SACRED HEART COLLEGE (AUTONOMOUS)

Department of Computer Science

BSc Computer Applications

Course plan

Academic Year 2016 - 17

Semester III

COURSE STRUCTURE

Course Code	Title of The Course	No. Hrs./Week	Credits	Total Hrs./Sem
15U3CRCAP05	Data Communication and Computer Networks	4	4	72
15U3CRCAP06	Object Oriented Programming in C++	4	3	72
15U3CRCAP07	System Analysis and Design	4	3	72
15U3PRCAP3	Object Oriented Programming in C++ (Lab)	3	2	54
15U3CRCMT3	Calculus	5	4	90
15U3CRCST3	Probability distribution	5	4	90

PROGRAMME	**BSC COMPUTER APPLICATIONS**	**SEMESTER**	**3**
COURSE CODE AND TITLE	**15U3CRCAP05: DATA COMMUNICATION AND COMPUTER NETWORKS**	**CREDITS**	**4**
HOURS/WEEK	**4**	**HOURS/SEM**	**72**
FACULTY NAME	**Dr. REGITHA M R**		

COURSE OBJECTIVES

- To understand the concepts of data communication, types of communication, topology, categories of network, protocols, standards, transmission modes, ISO-OSI and TCP/IP model.
- To discuss about analog and digital signals, transmission impairment, transmission modes, transmission media and types of switching.
- To discuss different types of error detection and correction methods, types of framing, flow control protocols and random access protocols in data link layer.
- To distinguish different types of connecting devices, wired and wireless LAN in network layer.

- To discuss about the concepts of mobile computing, cloud computing and IoT.
- To discuss about the cyphers used in cryptography.

SESSION	TOPIC	LEARNING RESOURCES	VALUE ADDITIONS	REMARKS
MODULE I: INTRODUCTION TO DATA COMMUNICATION				
1	Components – Data Representation – Data Flow. Networks	Lecture using PPT		
2	Distributed Processing - Network Criteria. Physical Structures: Types of Connection.	Lecture using PPT		
3	Physical Topology: Categories of Topologies – Bus – Star – Ring – Mesh. Categories of Networks: LAN – MAN - WAN.	Lecture using PPT		
4	Protocols and Standards: Protocols – Standards - Standards Organizations.	Lecture using PPT	Video	
5	Protocols and Standards: Protocols – Standards - Standards Organizations.	Lecture using PPT		
6	Transmission modes: Network models – OSI model – seven layers and their functions in OSI model	Lecture using PPT	e-resource	
7	Transmission modes: Network models – OSI model – seven layers and their functions in OSI model	Lecture using PPT		
8	Transmission modes: Network models – OSI model – seven layers and their functions in OSI model	Lecture using PPT		
9	Transmission modes: Network models – OSI model – seven layers and their	Lecture using PPT		

	functions in OSI model			
10	TCP/IP protocol suite.	Lecture using PPT	e-resource	
MODEL II: DATA AND SIGNALS				
11	Analog and Digital Data – Analog and Digital Signals– Periodic and Non-Periodic Signals	Lecture using PPT		
12	Periodic Analog Signals: Sine Wave - Phase - Wave Length	Lecture using PPT	e-resource	
13	Time and Frequency Domain – Composite Signals – Bandwidth.	Lecture using PPT		
14	Digital Signals: Bit Rate - Bit Length. Transmission.	Lecture using PPT	e-resource	
15	Impairment: Attenuation - Distortion – Noise	Lecture using PPT		
16	Transmission Modes: Parallel Transmission – Serial Transmission.	Lecture using PPT		
17	Multiplexing: FDM – TDM	Lecture using PPT		
18	Synchronous and Statistical TDM – WDM, Spreading,	Lecture using PPT	e-resource	
19	Synchronous and Statistical TDM – WDM, Spreading,	Lecture using PPT		
20	Transmission Media: Guided Media – Twisted Pair, Coaxial and Fiber Optic	Lecture using PPT		
21	Transmission Media: Guided Media – Twisted Pair, Coaxial and Fiber Optic	Lecture using PPT		
22	Unguided Media - Radio Waves – Microwaves – Infrared	Lecture using PPT		
23	Unguided Media - Radio Waves – Microwaves – Infrared	Lecture using PPT		

24	Switching: Circuit Switching - Datagram Network.	Lecture using PPT		
MODEL III: DATA LINK LAYER				
25	Error detection and Correction: Types of Errors –	Lecture using PPT		
26	Redundancy – Detection versus Correction – Forward Error Correction versus Retransmission	Lecture using PPT	e-resource	
27	Coding – Modular Arithmetic. Block Coding: Error Detection – Error	Lecture using PPT		
28	Correction – Hamming Distance – Minimum Hamming Distance	Lecture using PPT		
29	Linear Block Codes: Some Linear Block Code	Lecture using PPT	e-resource	
30	Cyclic Codes: Cyclic Redundancy Check – Checksum	Lecture using PPT		
31	Framing: Fixed Size Framing – Variable Size Framing.	Lecture using PPT	e-resource	
32	Flow Control: Noiseless Channel Protocol: Simplest Protocol	Lecture using PPT		
33	Stop and Wait Protocol. Noisy Channel Protocols: Stop and Wait	Lecture using PPT		
34	ARQ – Go Back N ARQ – Selective Repeat ARQ – Piggy Backing	Lecture using PPT	e-resource	
35	**CIA-1**			
36	Multiple Access: Random Access:	Lecture using PPT	e-resource	
37	ALOHA – CSMA - CSMA/CD.	Lecture using PPT	e-resource	
MODULE IV: CONNECTING DEVICES				
38	Hubs, Switches, Repeaters, Bridges,	Lecture		

	Routers and Gateway.	using PPT		
39	Network Layer: Host to Host delivery - Logical Addressing	Lecture using PPT		
40	Internet protocol: IPV4 and IPV6 – Address Mapping	Lecture using PPT		
41	Internet protocol: IPV4 and IPV6 – Address Mapping	Lecture using PPT	e-resource	
42	Internet protocol: IPV4 and IPV6 – Address Mapping	Lecture using PPT		
43	ICMP – IGMP – Unicasting, Multicasting and Broadcasting.	Lecture using PPT	e-resource	
44	Wired and Wireless LAN: Wireless WAN- Cellular Telephony and Satellite Networks.	Lecture using PPT		
45	Wired and Wireless LAN: Wireless WAN- Cellular Telephony and Satellite Networks.	Lecture using PPT		
46	Mobile Computing: Wireless networks: Wireless communication concepts; classification of wireless networks	Lecture using PPT	e-resource	
47	Cellular networks (1G, 2G, 3G, 4G), WLAN, WPAN, WMAN	Lecture using PPT		
48	Cellular networks (1G, 2G, 3G, 4G), WLAN, WPAN, WMAN	Lecture using PPT		
49	Satellite Networks, Mobile and Wireless Devices –Need for Mobile Computing	Lecture using PPT	Quiz	
50	Mobility management: Handoff and location management concepts.	Lecture using PPT		
51	Mobility management: Handoff and location management concepts.	Lecture using PPT		
52	**CIA II**			

MODULE V - TRANSPORT LAYER				
54	Transport Layer: UDP – TCP	Lecture using PPT	e-resource	
55	Application Layer: Name Space – Domain Name Space – Label	Lecture using PPT		
56	Domain Name- fully and partially qualified domain names.	Lecture using PPT	Tutorial	
57	Remote logging - Telnet, FTP, SMTP, and Voice over IP.	Lecture using PPT	e-resource	
58	Cryptography: Symmetric	Lecture using PPT		
59	Cryptography: Symmetric.	Lecture using PPT		
60	Cryptography: Symmetric.	Lecture using PPT		
61	Cryptography: Asymmetric.	Lecture using PPT		
62	Cryptography: Asymmetric.	Lecture using PPT	e-resource	
63	Cryptography: DES	Lecture using PPT		
64	Cryptography: Triple DES	Lecture using PPT	e-resource	
65	Cryptography: AES	Lecture using PPT		
66	Cloud Computing: cloud computing overview, definition and characteristics	Lecture using PPT		
67	Grid computing, difference between grid computing and cloud computing	Lecture using PPT	e-resource	

68	Advantages of cloud computing	Lecture using PPT		
69	Cloud deployment models/types (public, private, hybrid, and community clouds)	Lecture using PPT		
70	Cloud service models (IaaS, PaaS, SaaS, BPaas)	Lecture using PPT	e-resource	
71	Revision			
72	Revision			

INDIVIDUAL ASSIGNMENTS/SEMINAR – DETAILS & GUIDELINES

	Date of completion	**Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc.)**
1	24.06.2016	Data Communication, its characteristics, components, data representation, data flow, network criteria, Types of Connection and different topologies.
2	24.06.2016	Physical layer, Data link layer, Network layer, Transport layer, and Session layer of OSI model.
3	24.06.2016	Presentation layer and Application layer of OSI model, TCP/IP protocol and four levels of Addressing of TCP/IP.
4	24.06.2016	Analog signals, digital signals, Periodic and Non-periodic Signals, Sine Wave, Peak Amplitude, Period and Frequency, Phase, Wavelength, Bandwidth, Bit rate, and Bit length.
5	24.06.2016	Transmission impairment, Attenuation and Distortion and Noise.
6	24.06.2016	Multiplexing, Frequency Division Multiplexing, Wavelength Division Multiplexing, Time Division Multiplexing and Spread Spectrum.

7	24.06.2016	Transmission Media and Guided Media & Transmission Media and Unguided Media.
8	24.06.2016	Switching: Circuit Switching, Packet Switching, Datagram Networks and Virtual Circuit Networks
9	24.06.2016	Types of Errors – Redundancy – Detection versus Correction – Forward Error Correction versus Retransmission – Coding – Modular Arithmetic.
10	24.06.2016	Block Coding: Error Detection – Error Correction – Hamming Distance – Minimum Hamming Distance.
11	24.06.2016	Linear Block Codes: Some Linear Block Code. Cyclic Codes: Cyclic Redundancy Check – Checksum.
12	24.06.2016	Framing: Fixed-size framing, Variable-size framing, Character-oriented protocol and Bit-oriented protocol
13	24.06.2016	Flow control, Error control, Simplest protocol, Stop-and-Wait protocol.
14	24.06.2016	Noisy Channels: Stop-and-Wait Automatic Repeat Request, Go-back-N Automatic Repeat Request and Selective Repeat Automatic Repeat Request
15	24.06.2016	Multiple Access: Random Access, ALOHA, Slotted ALOHA, CSMA and CSMA/CD.
16	24.06.2016	Wired LAN, Wireless WAN, Cellular Telephony and Satellite Networks.
17	24.06.2016	Connecting Devices: Hubs, Switches, Repeaters, Bridges, Routers and Gateway.
18	24.06.2016	IPV4 and its packet format.
19	24.06.2016	Advantages of IPV6 than IPV4.
20	24.06.2016	ICMP, IGMP, Multicast Routing Protocols.
21	24.06.2016	Wireless WAN-Cellular Telephony and Satellite Networks
22	24.06.2016	Wireless networks: Wireless communication concepts; classification of wireless networks.

23	24.06.2016	Cellular networks (1G, 2G, 3G, 4G), WLAN, WPAN, WMAN, Satellite Networks
24	24.06.2016	Mobile and Wireless Devices –Need for Mobile Computing, Mobility management: Handoff and location management concepts,
25	24.06.2016	Transport Layer: UDP – TCP.
26	24.06.2016	Explain congestion control. Define Open loop.
27	24.06.2016	Explain congestion control. Define closed loop.
28	24.06.2016	Application Layer: Name Space – Domain Name Space – Label, Domain Name- fully and partially qualified domain names
29	24.06.2016	Remote logging - Telnet, FTP, SMTP, and Voice over IP.
30	24.06.2016	Cryptography, its components and its categories.
31	24.06.2016	All traditional cyphers.
32	24.06.2016	All simple modern cyphers.
33	24.06.2016	All modern round cyphers.
34	24.06.2016	Cloud Computing: cloud computing overview, definition and characteristics, grid computing, difference between grid computing and cloud computing, advantages of cloud computing
35	24.06.2016	Cloud service models/types (public, private, hybrid, and community clouds), cloud deployment models (IaaS, PaaS, SaaS, BPaas)

GROUP ASSIGNMENTS/ACTIVITES – DETAILS & GUIDELINES

	Date of completion	**Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc.)**
1	24.06.2016	Applications of IoT in Real Time Applications

REFERENCES

- Behrouz and Forouzan - Introduction to Data Communication and Networking - 4th Edition - TMH-2000
- Mobile ComputingTechnology, Applications, and Service Creation by Asoke K Talukder, RoopaYavagal – 1st Edition - McGraw-Hill - 2007
- Cloud Computing By Saurabh K, 2nd Edition - Wiley India Pvt. Ltd.-New Delhi,

WEB RESOURCE REFERENCES:

- https://www.tutorialspoint.com/computer_fundamentals/computer_networking.htm

COURSE PLAN 2 - 15U3CRCAP06: OBJECT ORIENTED PROGRAMMING IN C++

PROGRAMME	**BSC.COMPUTER APPLICATIONS**	**SEMESTER**	**2**
COURSE CODE AND TITLE	**15U3CRCAP06: OBJECT ORIENTED PROGRAMMING IN C++**	**CREDIT**	**3**
HOURS/WEEK	**4**	**HOURS/SEM**	**72**
FACULTY NAME	**JISHA SOMAN**		

COURSE OBJECTIVES

- To outline the essential features and elements of the C++ programming language.
- To explain programming fundamentals, including statement and control flow and recursion.
- To apply the concepts of class, method, constructor, data abstraction, function abstraction, inheritance, overloading, and polymorphism
- To understand the concept of streams
- To understand the concept of exception handling

SESSION	TOPIC	LEARNING RESOURCES	VALUE ADDITIONS	REMARKS
	MODULE I			
1	Introductory Session	PPT	video	
2	Basic concept of object oriented programming	PPT/Lecture		
3	benefits of oops	PPT/Lecture		
4	Structure of C++ Program	Lecture	e-resource	

5	Basic, derived and user defined data types	Lecture	e-resource	
6	Basic, derived and user defined data types	Lecture	e-resource	
7	Symbolic constants	Lecture	e-resource	
8	operators in C++	Lecture	e-resource	
9	Control Structures	Lecture	e-resource	
10	Control Structures	Lecture	e-resource	
11	Functions in C+	PPT/Lecture		
12	The main function, function prototyping	PPT/Lecture		
13	call by reference	PPT/Lecture		
14	return by reference	Lecture		
	MODULE II			
15	inline function	PPT/Lecture		
16	friend functions	Lecture		
17	specifying a class	Lecture		
18	Defining member functions	Lecture		
19	Nesting of member functions	Lecture		
20	Private member functions - arrays within a class	PPT/Lecture		
21	static data members	PPT/Lecture		
22	static member functions	PPT/Lecture		
23	Arrays of objects	PPT/Lecture		
24	objects as function arguments	Lecture		
25	Pass by value and pass by reference	Lecture		
CIA-1				

27	Nested Class	Lecture		
28	Constructors	Lecture		
29	Parameterized Constructors	PPT/Lecture		
30	Multiple constructors - Copy constructor	PPT/Lecture		
31	Dynamic constructor	PPT/Lecture		
32	Destructors			
	MODULE III			
33	Operator overloading	PPT/Lecture		
34	Unary Operator overloading	PPT/Lecture		
35	binary Operator overloading	PPT/Lecture		
36	Operator overloading with friend functions	Lecture		
37	Type conversions	Lecture	Q & Ans Session	
38	Inheritance: private, public, protected inheritance	PPT/Lecture		
39	Single inheritance	PPT/Lecture		
40	Multiple inheritance	PPT/Lecture		
41	Multilevel inheritance	PPT/Lecture		
42	Hierarchical inheritance	Lecture		
43	Hybrid inheritance	PPT/Lecture		
44	virtual base classes	PPT/Lecture		
45	Abstract classes	PPT/Lecture		
46	Constructors in derived classes	PPT/Lecture		
47	nesting of classes.	PPT/Lecture		
	MODULE IV			
48	Pointers	PPT/Lecture		

49	this pointer	PPT/Lecture		
50	Polymorphism	PPT/Lecture		
51	Pointers to objects	PPT/Lecture		
52	pointer to derived classes	PPT/Lecture	Video	
53	virtual functions	PPT/Lecture		
54	Pure virtual functions	PPT/Lecture		
55	C++ streams	Lecture		
56	Stream classes-Unformatted	Lecture	Debate	
57	console I/O operations	PPT/Lecture		
58	Managing output with manipulators	PPT/Lecture		
59	Manipulating strings	PPT/Lecture		
60	Stream classes-formatted	PPT/Lecture		
61	programs using manipulators	PPT/Lecture		
62	Revision	PPT/Lecture		
CIA - II				
MODULE V				
63	Exception Handling	Lecture	Demo video	
64	principle of Exception handling	Lecture		
65	Exception handling mechanism	Lecture	Group discussion	
66	try-catch	Lecture		
67	multiple catch	PPT/Lecture		
68	Nested try	PPT/Lecture		
69	Rethrowing the exception	PPT/Lecture		
70	Revision			

71	Revision			
72	Revision			

INDIVIDUAL ASSIGNMENTS/SEMINAR – Details & Guidelines

	Date of completion	Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)
1	10/08/2016	OOP concepts and basics of C++
2	8/08/2016	Program using Constructors

GROUP ASSIGNMENTS/ACTIVITES – Details & Guidelines

	Date of completion	Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)
1	18/09/2016	Programs using Inheritance

References

- James Rumbaugh, Michael Blaha -2007-Object Oriented Modeling and Design with UML Second Edition-Pearson Education
- E. Balaguruswamy - Object oriented Programming with C++ Fourth edition –McGraw Hill
- Yashwant Kanetkar – 2001 Let Us C++Second Edition - BPB Publications
- John R Hubbard -2004-Programming with C++ (Shaum's Outline series) Second Edition- McGraw Hill

Web resource references:

- https://www.tutorialspoint.com/cplusplus/index.htm
- https://www.javatpoint.com/cpp-tutorial

COURSE PLAN 3 - 15U3CRCAP7: SYSTEM ANALYSIS AND DESIGN

PROGRAMME	BSC COMPUTER APPLICATIONS	SEMESTER	3
COURSE CODE AND TITLE	15U3CRCAP7:SYSTEM ANALYSIS AND DESIGN	CREDITS	3
HOURS/WEEK	4	HOURS/SEM	72
FACULTY NAME	ACHAMMA CHERIAN		

COURSE OBJECTIVES

- To apply the software development life cycle model to a development project.
- To collect and analyse user requirements.
- To understand the principles of systems analysis and design\
- To able to carry out a structured analysis of business systems requirements
- To able to design business systems solutions.

SESSION	TOPIC	LEARNING RESOURCES	VALUE ADDITIONS	REMARKS
MODULE 1				
1.	Introduction			
2.	Syllabus discussion	Lecture		
3.	System and its concepts	PPT/Lecture		
4.	Elements of system	PPT/Lecture		
5.	Characteristics of system	PPT/Lecture		
6.	Information systems concepts	PPT/Lecture		

7.	Business information systems	PPT/Lecture		
8.	Describing the business organization	PPT/Lecture		
9.	organization chart , organization function list	PPT/Lecture		
10.	information system levels - operational, lower, middle, top management	PPT/Lecture		
11.	the system development life cycle concepts	PPT/Lecture		
12.	Hardware and software end products.	PPT/Lecture		
13.	Life cycle activities- life cycle flow chart, task	PPT/Lecture		
14.	Management review, baseline specifications	PPT/Lecture		
15.	Role of system analyst	PPT/Lecture		
MODULE 2				
16.	Basic tool of system analysis identification codes – definition, need for codes	Lecture		
17.	code plan, code dictionary	Lecture		
18.	common type of codes	Lecture		
19.	Notes Preparation			
20.	forms design	PPT/Lecture		
21.	basic parts of form	Lecture		
22.	style and types of form, principles of form design	PPT/Lecture		
23.	REVISION	PPT/Lecture		

24.	Tools for structure analysis and design: Types of basic charts	PPT/Lecture		
25.	decision tables	PPT/Lecture		
26.	decision trees	PPT/Lecture		
27.	structured English	PPT/Lecture		
28.	data flow diagram	Lecture		
29.	data flow diagram example	Lecture		
30.	data dictionary	PPT/Lecture		
31.	CIA I	PPT/Lecture		
32.	Discussion on CIA	PPT/Lecture		
33.	system flow charts	PPT/Lecture		
34.	flow charting symbols	PPT/Lecture		
35.	information oriented flow charts	PPT/Lecture		
36.	process oriented flow charts, HIPO	PPT/Lecture		
MODULE 3				
37.	Study phase: Study phase activities	PPT/Lecture		
38.	information service request	PPT/Lecture		
39.	initial investigation	PPT/Lecture		
40.	fact finding techniques	PPT/Lecture	Demo video	
41.	fact finding techniques	PPT/Lecture		
42.	fact analysis techniques	PPT/Lecture		
43.	fact analysis techniques	PPT/Lecture		
44.	steps in feasibility analysis	PPT/Lecture		
45.	steps in feasibility analysis	PPT/Lecture		
46.	study phase report	Lecture		

47.	Revision	Seminar		
48.	Revision	seminar		
MODULE 4				
49.	Design phase: Design phase activities	Lecture		
50.	structure design input design-input data	PPT/Lecture		
51.	input media and devices	PPT/Lecture		
52.	Output design	Lecture		
53.	design phase report	Lecture		
54.	Revision	Seminar		
55.	CIA II			
56.	Answer discussion	Lecture		
59	Development phase: Development phase activities	Seminar		
60	Bottom up approach	Seminar		
61.	Top down approach	Seminar		
62 - 63.	computer program development	Seminar		
MODULE 5				
64.	training- programmer, operator, user trainings	Lecture		
65.	convertion; change over plan, PERT	Lecture		
66.	steps in computer program development;	Lecture		
67	structured programming, *development phase report*	PPT/Lecture		
68	***SoftwareEngineering:*** *Introduction ,Role and Nature of Software,*	PPT/Lecture		

	Software Terminologies			
69	Role of Management in Software Development. Software Life Cycle Models – Build and Fix Model, Water Fall Model,	PPT/Lecture		
70.	Prototyping Model, RAD Model, Spiral Model, Iterative Enhancement Model,	PPT/Lecture		
71.	The Unified Process, Selection of a Life Cycle Model.	PPT/Lecture		
72.	Previous year question paper discussion			

INDIVIDUAL ASSIGNMENTS/SEMINAR – Details & Guidelines

Sl.No	**Date of completion**	**Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)**
1	15/7/16	SDLC Life Cycle

Books of study:

- Elements of System Analysis by Marvin Gore & John Stubbe, Galgotia Book Source
- Text book of software engineering by Kumudini Manwar & Manisha Kumbhar

References:

- System Analysis and Design by Elias M Awad, Galgotia Book Source
- Software Engineering Concepts by Richard Fairley, Tata McGraw Publication

COURSE 4 - 15U3CRCMT03: CALCULUS

PROGRAMME	**BSC COMPUTER APPLICATION**	**SEMESTER**	**3**
COURSE CODE AND TITLE	**15U3CRCMT03: CALCULUS**	**CREDIT**	**4**
HOURS/WEEK	**5**	**HOURS/SEM**	**90**
FACULTY NAME	**SIMI T A**		

COURSE OBJECTIVES

- To find the higher order derivative of the product of two functions and its applications
- To expand a function using Taylor's and Maclaurin's series.
- To conceive the concept of asymptotes and obtain their equations.
- To apply the concept of partial derivatives.
- To find the area under a given curve, length of an arc of a curve when the equations are given in parametric and polar form and find the area and volume by applying the techniques of double and triple integrals.
- To find the area and volume by applying the techniques of double and triple integrals

SESSION	TOPIC	LEARNING RESOURCES	VALUE ADDITIONS	REMARKS
MODULE 1				
1	Introduction	Lecture		
2	Successive Differentiation	Lecture& PPT		
3	Nth derivative	Lecture		
4	problems	discussion		
5	Leibnitz theorem	Lecture		

6	problems	discussion		
7	More problems	discussion		
8	Expansion of functions using Maclaurin's theorem	Lecture	Video	
9	problems	discussion		
10	Expansion of functions using Taylor's theorem	Lecture		
	problems	discussion		
11	Concavity	Lecture	Video	
12	problems	discussion		
13	points of inflexion	Lecture		
14	problems	discussion		
15	Curvature	Lecture		
16	problems	discussion		
17	Evolutes	Lecture		
18	Length of arc as a function derivatives of arc	Lecture		
19	problems	discussion		
20	Radius of curvature – Cartesian equations.	Lecture		
21	problems	discussion		
22	Centre of curvature	Lecture		
23	problems	discussion		
24	Evolutes	Lecture		
25	problems	discussion		

26	Involutes	Lecture		
27	problems	discussion		
28	properties of evolutes	Lecture		
29	problems	discussion		
30	Asymptotes	Lecture& PPT		
31	problems	discussion		
32	Envelopes	Lecture		
33	problems	discussion		
34	Extra problems	discussion		
35	Revision	Discussion		
MODULE 2				
36	Introduction	Lecture		
37	Partial derivatives	Lecture		
38	PROBLEMS	Discussion		
39	The chain rule	Lecture		
40	PROBLEMS	Discussion		
41	Chain rule for three independent variables	Lecture		
42	PROBLEMS	Discussion		
43	Extreme values	Lecture	Video	
44	PROBLEMS	Discussion		
45	saddle points	Lecture		
46	PROBLEMS	Discussion		
47	Lagrange multipliers	Lecture& PPT		
48	PROBLEMS	Discussion		

49	Legranges multipliers with two constraints	Lecture& PPT		
50	PROBLEMS	Discussion		
51	Partial derivatives with constrained variables	Lecture		
52	problems	Discussion		
53	Extra problems	Discussion		
54	Revision	Discussion		
55	Revision	Discussion		
56	**CIA -1**			
57	Answer discussion			
MODULE 2				
58	introduction	Lecture		
59	Substitution	Lecture		
60	problems	Discussion		
61	Area between curves	Lecture		
62	problems	Discussion		
63	Volumes by Slicing	Lecture& PPT	Video	
64	problems	Discussion		
65	rotation about an axis	Lecture		
66	Volume by disk method	Lecture&ppt		
67	problems	Discussion		
68	Volume by washer method	Lecture&ppt		
69	problems	Discussion		
70	Volumes by cylindrical shells	Lecture& PPT		

71	problems	Discussion		
72	Lengths of Plane Curves	Lecture		
73	problems	Discussion		
74	Areas of surfaces of Revolution	Lecture& PPT		
75	problems	Discussion		
76	The theorems of Pappus	Lecture		
77	Problems	Discussion		
78	Revision	Discussion		
MODULE 4				
79	Introduction	Discussion		
80	Double integrals	Lecture		
81	Areas	Lecture& PPT		
82	**CIA-2**			
83	Double integrals in polar form	Lecture		
84	problems	Discussion		
85	Triple integrals in rectangular coordinates	Lecture& PPT	Video	
86	problems	Discussion		
87	Triple integrals in cylindrical and spherical coordinates	Lecture& PPT	Video	
88	problems	Discussion		
89	Substitutions in multiple integrals	Lecture& PPT		
90	Revision	Discussion		

INDIVIDUAL ASSIGNMENTS/SEMINAR – Details & Guidelines

	Date of completion	**Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc.)**
1	15/7/2016	Problems on Centre of curvature, Evolutes and Involutes, Asymptotes and Envelopes.
2	5/8/2016	Problems on extreme values ,saddle points and Lagrange multipliers
3	30/8/2016	Problems on volumes by Slicing and rotation about an axis and volumes by cylindrical shells
4	15/9/2016	Problems on Triple integrals in cylindrical and spherical coordinates and substitutions in multiple integrals.

TEXT BOOKS & REFERNCES

- George B. Thomas Jr. (Eleventh Edition) – Thomas' Calculus, Pearson, 2008.
- Shanti Narayan and P. K. Mittal– Differential Calculus (S. Chand & Co.) 2008

COURSE 5- 15U3CPA03: PROBABILITY DISTRIBUTIONS

PROGRAMME	BACHELOR OF COMPUTER APPLICATIONS	SEMESTER	3
COURSE CODE AND TITLE	15U3CPA03 :PROBABILITY DISTRIBUTIONS	CREDIT	4
HOURS/WEEK	5	HOURS/SEM	90
FACULTY NAME	MS. RESHMI A. N		

COURSE OBJECTIVES

- To understand and apply mathematical expectations-moments,moment generating functions
- To understand conditional expectation ,Cauchy Schwartz inequality
- To understand the concepts of probability distributions and their properties
- To understand -Normal, Standard normal and Lognormal distributions
- To understand lack of memory property, Normal distributions
- To understand Tchedycheff's inequality,Bernoulli's law of large numbers
- To know methods of sampling
- To understand sampling distributions, standard error

SESSION	TOPIC	LEARNING RESOURCES	VALUE ADDITIONS	REMARKS
1	Bridge course	Lecture		
2	Introduction to mathematical expectation	Lecture	e-resource	
3	Mathematical Expectation-, and its properties,	Lecture		

4	Moment generating functions(m.g.f.)	PPT/Lecture		
5	Properties of Moment generating functions(m.g.f.)	PPT/Lecture		
6	Characteristic function	PPT/Lecture		
7	Conditional expectation	Lecture		
8	Cauchy Schwartz inequality	PPT/Lecture		
9	Bivariate moments,	PPT/Lecture		
10	Correlation between two random variables	Lecture		
11	Class test	Lecture		
12	Introduction to probability	Lecture		
13	Uniform distribution (Discrete)	PPT/Lecture		
14	Bernoulli Distribution	Lecture		
15	Example problems on Bernoulli distribution	PPT/Lecture		
16	Geometric distribution	Lecture		
17	Properties of Geometric distribution	Lecture		
18	Exponential distribution	Lecture		
19	characteristics	Lecture		
20	problems	Lecture		
21	Gamma distribution	PPT/Lecture		
22	Properties	PPT/Lecture		
23	problems	Lecture		
24	CIA I			
25	Beta distribution	Lecture		
26	Extra problems	PPT/Lecture		

27	Binomial distribution	PPT/Lecture		
28	Poisson distribution	PPT/Lecture		
29	Lack of memory property(LMP	Lecture	Quiz	
30	fitting of binomial distributions	PPT/Lecture		
31	Fitting problems	PPT/Lecture		
32	Fitting of Poission Distribution	PPT/Lecture		
33	Fitting problems	PPT/Lecture		
34	Normal distribution	Lecture		
35	properties	Lecture		
36	Mean , median, mode of normal	PPT/Lecture		
37	Moment generating function of normal distribution	PPT/Lecture		
38	Standard normal distribution	PPT/Lecture		
39	Fitting of Normal distribution	PPT/Lecture		
40	problems	Lecture		
41	problems	Lecture		
42	Class test			
43	Tchebycheff's inequality	PPT/Lecture		
44	Bernoulli's law of large numbers,	Lecture		
45	Weak law of large numbers	Lecture		
46	Central limit theorem (Lindberg Levy form with proof)	Lecture		
47	Limiting distributions of binomial and Poisson distributions	Lecture		
48	Methods of sampling – Simple random sampling	Lecture		
49	systematic sampling and stratified	Lecture		

	sampling			
50	Statistic and Parameter	Lecture		
51	problems	Lecture		
52	CIA II			
53	Sampling distributions, standard error	Lecture		
54	Sampling distribution of mean and Variance	Lecture		
55	Chi-square	Lecture		
56	Properties and problems	Lecture		
57	Student's t distribution	Lecture		
58	properties	Lecture		
59	F distribution	Lecture		
60	properties	Lecture		
61	Interrelations	Lecture		
62	problems	Lecture		
63	Revision	Lecture		
64	Question paper discussion	Lecture		
65	Test paper	Lecture		
66 – 78	Seminar and presentations			
79 – 90	Revision			

INDIVIDUAL ASSIGNMENTS/SEMINAR – Details & Guidelines

	Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)
1	Problems ON CORRELATION COEFFICIENT
2	Problems using PROBABILITY AND BAYES THEOREM

REFERENCES:

1. S.P.GUPTA - STATISTICAL METHODS
2. S.C.GUPTA , V.K.KAPOOR - FUNDAMENTALS OF MATHEMATICAL STATISTICS
3. B.L.AGARWAL - BASIC STATISTICS