamental of	concepts of Cloud							
	Objective	Computing.								
		2. Gain insight into the challenges and limitations Models of c	cloud computing.							
		3. To learn the various technologies of the cloud computing p	paradigm and learn							
		about recent advances in Cloud Computing and enabling tea	chnologies.							
		4. Prepare students for research in the area of cloud Computi	ng risks and cloud							
		security challenges.	C							
		5. Enhance students communication and problem solving skills								
6	Course	urse Students will be able to:								
Ŭ	Outcomes	<b>CO1:</b> To understand the cloud computing Concepts.								
	0 000 000000	CO2:Explain how and why this paradigm came about and the inf	luence of several							
		enabling technologies like Virtualization (e.g. VMware) and Goo	gle file systems							
		<b>CO3:</b> Build cloud based applications using MS Azure, Amazon A	AWS and/or							
		Google App Engine.	•,							
		cO4: Understanding of Cloud Computing fisk issues and Cloud	security							
7	Course	This course introduces advanced aspects of Cloud Computing en	compassing the							
'	Description	principles, to analyze the cloud, identify the problems, and choos	e the relevant							
	Description	models and algorithms to apply.								
8	Outline syllabu	15	CO Mapping							
	Unit 1	Introduction Cloud Computing								
	А	Introduction to distributed systems, Defining Cloud	CO1, CO2							
		Computing, Understanding of Cloud Architecture:								
		Composability, Infrastructure, Platform, Virtual Appliances,								
		Communication Protocols, Applications, Understanding								
	I I	Services: Saas, Paas, Iaas								
		Advanced Load Polyneing, the Google Cloud, Virtual machine	CO1 CO2 CO4							
	А	types VMware vSphere Understanding Machine Imaging	01, 02,004							
		Porting Applications.								
		Storage in the Cloud:								
		Google file system.								
	Unit 3	Cloud Computing with the Titans								
	A	Google Web Services: Google app Engine, Google Web	CO1.CO2.CO3							
	-	Toolkit. Amazon: Amazon Elastic Cloud Computing, Amazon								

	Simple Storage System, Amazon Block Store (EBS).	
Unit 4	Cloud Computing Risk Issues	
A	The CIA Triad: Confidentiality, Integrity, And Availability. Privacy and Compliance: PCI DSS, Information Privacy and Privacy law. Common Threats and Vulnerability: Logon Abuse, Inappropriate System Use, Eavesdropping, Denial-of- service (DoS) Attack, Session Hijacking Attack. Cloud Service Provider (CSP) Risks: Back Door, Spoofing, Replay Attack, Social Engineering Attack, Dumpster Diving, Trojan Horse and Malware.	CO1,CO2,CO3
 Unit 5	Cloud Computing Security Challenges	
А	Security Policy Implementation, Policy Types: Senior Management Statement of Policy, Regulatory Policies, Advisory Policies, And Informative Policies.	CO1,CO2,CO3
Mode of examination	Theory	
Weightage Distribution	CA	MTE
	30%	20%
Text book/s* Other References	<ol> <li>Barrie Sosinsky "Cloud Computing (Bible)", Wiley</li> <li>Anthony T.Velte, Toby J. Velte, Robert Elsenpeter"Cloud Computing: A Practical Approach" TATA McGRAW-HILL Edition.</li> <li>Ronald L. Krutz and Russell Dean Vines, "Cloud Security: A comprehensive Guide to Secure Cloud Computing", WILEY.</li> </ol>	

S.	Course Outcome	Program Outcomes (PO)
No.		& Program Specific
		Outcomes (PSO)
1.	<b>CO1:</b> To understand and implement classical algorithms in	PO1,PO2,PO3,PO4,PSO1
	data mining and data warehousing.	
2.	CO2: To assess the strengths and weaknesses of the	PO1, PO3, PO4, PSO2
	algorithms.	
3.	<b>CO3:</b> To identify the application area of algorithms, and apply	PO1,PO2,PO3,PO4
	them.	
4.	CO4: To integrating and interpreting the data sets and	PO9, PO10, PO11, PSO5
	improving effectiveness, efficiency and quality for data	
	analysis.	

Cos	IOJ	204	PO3	P04	504	90d	PO7	804	60d	PO10	PO11	PO12	IOSA	PSO2	PSO3	PSO4	50S4
CO1	3	3	3	3				2	2	1	2	1	3	2	2	1	2
CO2	3	2	3	3				2	2	2	1	1	2	3	2	1	2
CO3	3	3	3	3				1	1	1	3	2	3	2	1	1	1
CO4	2	2	2	2	1			2	3	3	3	1	2	2	2	1	3

PO and PSO mapping with level of strength for Course Name Cloud Computing (Course Code MCA 271)

Sch	ool: SET	Batch : 2019						
Pro	gram: MCA	Current Academic Year: 2019-20						
Bra	nch:	Semester: IV						
1	Course Code	MCA272 Course Name: MCA						
2	Course Title	Android Application Development						
3	Credits	3						
4	Contact	3-0-0						
	Hours							
	(L-T-P)							
	Course Status	Elective						
5	Course Describe the components and structure of a mobile development frameworks							
	Objective (Android SDK and Eclipse Android Development Tools (ADT)) and learn how and							
	-	when to apply the different components to develop a working	system.					
6	Course	On successful completion of the course, the student will:						
	Outcomes	1. Design App user Interface						
		3 Implement relational Databases on devices using SC	)Lite					
		4. Examine the usage of commonly available device ser	usors while building					
		e						
7	Course	The course will introduce concepts of the Android platform,	Android application					
	Description	lso help students to build						
-		applications according to their problem statements.	~~~					
8	Outline syllabu	18	CO Mapping					
	Unit 1	Introduction to Android						
	A	Android architecture, Feature of android, Limitation of	COI					
	D	Mobile devices	CO1					
	D C	Configuration of APK file for android project. Test run of	<u>CO1</u>					
	C	application on device	COI					
-	Unit 2	Android UI Components						
	A	Lavouts-Linear lavout, Relative lavout, Table lavout,	CO1 CO2					
		Frame layout	001,002					
	В	Button, TextView, EditTextView, Label, List, Radio	CO1,CO2					
		Button, Checkbox						
	C	Concept of intent, configuration of intent, Intent filters	C01,C02					
	Unit 3	Services and Notification						
	A	Services- states and life cycle	CO1					
		Services states and ne eyere	01					
	В	Type of notification, Toast notification, status bar	C01,C02					
	В	Type of notification, Toast notification, status bar notification	C01,C02					
	B C	Type of notification, Toast notification, status bar         notification         Creating Menu Option Menu, Context Menu         Working with SOL Life	C01,C02 C01,C02					
	B C Unit 4	Type of notification, Toast notification, status bar notification         Creating Menu Option Menu, Context Menu         Working with SQL Lite         Introduction	C01,C02 C01,C02					
	B C Unit 4 A	Type of notification, Toast notification, status bar notification         Creating Menu Option Menu, Context Menu         Working with SQL Lite         Introduction to SQLite database, Steps for connecting application with database	C01,C02 C01,C02 C03					
	B C Unit 4 A	Type of notification, Toast notification, status bar notification         Creating Menu Option Menu, Context Menu         Working with SQL Lite         Introduction to SQLite database, Steps for connecting application with database.         Fetch and undate data in database from application	CO1,CO2 CO1,CO2 CO3					
	B C Unit 4 A B	Type of notification, Toast notification, status bar notification         Creating Menu Option Menu, Context Menu         Working with SQL Lite         Introduction to SQLite database, Steps for connecting application with database.         Fetch and update data in database from application,         Cursor and content value opening and closing database	CO1,CO2 CO1,CO2 CO3 CO3 CO3					
	B C Unit 4 A B C Unit 5	Type of notification, Toast notification, status bar notification         Creating Menu Option Menu, Context Menu         Working with SQL Lite         Introduction to SQLite database, Steps for connecting application with database.         Fetch and update data in database from application,         Cursor and content value, opening and closing database         Sensor Device	CO1,CO2 CO1,CO2 CO3 CO3 CO3 CO3					

А	Sensor Manager, Senso	or Framework, Types of Sens	sors	CO2,CO4					
В	Accelerometer, Gyroso Light Sensor	cope, Proximity Sensor, Ori	entation,	CO2,CO4					
С	nsors on	CO2,CO4							
Mode of examination	Theory	Гћеогу							
Weightage	СА	MTE	ETE						
Distribution	30%	20%	50%						
Text book/s*	1. Anubhav Pradhan and Apply Using Android, 1s	1. Anubhav Pradhan and Anil V. Deshpande, Composing Mobile Apps: Learn, Explore, Apply Using Android, 1st Edition, Wiley India.							
Other References	1. Wei-Meng Lee , Begin 2. Neil Smyth ,Android S	ning Android 4 Application De tudio Development essentials-A	velopment Android 6						

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes			
		(PSO)			
1.	CO1:Design App user Interface	PO4,PO5,PSO4			
2.	CO2:Perform Event driven programming	PO3,PO5			
3.	CO3:Implement relational Databases on devices using	PO4,PO5,PO9			
	SQLite				
4.	CO4:Examine the usage of commonly available device	PO5,PO7,PO12,PSO4			
	sensors while building Android App				

# PO and PSO mapping with level of strength for Course Name Android Application Development (Course Code MCA272 )

	COs	201	202	203	204	205	206	207	208	600	010	011	012	SOI	S02	SO3	SO4
			I	I		1	I	-	I	I	Ч	Ч	Ч	Ъ	Ч	Р	Ρ
CSF	CO1	1	2	2	3	3	2	1	2	2	2	2	2	1	2	2	3
CDL	CO2	2	2	3	2	3	1	1	2	2	2	1	2	2	2	2	2
	CO3	2	1	2	3	3	1	2	-	3	2	2	2	-	1	1	2
	CO4	2	1	1	1	3	1	3	-	2	1	2	3	-	2	1	3

		Batch : 2019	]							
S	School: SET	Current Academic Year: 2019-20								
		Semester: 4th								
1	Course Code	ARP204								
2	Course Title	Quantitate and Qualitative Aptitude Sill Building								
3	Credits	2								
	Contact									
4	Hours (L-T-P)	1-0-2								
5	Course Objective	To enhance holistic development of students and improve their employability skills. Provide a 360 degree exposure to learning elements of Business English readiness program, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a will have entered the threshold of his/her 2 <sup>nd</sup> phase of employability enhancement and skill building activity exercise.								
6	Course Outcomes	CO1: Learn what is VMOSA (Vision, Mission, Values and Ethics) Communication Process CO2: Communication Styles and flexing and 4 social styles of communication CO3: Understand Listening Skills and Listening Styles CO4: Understanding the Art of giving feedback and probing CO5: Business writing skills and non-verbal communication CO6: MTI Reduction Program   Verbal Abilities - 2 CO7: 2nd Level proficiency in Quant & Aptitude Reasoning abilities								
7	Course Description	This course bundle allows students to build vision, mission and strategy statements while exposing them to various models of communication along with MTI reduction and the 2nd level of quant, aptitude and reasoning abilities								
8		Outline syllabus - ARP204	CO MAPPING							
	Unit 1	Communicate to Conquer								
	А	VMOSA (Vision, Mission, Values and Ethics)  Business Communication - Verbal Communication Skills   Barriers in communication   Basics of effective communication - PRIDE Model	CO1,							
	В	Different styles of communication & style flexing (Based on the 4 social styles-Analytical, Driving, Expressive, Amiable)   Importance of Listening & practice of Active Listening - Sentence Arrangements, Correction Analogies   The Art of Giving Feedbacks   Feedback Skills   Asking fact finding questions- Probing Skills	C02, C03,C04							
	С	Email Etiquette   Business Writing Skills  Telephone Etiquette Skills ( Telephone Handling Skills )   Non Verbal Communication-Kinesics, Proxemics, Paralanguage   MTI Reduction Program   Verbal Abilities - 2	CO5, CO6							
	Unit 2	Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical								
	Α	Coding Decoding , Ranking & Their Comparison Level-2	C07							
	В	Series, Blood Relations & Number Puzzle	C07							
	Unit 3 Quantitative Aptitude									

А	Number System Level 2	C07
В	Vedic Maths Level-2   Probability   Permutation & Combination	C07
С	Percentage, Profit & Loss ,Partnership, Simple Interest & Compound Interest	C07
Weightage Distribution	( CA )Class Assignment/Free Speech Exercises / JAM - 60%   (ETE) Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude - 40%	
Text book/s*	<ul> <li>Wiley's Quantitative Aptitude-P Anand   Quantum CAT - Arihant Publications  </li> <li>Quicker Maths- M. Tyra   Power of Positive Action (English, Paperback, Napoleon Hill)</li> <li>Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness - Nathaniel Brandon   Goal Setting (English, Paperback, Wilson Dobson</li> </ul>	

### Semester V

Sch	ool: SET	Batch : 2019					
Pro	gram: MCA	Current Academic Year: 2019-20					
Bra	nch:	Semester: 5					
1	Course Code	MCA361 Course Name: MCA					
2	Course Title	Python Programming Concepts					
3	Credits	3					
4	Contact						
	Hours	3-0-0					
	(L-T-P)						
	Course Status	Regular					
5	Course	Emphasis is placed on procedural programming, algorithm de	sign, and language				
	Objective	constructs common to most high level languages and Email	handling through				
6	Course	Python Programming.	hla ta				
0	Course	CO1 Apply decision and repetition structures in program design	idle id:				
	Outcomes	CO2. Implement methods and functions to improve readability	of programs.				
		CO3. Demonstrate the use of Python lists, tuples and dictionar	ies				
		CO4. Describe and apply object-oriented programming method	dology.				
		CO5. Apply top-down concepts in algorithm design.					
		CO6. Write Python programs to illustrate concise and efficient	algorithms				
7	0	Deduce is a language with a simple content of a second state	C 1:1				
/	Course	Python is a language with a simple syntax, and a powerful se	This course is on				
	Description	introduction to the Python programming language for stud	ents without prior				
		programming experience. We cover data types, control flo	w, object-oriented				
		programming and Email handling	·				
8	Outline syllabu	S	CO Mapping				
	Unit 1	Introduction					
	А	Introduction: History, Python architecture, Variables,	CO5				
		Data Types, Operators. Conditional Statements: If, If-					
		else, Nested if-else.					
		Looping: For, While, Nested loops					
		Control Statements: Break, Continue, Pass					
	В	Lists:Introduction, Accessing list, Operations, Working	CO1,CO5				
		with lists, Functionand Methods with Lists					
	C	<b>Tuple:</b> Introduction, Accessing tuples, Operations,	C01,CO5				
		Working, Functions and Methods with Tuples					
	Unit 2	Dictionary, Functions and Exceptions					
	A	Dictionaries :Introduction, Accessing values in	CO3				
		dictionaries, Working with dictionaries, Functions					
	В	<b>Functions:</b> Defining a function. Calling a function	CO3				
	_	Types of functions, Function Arguments, Anonymous					
		functions, Global and local variables					
	С	<b>Exception Handling</b> : Definition Exception.	CO3				
		Exceptionhandling ,Except clause, Try ? finally clause,					

	User Defined Exceptions						
Unit 3	at 3 Modules, Email Processing						
А	Modules: Importing module, Math module, Random module, Matalotlib, Backages	C02,CO6					
Л	Contracting Harry Threes h Engels	<u> </u>					
В	Contacting User Inrough Emails Using Python:	02,006					
C	Deading from file and conding amails to all years	CO2CO6					
C	Reading from the and sending emails to all users	02,006					
 TT:4 /	Addressing them directly for marketing						
Unit 4	Object oriented programming	<u> </u>					
А	<b>.OOPs concept</b> : Class and object, Attributes, Inheritance	C04					
B	Overloading Overriding Data hiding	CO4					
D	overloading, overloading, Data inding	04					
С	<b>Python File Operation:</b> Opening, Closing, Reading, Writing operation into files. Manipulating File Pointer	CO4					
Unit 5							
A	<b>Python Database Interaction</b> : SQL Database connection using python, Creating and searching tables,	C02,CO5,CO6					
В	Reading and storing config information on database	C02.CO5.CO6					
C	Programming using database connections	C02,CO5,CO6					
Mode of examination	Theory						
Weightage	CA MTE ETE						
Distribution	30% 20% 50%						
Text book/s*	1. The Complete Reference Python, Martin C. Brown, McGrwHill						
Other	1. Introduction to computing in problem solving using						
References	<ul> <li>Python, E Balahurusamy, McGrwHill</li> <li>Introduction to programming using Python, Y. Daniel Liang, Pearson</li> <li>Mastering Python, Rick Van Hatten, Packet Publishing House</li> <li>Starting out with Python, Tony Gaddis, Pearson</li> </ul>						

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1. Apply decision and repetition structures in program design.	PO1,PO2,PO4,PSO1,PSO2
2.	CO2. Implement methods and functions to improve readability of programs.	PO1,PO5,PO2,PO3,PSO5,PSO2
3.	CO3. Demonstrate the use of Python lists, tuples and dictiaonries	PO2.PO3,PO1,PO5,PO11,PSO1,PSO,2
4.	CO4. Describe and apply object-oriented programming methodology.	PO2.PO3,PO1,PO5,PO11,PSO1,PSO,2
5.	CO5. Apply top-down concepts in algorithm design.	PO2.PO3,PO1,PO5,PO11,PSO1,PSO,2
6.	CO6. Write Python programs to illustrate concise and efficient algorithms	PO2.PO3,PO1,PO5,PO11,PSO1,PSO,2

#### PO and PSO mapping with level of strength for Course Name Python Programming Concepts (Course Code MCA 361)

COs	P01	P02	PO3	P04	PO5	PO6	P07	PO8	PO9	PO10	P011	P012	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	2	2	1	-	-	-	1	-	1	-	2	2	1	2	3
CO2	3	3	3	3	3	-	-	-	3	-	3	-	3	3	3	3	3
CO3	3	3	3	3	2	-	-	-	3	-	2	-	3	3	2	2	2
CO4	2	2	2	1	2	-		-	2	-	1	-	2	1	1	2	1
CO5	1	3	1	1	2				1		2		1	2	2	1	1
CO6	2	2	2	2	3				1		2		2	1	1	2	2

Sch	ool: SET	Batch : 2019						
Pro	gram: MCA	Current Academic Year: 2019-20						
Bra	nch:	Semester: V						
1	Course Code	MCA362 Course Name: MCA						
2	Course Title	Web and its application						
3	Credits	3						
1	Contact	3-0-0						
4	Lours	J-0-0						
	$(\mathbf{L} \mathbf{T} \mathbf{D})$							
	(L-I-F)	Compulsory						
~	Course Status	Compulsory	nd without database					
5	Course	Students will gain the skills and project-based experience needed	for entry into web					
	Objective	application and development careers.	for entry into web					
6	Course	On successful completion of this module students will be able to	:					
	Outcomes	1. Design interactive web pages by applying CSS						
	outcomes	2. Design web page which has animation and dynamic data						
		3. Design web pages/site having validation on user data access.						
7	0	4. Develop web site for small business and organization or for i	ndividual					
/	Course	This course is an overview of the modern web technologies use	basis					
	Description	development. The purpose of this course is to give students the	Dasic					
		understanding of now unings work in the web world from the te						
0	Outling gulleby		CO Manning					
0	Unit 1	5 HTML & HTML 5	CO Mapping					
		HTML& HTML 5	<u> </u>					
	A	implementation image man table formatting form design	003,004					
	B	Page layout design using frame, div and span tag, iframe, embed	$CO^2$					
	D	file/object with web pages, DHTML	CO2,					
	C	HTML5: New elements canvas offline webnage HTML Media:	CO3, CO4					
	C	video, audio, HTML API: geolocation, location storage	005,004					
	Unit 2	CSS & CSS3						
	А	CSS & CSS3: Introduction, syntax, selector, text formatting,	CO1. CO4					
		margin, align, Positioning, background formatting						
	В	Navigation bar, and image gallery	CO1, CO4					
	С	CSS3: Introduction, colors, text formatting, fonts formatting,	CO1,CO2,CO4					
		Background formatting, 2D transform, animation						
	Unit 3	Java Script						
	А	Java Script: Introduction, syntax, comment, statement, variable,	CO3,CO4					
		operators, Conditional statements, looping statements						
	В	Functions, object, events, Accessing form elements, validating form	CO1,CO2,					
		elements,	CO3,CO4					
	С	Animation & special effects using JavaScript: rollover effects,	CO1, CO2,					
		image slider, auto content update	CO3.CO4					
	Unit 4	Jquery& AJAX	,					
	A	Jquery& AJAX: Introduction, syntax, selector, events, Jquery	CO1.CO3 CO4					
		effect: hide/show, fade, slide, animate and stop	201,000,001					
	В	Jquery HTML: get, set, add, remove, css	CO1,CO3,CO4					
	С	AJAX: Introduction, request, response, event	C01,C03,C03					
	Unit 5	РНР						

Δ	<b>PHP</b> :Introduct	ion open so	urce tools fo	or PHP	application	CO1 CO2 CO3					
Λ	development, s	yntax, variables	s, operators		upplication	01,002,005					
В	Conditional sta	Conditional statement, iterative statements, array, function, handling									
	form data, send	ing mail, Uploa	ad file, session n	nanagemei	nt, error and						
	exception hand	ling									
С	Filters, PHP-O	DBC connectivi	ity			CO1,CO2,CO3					
Mode of	Theory										
examination	-										
Weightage	CA	MTE	ETE								
Distribution	30%	20%	50%								
Text book/s*		•	•								
	1. Ivan E	ayross,"HTML	,DHTML, Java	Script, Per	l & CGI",						
	BPB I	ublication									
	2. Steven	h Holzner,"PHP	: The Complete	Reference	e",						
	TataM	cGraw Hill Pul	olication		,						
Other	1. Rick I	Delorme," Progr	ramming in HTN	ML5 with .	JavaScript						
References	and C	SS3", Microsof	t								
References	2. Burdn	2. Burdman, "Collaborative Web Development" Addison									
	Wesle	у.		-							
	3. Chris	Bates, "Web Pr	ograming Build	ling Interne	et						
	Applie	cations", Latest	Edition, WILEY	Υ.							

S.	Course Outcome	Program Outcomes (PO) & Program
No.		Specific Outcomes (PSO)
1.	CO: Design interactive web pages by applying CSS.	PO3,PO5,PO8,PO12,PS01,PSO3,PSO4
1.	CO2: Design web page which has animation and dynamic data	PO3,PO5,PO8,PO10,PSO3,PSO4
2.	CO3: Design web pages/site having validation on user data access.	PO3,PO4,PO5,PO8,PO10, PS01,PSO3,PSO4
3.	CO4: Develop web site for small business and organization or for individual	PO3,PO4,PO5,PO8,PO10, PO12,PSO3,PSO4

# PO and PSO mapping with level of strength for Course Name Web and its Applications (Course Code MCA 362)

Cos	PO1	P02	PO3	P04	PO5	PO6	P07	PO8	P09	P010	P011	P012	PSOI	PSO2	PSO3	PSO4
CO1	1	-	3	1	3	2	-	3	2	2	2	3	3	-	3	3
CO2	2	-	3	2	3	2	-	3	1	3	2	3	2	-	3	3
CO3	1	-	3	3	3	2	-	3	1	3	2	3	3	-	3	3
CO4	2	-	3	3	3	2	-	3	2	3	2	3	2	-	3	3

Scho	ool: SET	Batch: 2019						
Prog	gram: MCA	Current Academic Year: 2019-20						
Bra	nch:	Semester: 5						
1	Course Code	MCP361						
2	Course Title	Python Programming Concepts Lab						
3	Credits	1						
4	Contact Hours							
	(L-T-P)	0-0-2						
	Course Status	Regular						
5	Course	Emphasis is placed on procedural programming, algorithm des	sign, and language					
	Objective	constructs common to most high level languages and Email	handling through					
6	Course	Upon successful completion of this course, the student will be	able to:					
0	Outcomes	CO1. Apply decision and repetition structures in program desi	ign.					
	Outcomes	CO2. Implement methods and functions to improve readabilit	y of programs.					
		CO3. Demonstrate the use of Python lists, tuples and dictional	ries					
		CO4. Describe and apply object-oriented programming metho	dology.					
		CO5. Apply top-down concepts in algorithm design.	. 1 .1					
		CO6. Write Python programs to illustrate concise and efficien	t algorithms					
7	Course	Python is a language with a simple syntax, and a powerful se	et of libraries. It is					
	Description	widely used in many scientific areas for data exploration.	This course is an					
	2 comption	introduction to the Python programming language for stude	ents without prior					
		programming experience. We cover data types, control flo	w, object-oriented					
		programming and Email handling	~ ~ ~ ~ .					
8	Outline syllabus		CO Mapping					
	Unit 1	Practical based on conditional statements and control structures						
		1. Program to implement all conditional statements	CO1					
		2. Program to implement different control structures	001					
	Unit 2	Practical related to List, Tuples and ictionaries						
		1. Program to implement operations on lists	CO1,CO2,CO3					
		2. Program to implement operations on Dictionary						
		3. Program to implement operations on Tuple						
	Unit 3	Practical related to Functions and Exception						
		Handling						
		1. Program to implement Exception Handling	CO2,CO5					
		2. Program to use different functions						
	Unit 4	Practical related to Object Oriented Programming						
		Program to use object oriented concepts like inheritance,	CO4,CO6					
		overloading polymorphism etc.	,					
		Program for file handling						
	Unit 5	Practical related to Database						
		Program to make connections with different databases	CO6,CO4,CO2					
		Program to access database						

Mode of examination	Practical and							
Weightage	CA	MTE	ETE					
 Distribution	60%	0%	40%					
Text book/s*	1. The McGr	1. The Complete Reference Python, Martin C. Brown, McGrwHill						
Other References	<ol> <li>Introd Pytho</li> <li>Introd Liang</li> <li>Master House</li> <li>Startin</li> </ol>	luction to compu n, E Balahurusam luction to progra , Pearson rring Python, Ric e ng out with Pythor	iting in problem solving usin y, McGrwHill mming using Python, Y. Dani k Van Hatten, Packet Publishin n, Tony Gaddis, Pearson	ıg el ıg				

Sch	ool:	Batch:	
Pro	gram: BTECH	Current Academic Year:	
Bra	nch:	Semester:	
1	Course Code	MCP362	
2	Course Title	Web and its applications Lab	
3	Credits	1	
4	Contact Hours	0-0-2	
	(L-T-P)		
	Course Status	Provide the knowledge to design and develop web application database. Students will gain the skills and project based experience	n with and without
		web application and development careers. It provides infor	rmation about web
		technologies that relate to the interface between web servers and the	eir clients.
5	Course	On successful completion of this module students will be able	to:
	Objective	<ol> <li>Design interactive web pages</li> <li>Design web pages/site having validation on user data access</li> </ol>	ss.
		3. Develop web site for small business and organization or fo	r individual
	0	4. Client server communication RMI	and for the Wah
6	Course	I his course is an overview of the modern web technologies u development. The purpose of this course is to give students the	lsed for the web
	Outcomes	understanding of how different computers and devices to communic	ate and share
		resources as well as to give the basic overview of the different	technologies.
7	Course	This course is an overview of the modern Web techno	ologies used for
	Description	the Web development. The topics include (although in so	me cases briefly):
		History of the Web, Hypertext Markup Language (HTML), (XUTML) Cocceding Style Sheets (CSS) and JavaSprint	Extensible HTML
8	Outline syllabus	(AHTML), Cascading Style Sheets (CSS), and JavaScript.	CO Mapping
0	Unit 1	INTRODUCTION TO HTML & JAVA SCRIPT	
		1. Write HTML code to design College Website	
		2. Write HTML code to design students	
		registration form	CO1, CO2
		3. Write javascript code to perform validation on	
		above form.	
	Unit 2	AWIL         1         Write a measurem in VML to arreste Droduct Catalact	CO1 CO2
		1. write a program in AIVIL to create Product Catalog.	
		2. Write a program for Product Catalog DTD.	
		3. Write a program to display the XML file data into	
		HTML file.	
	Unit 3	JAVA APPLET & SERVLET	
		1. Write a program to count number of character	CO2,
		in words in the text written in text area.	CO3,CO4
		2. Write a program to draw circle using mouse	
		click event	

Unit 4	3. Write name JDBC JAVA SERV BEANS	e a program to i ,rollno,and bra C ER PAGES & I	nsert and then retrieve nch rom the database using ENTERPRISE JAVA										
	<ol> <li>Write a program to create registration form using jsp.</li> <li>Write a program to describe jsp:param,jsp:include and jsp forward action.</li> <li>Write a program to implement EJB</li> </ol>												
Unit 5	RMI AND JA												
	<ol> <li>Write a p</li> <li>Create Cl Programm</li> <li>Write a p input from is typed.</li> </ol>	CO3,CO4											
Mode of examination	Jury/Practica	l/Viva											
Weightage	CA	MTE	ETE										
Distribution	60%	0%	40%										
Text book/s*	1. Ivan B BPB P 2. Schild 3. Schild												
Other References	1. Rick D and CS												
Scho	ool:	Batch : 2019											
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Prog	gram: MCA	Current Academic Year:											
Bra	nch:	Semester: 5											
1	Course Code	MCA363 Course Name:											
2	Course Title	Business Intelligence											
3	Credits	3											
4	Contact Hours	3-0-0											
	(L-T-P)												
	Course Status	Elective											
5	Course	1 .Provide students with an overview of the methodologies and	approaches to										
	Objective	Business Intelligence											
	2.It focuses on dashboards design by utilizing key performance indicated												
		managers can use to improve day-to-day business operations											
		Provide students to plan and implement BI development projects											
		Prepare student to know the administrative and deployment scenarios & issues BI space.											
6	Course Outcomes	Students will be able to: <b>CO1:</b> Design and develop dashboards <b>CO2:</b> Learn the best practices to work on BI projects. <b>CO3:</b> Use tools to develop, implement and administrate wide range of BI artifacts <b>CO4:</b> Apply various modeling techniques and Apply business intelligence methods to various situations											
7	Course Description	This course have an overall understanding of the major issues and business intelligence including a basic grasp of the algorithm of practices for building successful BI projects.	l applications in classes and best										
8	Outline syllabus		CO Mapping										
0	Unit 1	Introduction to Business Intelligence:	Comapping										
	A	Business Intelligence (BI), Scope of BI solutions and their fitting into existing infrastructure, BI Components and architecture, BI	CO2,CO3										
		components, Future of Business Intelligence, SaaS and Cloud											
	B	Functional areas of BI tools. End user assumptions. Setting up	CO2 CO3										
	D	data for BL Data warehouse OI AP and advanced analytics	02,003										
	С	Supporting the requirements of senior executives including performance management, Glossary of terms and their definitions specific to the field of BI and BI systems.	CO2,CO3										
	Unit 2	Elements of Business Intelligence Solutions:											
	А	Business Query and Reporting, Dashboard design principles, Dashboards and Scorecards Development	CO1,CO2										
	В	Role of Metadata, challenges of Metadata ,Automated Tasks and	CO1,CO2										
		Events											

С	Mobile Busin	ess Intelligenc	e, Software development kit (SDK).	C01,C02						
Unit 3	Building BI	Project:	· · · · · · · · · · · · · · · · · · ·							
А	Stages of Bus	iness Intelliger	nce Projects, Gartner Maturity	CO3,CO4						
	Model, ASUC	G business inte	lligence maturity model							
В	Risk Manager	ment and Mitig	gation, Cost justifying BI solutions	CO3,CO4						
С	measuring suc	ccess. BI Desig	gn and Development.	CO3,CO4						
Unit 4	<b>Reporting</b> :									
А	Metadata Lay	er, Presentatio	n Layer, Data Layer, Use of	CO2,CO3						
	different layer	rs and overall l	Reporting architecture,							
В	Basic Report	authoring, Va	rious report elements such as Charts,	CO2,CO3						
	Tables, prom	ots, Data aggre	gation							
С	Table based,	'able based, Materialized views, OLAP, Ad-hoc reports,								
	interactivity in	nteractivity in analysis (drill down, drill up).								
Unit 5	BI Deployme	ent and Efficie	ency:							
А	Centralized v	Centralized versus Decentralized Architecture, EPM (Enterprise performance Management). Efficiency measures – The CCR model: Definition of target								
_	performance									
В	Efficiency me									
	objectives- Pe									
0	practices; cro	ss efficiency ai	nalysis	004 002						
C	virtual inputs	and outputs –	Other models. Pattern matching –	CO4,CO2						
	cluster analys	is, outlier anal	ysis.							
 Mode of	Theory									
examination	Theory									
Weightage	CA	MTE	ETE							
Distribution	30%	20%	50%							
Text book/s*	1.Jerzy Surm	a,2011, Busin	ess Intelligence: Making Decisions							
	through Data	Analytics, New	w York, N.Y., Business Expert Press							
Other	1. Carlo Verc	ellis, Business	Intelligence: Data Mining and							
References	<b>Optimization</b>	for Decision M	Making, A John Wiley and Sons, Ltd.,							
	Publication									
	2. Ralph K	imball, Marg	y Ross, "The complete Guide to							
	dimensional	modeling L	atest edition, Publisher: Wiley							
	publication IS	SBN- 0-471-20	024-7							
	3. Ralph Ki	mball, Joe Ca	serta," "The data warehouse ETL							
	toolkit: pra	ctical techni	iques for extracting, cleaning,							
	conforming, a	and delivering	data", Publisher: Wiley. ISBN: 0-							
	/645-6/5/-8									

S.	Course Outcome	Program Outcomes (PO) & Program
No.		Specific Outcomes (PSO)
1.	<b>CO1:</b> Design and develop dashboards	PO1,PO3,PO4,PO5,PO9,PO11,PO12
2.	<b>CO2:</b> Learn the best practices to work on BI projects.	PO1, PO3, PO4, PO9, PO12
3.	<b>CO3:</b> Use tools to develop, implement and	PO1,PO2,PO3,PO4,PO5,PO9,PO11,PO12
	administrate wide range of BI artifacts	
4.	<b>CO4:</b> Apply various modeling techniques and Apply	PO1, PO2,PO3,
	business intelligence methods to various situations	PO5,PO9,PO10,PO11,PO12

MCA	COs	PO1	PO2	PO3	P04	PO5	P06	PO7	PO8	P09	PO10	P011	P012	PSO1	PSO2	PSO3	PSO4	PSO5
	CO1	3	-	3	3	3	-	-	-	3	-	3	3	3	-	3	1	3
	CO2	2	-	2	2	-	-	-	-	3	-	-	3	2	-	1	1	-
	CO3	3	3	3	1	3	-	-	-	3	3	3	3	3	3	3	1	3
	CO4	3	3	2	-	3	-	-	-	2	2	2	2	3	3	2	1	2

PO and PSO mapping with level of strength for Course Name Business Intelligence(Course Code MCA363)

Sch	ool: SET	Batch : 2019									
Pro	gram: MCA	Current Academic Year: 2019-20									
Bra	nch:	Semester: V									
1	Course Code	MCA364 Course Name:									
2	Course Title	Cryptography and Network Security									
3	Credits	3									
4	Contact	3-0-0									
	Hours										
	(L-T-P)										
	Course Status	Elective									
5	d communication										
	Objective	networks which are the basic building blocks of all IT infrastructures and the role of cryptography in mitigating these security threats.	based organizations								
6	6       Course       After the successful completion of this course, students will be able										
	Outcomes       CO1: Understanding of threat perception in the computer and communication network and able to recognize the vulnerability in the various layers of the network.         CO2: Analyze the conventional ciphers and steganographic technique which are basic designed to maintain confidentiality of the data.         CO3: Establish the mathematical background for development of symmetric and asymmetric key cryptography.         CO4: Developing skills for implementation of cryptographic tools.         CO5: Comprehend the working knowledge of the security protocols during data communication.										
7	Course	This course introduces the concepts of cryptography and mathe	matical skills								
	Description	needed for implementation of security tools for confidentiality, authentication and authorization in the computer and communic	integrity, ation networks								
8	Outline syllabu	15	CO Mapping								
	Unit 1	Introduction									
	А	OSI Security architecture, Security Attack, Security Services, Security Mechanism and model for network security.	CO1,CO2								
	В	<b>Pre-requisite Mathematics:</b> Number Theory, Integer Arithmetic, Modular Arithmetic, Extended Euclid Algorithm, and Congruence's, Eulers Totient Function, Fermat little Theorem,	CO2,CO3								
	С	Symmetric key cryptosystems. Substitution ciphers, Additive and Multiplicative ciphers, mono-alphabetic and poly alphabetic ciphers. Transposition ciphers, Mechanical and electromechanical systems.	CO2,CO3,CO4								
	Unit 2	Modern Cryptography									
	A	One Time Pad, the Concept of modern cryptography, Random	CO3								
		numbers, Basic tests of randomness.									
	В	Classification of Symmetric Cipner systems, Modes of operation.	C03,C04								
		Stream cipners, KC4, and Block cipners. DES and AES.	03,004								
	Unit 3	Asymmetric Uryptography & Key Exchange	000 000								
	A	Prime Number and Primality Testing- Miller Rabin test,, factorization, Exponentiation- square and multiply method, Discrete logarithms, Chinese Remainder Theorem	CO2,CO3								

 	-									
В	Public Key cry	ptography-RSA	, Cryptanalysis of RSA, Elgamal	CO2,CO3						
С	Management o keys, Symmetr Hellman key ex	f Keys, Key Dis ic Key length, A cchange	tribution Center, Life time of the Asymmetric key length, Diffie	CO3,CO4						
Unit 4	Digital Signat	ures								
А	Digital Signatu Authentication Elgamal	re Algorithms ( protocol- Kerbe	DSA), DSA- variants User eros, Digital Signature –RSA,	CO2,CO3						
В	Iterated Hash f	terated Hash function, characteristics of Hash Functions,								
С	Data integrity a	ata integrity algorithms, MD5, SHA-512								
Unit 5	Security	Security Security at Application layer-Email Architecture, S/MIME, PGP(Scenarios, key rings, PGP Certificates)								
А	Security at App PGP(Scenarios									
В	Security at Tran	nsport layer-SS	L( Services, Protocols)	CO4,CO5						
С	Security at Net Association), In	work layer-IPSe nternet Key exc	ec(Modes, Protocols, Security hange	CO4,CO5						
Mode of examination	Theory									
Weightage	CA	MTE	ETE							
Distribution	30%	20%	50%							
Text book/s*	1. Stallings, V Principles Edition.	<ol> <li>Stallings, W., "Cryptography and Network Security – Principles and Practices", Prentice Hall of India, Fourth Edition.</li> </ol>								
Other References	<ol> <li>Behrouz A McGraw F</li> <li>Bruce Sch Inc, 2001.1</li> </ol>	<ul> <li>Behrouz A. Forouzan, "Cryptography And Network Security"- McGraw Hill</li> <li>Bruce Schneier, "Applied Cryptography", John Wiley &amp; Sons Inc, 2001.Internet as a resource for reference</li> </ul>								

S.	Course Outcome	Program Outcomes (PO) &
No.		Program Specific
		Outcomes (PSO)
1.	CO1: Analyze the conventional ciphers and stenographic technique which are basically designed to maintain confidentiality.	PO1,PO2,PO11,PSO1
2.	CO2: Compare the algorithms developed in modern cryptographic era. (ABET program outcomes a and j)	PO1,PO2,PO3,PSO1,PSO2
3.	CO3: Establish the mathematical background of the ciphers proposed in symmetric and asymmetric key cryptography.	PO1,PO2,PSO1,PSO2
4.	CO4: Comprehend the working knowledge of security protocols during data communication.	PO1,PO2,PSO1,PSO2

CSE	Cos	P01	PO2	PO3	P04	PO5	P06	PO7	PO8	909	PO10	PO11	P012	PSO1	PSO2	PSO3	PSO4	PSO5
	CO1	3	3	1	1	1	1	1	1	1	2	3	2	3	3	1	1	1
	CO2	3	3	3	1	1	2	2	2	2	1	1	1	3	3	1	2	2
	CO3	3	3	2	2	2	1	2	2	2	1	1	1	3	3	1	2	1
	CO4	3	3	2	2	1	1	1	2	2	1	1	2	3	3	1	2	2

PO and PSO mapping with level of strength for Course Name Cryptography & Network security(Course Code MCA 364 )

Sch	ool: SET	Batch : 2019									
Prog	gram: MCA	Current Academic Year: 2019-20									
Bra	nch:	Semester: V									
1	Course Code	MCA365									
2	Course Title	Software Project Management									
3	Credits	3									
4	Contact Hours	3-0-0									
	(L-T-P)										
	Course Status	Non Elective									
5	Course										
	Objective	1. Introduces students with an overview and concepts of management.	of software project								
		2. Gain insight into the challenges and limitations of a	different phases of								
		2 Using techniques for planning manitoring and	antical of confirment								
		3. Using techniques for planning, monitoring and co	ontrol of software								
		projects	1								
		4. Prepare students understand project evaluation and software effort estimation.									
		5. Enhance the managerial and leadership skillsof the students									
6	Course	Students will be able to:									
	outcomes	<ul> <li>CO1: Apply software project management and engineering m projects under taken.</li> <li>CO2:design and conduct a software effort estimation in a project CO3:Develop the ability to lead or, work in a team till the comproject.</li> <li>CO4: Have an ability understand and identify various software management problems, and solve these problems by designing appropriate strategies, and methods.</li> </ul>	<ul> <li>CO1: Apply software project management and engineering methods in the projects under taken.</li> <li>CO2:design and conduct a software effort estimation in a project under taken CO3:Develop the ability to lead or, work in a team till the completion of a project.</li> <li>CO4: Have an ability understand and identify various software project nanagement problems, and solve these problems by designing and selecting appropriate strategies, and methods.</li> </ul>								
7	Course Description	This course introduces concepts of software project mana Project Planning, Project Evaluation, Software Effort estimation control and Managing contracts tools and techniques are include	agement in which on, Monitoring and led.								
8	Outline syllabu	S	CO Mapping								
	Unit 1	Introduction									
	А		CO1, CO2								
		Introduction to software project management, software									
		projects versus other types of project,									
	В	activities covered by software project management, the   CO1, CO2									
		project as a system, problems with software projects,									
	C	information and control in organization.	CO1, CO2								
	Unit 2	Project Planning									

	А	Introduction to identify project	o step wise pro ct scope and ob	ject planning, select project, pjectives,	CO1, CO2,CO4							
	В	identify projection identify projection	et infrastructur	e, analyze project characteristics, l activities,	CO1, CO2,CO4							
	С	estimate effor allocate resour lower levels o	t for each activ rces, review/pu f planning	ity, identify activity risk, ablicize plan, execute plan and	CO1, CO2,CO4							
	Unit 3	Project Evalu	ation									
	А	Strategic asses analysis, cash	ssment, Techni flow forecasti	ical assessment: cost-benefit	C01,C02,C03							
	В	cost-benefit ev	valuation techr	niques, risk evaluation.	C01,C02,C03							
	С	Application de process model	evelopment mo	odels: the waterfall model, the V- odel, software prototyping, tools	CO4							
	Unit 4	Software Effe	Software Effort estimation									
	А	Introduction, V and under esti	ntroduction, Where are estimates done?, problems with over and under estimates,									
	В	the basis for so techniques, ex function point	the basis for software estimating, effort estimation techniques, expert judgment, estimating by analogy, Albert function point analysis,									
	С	Function poin publishing the scheduling sec	Function points MARK II, object points, COCOMO, publishing the resource schedule, cost schedule, the scheduling sequence									
	Unit 5	Monitoring a	nd Managing	contracts								
	А	Creating the fr	CO1,CO2,CO3									
	В	prioritizing me change contro	onitoring, getti 1.	ng the project back to target,	CO1,CO2,CO3							
	С	Managing com placement, typ contract mana	tracts: types of a pical terms of a gement, accep	f contract, stages in contract a contract, contract management, tance.	CO1,CO2,CO3							
	Mode of examination	Theory										
	Weightage	CA	MTE	ETE								
	Distribution	30%	20%	50%								
	Text book/s*	1. Software										
-		Other References2. Software Project Management A Unified Framework, Walker Royce, Addison-Wesley 3. A practitioner's Guide to Software Engineering, Roger Pressman, Tata McGraw Hill 2014 8th edition. 4. Basics of Software Project Management, NIIT, Prentice- Hall India, Latest Edition.										

S.	Course Outcome	Program Outcomes (PO)
No.		& Program Specific
		Outcomes (PSO)
1.	<b>CO1:</b> Apply software project management and engineering methods in the projects under taken.	PO1,PO2,PO3,PO4,PSO1
2.	<b>CO2:</b> design and conduct a software effort estimation in a project under taken	PO1, PO3, PO4, PSO2
3.	<b>CO3:</b> Develop the ability to lead or, work in a team till the completion of a project.	PO1,PO2,PO3,PO4
4.	<b>CO4:</b> Have an ability understand and identify various software project management problems, and solve these problems by designing and selecting appropriate strategies, and methods.	PO9, PO10,PO11

# PO and PSO mapping with level of strength for Course Name Software Project Manageent (Course Code MCA 365)

Cos	P01	P02	PO3	PO4	PO5	P06	PO7	PO8	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3				2	2	1	2	1	3	2	2	1
CO2	3	2	3	3				2	2	2	1	1	2	3	2	1
CO3	3	3	3	3				1	1	1	3	2	3	2	1	1
CO4	2	2	2	2	1			2	3	3	3	1	2	2	2	1

Sch	ool: SET	Batch : 2019										
Pros	gram: MCA	Current Academic Year: 2918-19										
Bra	nch:	Semester: V										
1	Course Code	MCA366 Course Name										
2	Course Title	Big Data Analytics										
3	Credits	3										
4	Contact	3-0-0										
-	Hours											
	(L-T-P)											
	Course Status	Elective										
5	Course	Understand the Big Data Platform and its Use cases										
	Objective	Provide an overview of Apache Hadoop										
	5	<ul> <li>Provide HDFS Concepts and Interfacing with HDFS</li> </ul>										
		Understand Map Reduce Jobs										
		• Provide hands on Hodoop Eco System										
		• Apply analytics on Structured, Unstructured Data.										
6	Course	The students will be able to:										
0	Outcomes	• Identify Big Data and its Business Implications.										
	Outcomes	• List the components of Hadoop and Hadoop Eco-System										
		Access and Process Data on Distributed File System	Process Data on Distributed File System									
		<ul> <li>Manage Job Execution in Hadoop Environment</li> </ul>										
		Develop Big Data Solutions using Hadoop Eco System										
7	0											
/	Course											
0	Description		CO Manning									
0	Uutifie synabu	S	CO Mapping									
		Types of Digital Data Introduction to Big Data Big Data	CO1 CO2									
	A	Analytics History of Hadoon Anache Hadoon	01,002									
	В	Analysing Data with Unix tools. Analysing Data with	CO1. CO2									
	2	Hadoop, Hadoop Streaming,	001,002									
	С	Hadoop Echo System, IBM Big Data Strategy, Introduction	CO1, CO2									
		to Infosphere BigInsights and Big Sheets.										
	Unit 2	HDFS(Hadoop Distributed File System)										
	А	The Design of HDFS, HDFS Concepts, Command Line	CO1,									
		Interface	CO2,CO4									
	В	Hadoop file system interfaces, Data flow, Data Ingest with	CO1,									
	Flume and Scoop and Hadoop archives, CO2,CO4											
	C	Hadoop I/O: Compression, Serialization, Avro and File-	CO1,									
		Based Data structures	CO2,CO4									
	Unit 3	Map Reduce										
	A	Anatomy of a Map Reduce Job Run, Failures, Job Scheduling	CO1,CO2,CO3									
	В	Shuffle and Sort, Task Execution,	CO1,CO2,CO3									
	С	Map Reduce Types and Formats, Map Reduce Features. CO4										
	Unit 4	Hadoop Eco System										

А	<b>Pig</b> : In Compariso Defined F	troduction to H on of Pig with I unctions, Data Pr	PIG, Execution Modes of Pig, Databases, Grunt, Pig Latin, User occessing operators.	CO1,CO2,CO3									
В	Hive: H	Hive: Hive Shell, Hive Services, Hive Metastore,											
	Compariso	, ,											
	Querying												
С	Hbase : H RDBMS.	<b>Hbase :</b> HBasics, Concepts, Clients, Example, Hbase Versus RDBMS. Big SQL : Introduction											
Unit 5	Data Ana												
А	Introductio	Introduction, Supervised Learning, Unsupervised Learning,											
В	Collaborat	tive Filtering		CO1,CO2,CO3									
С	Big Data A	Analytics with Bi	gR.	CO1,CO2,CO3									
Mode of examination	Theory												
Weightage	CA	MTE	ETE										
Distribution	30%	20%	50%										
Text book/s*	1. To on	om White " Hadoo , O'reily Media, 20	pp: The Definitive Guide" Third Edit 012.										
	2. Se Ai	eema Acharya, S nalytics" Wiley 20	Subhasini Chellappan, "Big Data 15										
Other	1. M	lichael Bertholo	d, David J. Hand, "Intelligent										
References	D	ata Analysis", S	Springer, 2007.										
	2. J A	lay Liebowitz, nalytics" Auer	, "Big Data and Business bach Publications, CRC press										
	(2	2013)											
	3. T	om Plunkett,	Mark Hornick, "Using R to										
	U	nlock the Val	lue of Big Data: Big Data										
	A	nalytics with O	racle R Enterprise and Oracle R										
		onnector for H	adoop", McGraw-Hill/Osborne										
		eula (2013), Or	acte press.										
	4. A "N	Mining of M	an and Jei rey David Uiman,										
		niversity Dress	2012										
		mversity 11058,	2012.										

S.	Course Outcome	Program Outcomes (PO)
No.		& Program Specific
		Outcomes (PSO)
1.	CO1 Identify Big Data and its Business Implications.	PO1,PO2,PO3,PO4,PSO1
2.	CO2: List the components of Hadoop and Hadoop Eco-System	PO1, PO3, PO4, PSO2
3.	CO3: Access and Process Data on Distributed File System	PO2,PO3,PO4,PSO3
4.	CO4: Manage Job Execution in Hadoop Environment	PO7, PO10, PO11, PSO5
5	CO5: Develop Big Data Solutions using Hadoop Eco System	PO4,PO8

PO and PSO mapping with level of strength for Course Name Big Data Analytics (Course Code MCA 366)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	909	PO10	P011	P012	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3				2	2	1	2	1	3	2	2	1	2
CO2	3	2	3	3				2	2	2	1	1	2	3	2	1	2
CO3	3	3	3	3				1	1	1	3	2	3	2	1	1	1
CO4	2	2	2	2	1			2	3	3	3	1	2	2	2	1	3
CO5	3	2	3	3	1	-	1	3	2	2	2	2	2	2	2	1	1

Sch	ool: SET	Batch :2019								
Pro	gram: MCA	Current Academic Year: 2019-20								
Bra	nch:	Semester: V								
1	Course Code	MCA367 Course Name: MCA								
2	Course Title	yber Laws								
3	Credits	*								
4	Contact	3-0-0								
	Hours									
	(L-T-P)									
	Course Status	Elective								
5	Course	• Enable learner to understand, explore, and acquir	e a critical							
	Objective	understanding Cyber Law.								
		<ul> <li>Develop competencies for dealing with frauds an</li> </ul>	d deceptions							
		(confidence tricks, scams) and other cyber crimes	s for example,							
		child pornography etc. that are taking place via the	ne Internet;							
		• Make learner conversant with the social and intel	lectual property							
		issues emerging from 'Cyberspace;	•••••							
		• Explore the legal and policy developments in var	ious countries to							
		• Develop the understanding of relationship betwee	an commerce							
		• Develop the understanding of relationship betwee and cyberspace: and								
		<ul> <li>Give learners in depth knowledge of Information</li> </ul>	Technology							
		Act and legal frame work of Right to Privacy. Da	ta Security and							
		Data Protection	au security and							
6	Course	Students will be able to:								
	Outcomes	CO1: Develop competencies for dealing with frauds	and deceptions							
		(confidence tricks, scams) and other cyber crimes for	example, child							
		pornography etc. that are taking place via the Internet								
		CO2: Explore the legal and policy developments in var	ious countries to							
		regulate Cyberspace								
7	Course	This course introduces aspects of cyber security, encompassin	g the principles,							
	Description	to analyze the data, identify the problems, and choose the rele	vant							
8	Outline syllabi		CO Mapping							
0	Unit 1	Introduction to Cyber Security								
		Understanding Computers Internet and Cyber Laws	CO1 CO2							
		intellectual property, defamation. privacy concerns.								
		censorship, cyber fraud, e – commerce law								
		information security legal liabilities. insurance law, the								
		clash of laws, cyber law dispute resolution, the law of								
		linking, cyber crime								
	Unit 2	Protection of Intellectual Property Rights in	CO1,CO2							
		CyberSpace in India, Compensation and Adjudication	, ,							
		of Violations of Provisions of It Act and Judicial								

		•									
	Review, Son	ne important	Offeneces under th	e							
	CyberSpace	Law and the	Internet in India, O	ther							
	Offences une	der the Inform	nation Technology	Act in							
	India										
Unit 3	Role of Evide	ences and Ru	les								
	The Role of	Electronic E	vidence and the		CO1,CO2						
	Miscellaneo	us Provisions	s of the IT Act, Leg	al Aspects							
	of Electronic	of Electronic Records/Digital Signatures, The Rules									
	and Regulati	and Regulations of Certifying Authorities in India									
Unit 4	Cyber Space	Cyber Space Laws									
	International	International Efforts Related to CyberSpace Laws.									
	Fundamenta	l Jurisdiction	Principles Under								
	International	Law, Classi	c U.S. Jurisdiction	Principles,							
	Council of E	conve	ntion on cyber crim	es							
Unit 5	Tools										
	Tools: Cybe	er Check, Tr	ueBack, Hasher,		CO1,CO2						
	EmailTrace	r, Pasco, Nr	nap, BinText								
Mode of	Theory										
examination											
Weightage	CA										
Distribution	30%										
Text book/s*	1. Cybe										
	2. Hand										
	Hoss	HosseinBidgol									
		U									

S.	Course Outcome	Program Outcomes (PO)
No.		& Program Specific
		Outcomes (PSO)
1.	<b>CO1:</b> Develop competencies for dealing with frauds and	PO1,PO2,PO3,PO4,PSO1
	deceptions (confidence tricks, scams) and other cyber	
	crimes for example, child pornography etc. that are	
	taking place via the Internet	
2.	CO2:Explore the legal and policy developments in	PO1, PO3, PO4, PSO2
	various countries to regulate Cyberspace	

PO and PSO mapping with level of strength for Course Name Cyber Laws (Course Code MCA 367)

Cos	P01	PO2	PO3	PO4	PO5	PO6	PO7	PO8	909	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	1	1	1	1	2	2	1	1	1	1	2	1	2	2	1
CO2	3	1	1	2			3	3	2	3	1	1	2	2	2	2	1
CO3	3	1	3	3		1	1	1	1	2	2	1	1	2	1	2	2
CO4	2	2	2	2	2			1	2	1	3	1	1	3	1	2	2

Sch	ool: SET	Batch : 2019										
Prog	gram: MCA	Current Academic Year: 2019-20										
Bra	nch:	Semester: V										
1	Course Code	MCA368 Course Name: MCA										
2	Course Title	Software Testing										
3	Credits	3										
4	Contact	3-0-0										
	Hours											
	(L-T-P)											
	Course Status	Elective										
5	Course	1. This course provides an introduction to the fundamer	ntals of distributed									
	Objective	computer systems,										
	2. Designing Algorithms used in Distributed system.											
		3. Various issues and challenges used in Distributed System	em.									
6	Course	Students will be able to:	da									
	Outcomes	<b>CO1:</b> apply software testing knowledge and engineering method $\mathbf{CO2}$ : design and conduct a software test process for a software	us. testing project									
		<b>CO3:</b> identify the needs of software test automation, and define	and develop a									
		test tool to support test automation.	und de terop u									
		<b>CO4:</b> Have an ability understand and identify various software	testing problems,									
		and solve these problems by designing and selecting software to	est models,									
		criteria, strategies, and methods.										
7	Course	This course introduces the concents of System Analysis algorit	hme design issues									
/	Description	and challenges in Distributed system dentify the problems and	choose the									
	Description	relevant models and algorithms to apply.	choose the									
8	Outline syllabu	s	CO Mapping									
	Unit 1	Fundamental of System Development:										
	А	Overview of software evolution, SDLC, Testing Process,	CO1, CO2									
	_	Terminologies in Testing: Error, Fault, Failure,										
	В	Verification, Validation, Difference between Verification and	CO1, CO2									
	C	Validation, Test Cases,	CO1 CO2									
	C	data: Impracticality of testing All Paths	01,005									
	Unit 2	Test Analysis:										
	A	Boundary Value Analysis, Equivalence Class Testing,	CO1.									
		Decision Table Based Testing,	CO2,CO4									
	В	Cause Effect Graphing Technique. Structural Testing: CO1,										
		Control flow testing,	CO2,CO4									
	С	Path testing, Independent paths, Generation of graph from	CO1,									
		program, Identification of independent paths.	CO2,CO4									
	Unit 3	Regression Testing:										
	Α	Regression Test cases selection, Reducing the number of test	CO1,CO2,CO3									
		cases,.										
	В	Code coverage prioritization technique	CO1,CO2,CO3									

С	Reducing the Priority categories	CO4										
Unit 4	Documentatio	n	¥									
А	Software Tes Testing techni	ting Activities ques and their	: Levels of Testing, Debugging, Applicability,	CO1,CO2,CO3								
В	Exploratory T Data, Approa	Exploratory Testing Automated Test Data Generation: Test Data, Approaches to test data generation,										
С	test data generation To Plan.	test data generation using genetic algorithm, Test Data Generation Tools, Software Testing Tools, and Software test Plan.										
Unit 5	<b>Object Orient</b>	Object Oriented Testing:										
А	Object oriente Object Orient	Object oriented Testing: Definition, Issues, Class Testing, Object Oriented Integration and System Testing. Testing Web Applications: What is Web testing?, User interface Testing.										
В	Testing Web											
С	Usability Test	ing, Security	Testing, Performance Testing.	CO1,CO2,CO3								
Mode of	Theory											
Weighteen	CA	MTE	ETE									
Distribution	2004	2004	50%									
Text book/s*	Yogesh Sing Press, New Y	h, "Software ork, 2012	Testing", Cambridge University									
Other References	<ol> <li>Naresh Ch Oxford uni</li> <li>KK. Engineeri Delhi, 200</li> <li>Roger S. I Practition Internatio</li> <li>Marc Rop Co., Lond</li> <li>Boris Beit Assurance</li> </ol>	<ol> <li>Naresh Chauhan, "Software Testing : Principles and practices", Oxford university press, Latest Edition</li> <li>KK. Aggarwal &amp;Yogesh Singh, "Software Engineering", New Age International Publishers, New Delhi, 2003.</li> <li>Roger S. Pressman, "Software Engineering – A Practitioner's Approach", Fifth Edition, McGraw-Hill International Edition, New Delhi,2001.</li> <li>Marc Roper, "Software Testing", McGraw-Hill Book Co., London, 1994.</li> <li>Boris Beizer, "Software System Testing and Quality Assurance", Van NostrandReinhold, New York, 1984.</li> </ol>										

S.	Course Outcome	Program Outcomes (PO)
No.		& Program Specific
		Outcomes (PSO)
1.	<b>CO1:</b> apply software testing knowledge and engineering methods.	PO1,PO2,PO3,PO4,PSO1
2.	<b>CO2:</b> design and conduct a software test process for a software testing project.	PO1, PO3, PO4, PSO2
3.	<b>CO3:</b> identify the needs of software test automation, and define and develop a test tool to support test automation.	PO1,PO2,PO3,PO4
4.	<b>CO4:</b> Have an ability understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.	PO9, PO10,PO11, PSO5

## PO and PSO mapping with level of strength for Course Name Software Testing (Course MCA 368)

COs	PO1	P02	PO3	P04	PO5	P06	PO7	PO8	PO9	P010	P011	P012	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3				2	2	1	2	1	3	2	2	1	2
CO2	3	2	3	3				2	2	2	1	1	2	3	2	1	2
CO3	3	3	3	3				1	1	1	3	2	3	2	1	1	1
CO4	2	2	2	2	1			2	3	3	3	1	2	2	2	1	3

		Batch : 2019	]
School: SET		Current Academic Year: 2019-20	
		Semester: 5th	
1	Course Code	ARP 301	
2	Course Title	Personality Development and Decision making Skills	
3	Credits	2	
4	Contact Hours (L-T-P)	1-0-2	
5	Course Objective	To enhance holistic development of students and improve their employability skills. Provide a 360 degree exposure to learning elements of Business English readiness program, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a student will have entered the threshold of his/her 3 <sup>rd</sup> phase of employability enhancement and skill building activity exercise.	
6	Course Outcomes	CO1: Understanding Personality and its traits   The art of impression management CO2: Personality Development and Transformation - Value & Ethics - Contribution to the society. CO3: Behavioural and Interpersonal Skills CO4: Avoiding Arguments   The Art of Assertiveness CO5: Argument Handling - Verbal & Writing Skills	
		CO6: The 4M Model   Verbal Abilities-3 CO7: Level 3 of Quant , Aptitude and Reasoning abilities	
7	Course Description	This bundles Training approach attempts to explore the personality, character, and the natural style of the student. This helps to develop character, personality, confidence and interpersonal abilities within the student along with level 3 readiness in quant, aptitude and reasoning skills	
8		Outline syllabus - ARP301	
	Unit 1	Impress to Impact	CO MAPPING
	A	What is Personality?   Who Am I? Creating a positive impression - The 3 V's of Impression   Individual Differences and Personalities	C01
	В	Personality Development and Transformation - Value & Ethics   Building Self Confidence   Behavioural and Interpersonal Skills ( My contribution towards society/ nation)	CO2, CO3
	С	Avoiding Arguments - Essay Writing   The Art of Assertiveness   The Personal Effectiveness Grid   Assessing our Strengths & Limitations and Creating an Action Plan for Learning with the 4M Model   Verbal Abilities-3	CO4, CO5, CO6,
	Unit 2	Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical	
1	Α	Numbers & Digits , Mathematical Operations   Analytical Reasoning	C07
	В	Cubes & Cuboids   Statement & Assumptions	C07
	C	Strong & Weak Argument	C07
			•

	Unit 3	Quantitative Aptitude	
	А	Work & Time ,Pipes & Cistern	C07
	В	Time ,Speed & Distance, Quadratic & Linear Equations, Logs & Inequalities	C07
	С	Sequence & Series, Logarithms, Data Interpretation   Data sufficiency - Level 1	C07
	Weightage Distribution	( CA )Class Assignment/Free Speech Exercises / JAM - 60%   (ETE) Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude - 40%	
	Text book/s*	Wiley's Quantitative Aptitude-P Anand   Quantum CAT - Arihant Publications   Quicker Maths- M. Tyra   Power of Positive Action (English, Paperback, Napoleon Hill)   Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness - Nathaniel Brandon   Goal Setting (English, Paperback, Wilson Dobson	