SACRED HEART COLLEGE (AUTONOMOUS)

Department of Computer Science

BSc Computer Applications

Course plan

Academic Year 2018 - 19

Semester VI

COURSE STRUCTURE

Course Code	Title of The Course	No. Hrs./Week	Credits	Total Hrs./Sem
15U6CRCAP12	Operating Systems	5	4	72
15U6CRCAP13	Cyber Security	5	4	72
15U6PRCAP6	Project	5	4	90
15U6CRCMT7	Real Analysis	5	4	90
15U6CRCST7	Computer Aided Data Analysis using Excel and R	5	4	90

COURSE PLAN 1-15U6CRCAP11: OPERATING SYSTEM

PROGRAMME	**BACHELOR OF COMPUTER APPLICATIONS**	**SEMESTER**	**6**
COURSE CODE AND TITLE	**15U6CRCAP12: OPERATING SYSTEM**	**CREDIT**	**4**
HOURS/WEEK	**5**	**HOURS/SEM**	**72**
FACULTY NAME	**NIJO ANTONY**		

COURSE OBJECTIVES

- To Identify mechanism to handle processes, memory, I/O devices, and files and develop an appropriate algorithm for it.
- To Understand issues of Process Management including process structure, synchronization, scheduling and communication.
- To Interpret the reasons for deadlock state, and the solution methods to handle it
- To Differentiate type of memory management techniques used by Operating Systems
- To Appreciate the need of access control and protection in an operating system

SESSION	TOPIC	LEARNING RESOURCES	VALUE ADDITIONS	REMARKS
MODULE I				
1	Introduction about operating system, definition	PPT/Lecture	video	
2	Different functions of OS	PPT/Lecture		
3	Types of Operating system	PPT/Lecture		
4	Types of Operating system	PPT/Lecture		

5	Operating system operations	PPT/Lecture		
6	Operating system operations	PPT/Lecture		
7	Different services of operating system	PPT/Lecture		
8	Different services of operating system	PPT/Lecture		
9	operating system interfaces and modes of opeations	PPT/Lecture		
10	System calls	PPT/Lecture		
12	Basic concepts of Process	PPT/Lecture		
13	Process Scheduling	PPT/Lecture		
14	Process Scheduling	PPT/Lecture		
15	Process Scheduling			
MODULE II				
16	operations on processes	PPT/Lecture		
17	Inter posster communication and RPC	Lecture		
18	Test Runner	Lecture		
19	Different types of Threads	Lecture		
20	Different types of Threads	Lecture		
21	Different types of Threads	PPT/Lecture		
22	Different types of Threads	PPT/Lecture		

23	Different types of Threads	PPT/Lecture		
24	Process Scheduling	PPT/Lecture		
25	Scheduling criteria	Lecture		
26	Scheduling criteria	Lecture		
CIA-1				
27	Process Scheduling algorithms	Lecture		
28	Process Scheduling algorithms	Lecture		
29	Process Scheduling algorithms	PPT/Lecture		
30	Process Scheduling algorithms	PPT/Lecture		
31	Multiple Process scheduling	PPT/Lecture	Quiz	
32	Multiple Process scheduling			
MODULE III				
33	Process Coordination	PPT/Lecture		
34	Synchronization	PPT/Lecture		
35	The Critical Section problem	PPT/Lecture		
36	The Critical Section problem	Lecture		
37	Synchronization Hardware	Lecture	Q & Ans Session	
38	Semaphores	PPT/Lecture		

39	Monitors	PPT/Lecture		
40	Dead Locks : xSystem Model	PPT/Lecture		
41	Dead Lock Characterization	PPT/Lecture		
42	Dead Lock Characterization	Lecture		
43	Methods of Handling Dead Locks	Lecture		
44	Dead Lock Prevention	PPT/Lecture		
45	Dead Lock Prevention	PPT/Lecture		
46	Dead Lock Prevention	PPT/Lecture		
47	Dead Lock Avoidance	PPT/Lecture		
48	Dead Lock Detection	PPT/Lecture		
49	Recovery from Dead Lock.	PPT/Lecture		
50	Memory Management Strategies	PPT/Lecture		
51	Swapping	PPT/Lecture		
52	Contiguous memory allocation	PPT/Lecture		
53	Contiguous memory allocation	PPT/Lecture		
54	Paging	PPT/Lecture		
55	Segmentation	PPT/Lecture		
56	Segmentation	PPT/Lecture		
57	Virtual Memory Management	PPT/Lecture		

58	Virtual Memory Management	PPT/Lecture		
59	Demand paging	PPT/Lecture		
60	Demand paging	PPT/Lecture		
61	Page Replacement	PPT/Lecture		
62	Page Replacement	PPT/Lecture		
CIA - II				
63	File System	PPT/Lecture		
64	File Concept	PPT/Lecture		
65	Access Methods	PPT/Lecture		
66	Directory Structure	PPT/Lecture		
67	protection	PPT/Lecture	video	
68	Implementing File Systems	PPT/Lecture		
69	File System Structure	PPT/Lecture		
70	File System Structure	PPT/Lecture		
71	Allocation Methods	PPT/Lecture		
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	19,20,21,22/2/2019	Different open source operating systems
2	19,20,21,22/2/2/2019	Different Functions of operating systems

GROUP ASSIGNMENTS/ACTIVITES – Details & Guidelines

	Date of completion	Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)
1	23/1/2019	Deadlocks

References

e-References - Fundamentals of testing(2016) 1st edi ISTQB Foundation level certificate;

http"//istqbexamcertifiaction.com

sommerville,I, (2000) Software engineering, Harlow, England: Addison - wesley

Web resource references:

- https://en.wikipedia.org/wiki/Operating_system

COURSE 2- 15U6CRCAP13: CYBER SECURITY

PROGRAMME	**BSc CA**	**SEMESTER**	**6**
COURSE CODE AND TITLE	**15U6CRCAP13: CYBER SECURITY**	**CREDIT**	**4**
HOURS/WEEK	**5**	**HOURS/SEM**	**72**
FACULTY NAME	**RENSI K RANJITH & FR.NIJO**		

COURSE OBJECTIVES

- To understand the concepts of Ecommerce.
- To analyse and assess the impact of cybercrime on government, businesses, individuals and society.
- To evaluate standards and good practices for digital evidence and digital forensics
- To understand various laws related to cyber crimes
- To understand intellectual property rights

SESSION	TOPIC	LEARNING RESOURCES	VALUE ADDITIONS	REMARKS
MODULE I				
1	Syllabus discussion and Defining E-commerce	PPT		
2	E-Commerce business models and concepts	PPT/Lecture		
3	E-Commerce business models and concepts	PPT/Lecture		
4	E-Commerce business models and concepts	PPT/Lecture	video	
5	E-Commerce Infrastructure	PPT/Lecture		
6	E-Commerce Infrastructure	PPT/Lecture		
7	E-Commerce Development	Lecture		
8	E-Commerce Development	Lecture		
9	Security Issues	Lecture		
10	Security Issues	Lecture		
11	Revision			
MODULE II				
12	**Cyber Crime:** Definition	Lecture		
13	Types and forms of Cyber Crimes	Lecture	video	
14	Types and forms of Cyber Crimes	Lecture		
15	Types and forms of Cyber Crimes	Lecture		
16	Computer Viruses	Lecture		
17	Computer Trojans, Computer Worms	Lecture		
18	Web Hacking.	Lecture		
19	Foot printing, Port Scanning	Lecture		
20	Foot printing, Port Scanning	Lecture		

21	E-Shoplifting Web Defacement	Lecture		
22	Denial of Service Attacks	Lecture		
23	CIA-1			
24	Denial of Service Attacks	Lecture		
25	Manipulating Cookies	Lecture		
26	Email Hacking	Lecture	Quiz	
27	Email Hacking using Packet Sniffers	Lecture		
28	Phishing	Lecture		
29	Email Frauds	Lecture		
30	Email Bombing Email Hijacking	Lecture		
31	Social Engineering	Lecture		
32	revision			
MODULE III				
33	Best Practices for Cyber Crime Investigation	Lecture		
34	Initialising a Search and Seizure Operation Tracking	Lecture		
35	Tracing Emails	Lecture		
36	Recovery of Digital Evidence	Lecture	video	
37	Recovery of Digital Evidence	Lecture		
38	Setting up a Cyber Crime Investigation Cell	Lecture		
39	Cyber Forensics	Lecture		
40	Cyber Forensics	Lecture		
41	Forensic Principles	Lecture		
42	Forensic Principles	Lecture		
43	Forensic Imaging & Verification,	Lecture		

44	Forensic Imaging & Verification,	Lecture		
45	Data Recovery and Analysis.	Lecture		
Module IV				
46	Cyber Law	Lecture	video	
47	Cyber Law	Lecture		
48	Cyber terrorism Prevention	Lecture		
49	detection of Cyber Crime	Lecture		
50	Cyber Policing Current statutes in India	Lecture		
51	Penalties & Offences under the Information Technology Act, 2000	PPT/Lecture		
52	Penalties & Offences under the Information Technology Act, 2000	PPT/Lecture		
53	Penalties & Offences under the Information Technology Act, 2000	PPT/Lecture	video	
54	Offences under the Indian Penal Code, 1860	PPT/Lecture		
55	Offences under the Indian Penal Code, 1860			
56	Issues relating to investigation and adjudication of Cyber Crimes in India	Lecture		
57	Issues relating to investigation and adjudication of Cyber Crimes in India	PPT/Lecture		
58	Digital evidence IT act 2000 & and other legal provisions	PPT/Lecture		
59	Revision	PPT/Lecture		
CIA - II				
Module V				
60	Intellectual Property Issues and Cyberspace	Lecture		

61	Intellectual Property Issues and Cyberspace	Lecture		
62	Overview of Intellectual Property related Legislation in India	Lecture		
63	Copyright law & Cyberspace	Lecture		
64	Copyright law & Cyberspace	PPT/Lecture		
65	Trademark law & Cyberspace	PPT/Lecture		
66	Digital Delivery of Intellectual Property Services	Lecture	video	
67	infringement	PPT/Lecture		
68	Patent	PPT/Lecture		
69	Different types of patent	PPT/Lecture		
70	Trade Secrets	PPT/Lecture		
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	28/11/2018	Ecommerce Marketing Issues
2	13/2/2019	Cyber Law Case studies

GROUP ASSIGNMENTS/ACTIVITES – Details & Guidelines

	Date of completion	**Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)**
1	14/1/2019	Cybercrimes(Group Discussion

REFERENCES

- Computers, Internet and New Technology Laws (A comprehensive reference work with special focus on developments in India) by Karnika Seth
- Cyber Law by Chris Reed
- "The Internet", Douglas E. Comer, Prentice –Hall of India, Third Edition.
- "Cyber Law Crimes", Barkha and U. Rama Mohan, Asia Law House, New Edition.

COURSE 3- 15U5CRCMT07: REAL ANALYSIS

PROGRAMME	**BSC COMPUTER APPLICATION**	**SEMESTER**	**6**
COURSE CODE AND TITLE	**15U6CRCMT07 REAL ANALYSIS**	**CREDIT**	**4**
HOURS/WEEK	**5**	**HOURS/SEM**	**90**
FACULTY NAME	**SIMI T A**		

COURSE OBJECTIVES

- **To test the convergence of series**
- **To Familiarise theorems on continuity.**
- **To Compute definite integrals by using Riemann Sum**
- **To Test uniform convergence of Series .**

SESSION	TOPIC	LEARNING RESOURCES	VALUE ADDITIONS	REMARKS
MODULE 1				
1	Introductory Session	Discussion		
2	A necessary condition for convergence	Lecture		
3	Cauchy`s general principle of onvergence for a series	Lecture		
4	Positive term series	Lecture		
5	A necessary condition for convergence of positive term series	Lecture		
6	Geometric series	Lecture	video	
7	The comparison series $\sum\frac{1}{hP}$ comparison test for positive term series without proof	Lecture		
8	Problems	Lecture		
9	Cauchy`s root test	Lecture		
10	Problems	Discussion		
11	DALEMBERTÈS RATIO test	Lecture	video	
12	Problems	Discussion		
13	Raabe’s test	Lecture		
14	Problems	Lecture		
15	Gauss`s test	Lecture		
16	Problems	Lecture		
17	Absolute convergence	Lecture		

18	Theorem	Lecture		
19	Series with arbitrary terms	Lecture		
20	Alternating series	Lecture	video	
21	Leibnitz's Test	Lecture		
22	Problems	Discussion		
MODULE-2				
23	Continuous function	Lecture		
24	Problems	Lecture		
25	Continuity at a point	discussion		
26	Continuity in an interval	Lecture		
27	Problems	Discussion		
28	Discontinuous functions	Lecture		
29	**CIA – I**			
30	Answer discussion	Discussion		
31	Theorems on continuity	Lecture		
32	Theorems	Lecture		
33	Theorems	Lecture		
34	Functions continuous on closed intervals	Lecture		
35	Theorems	Lecture		
36	Theorems	Lecture	video	
37	Theorems	Lecture		
38	Theorems	Lecture		
39	Theorems	discussion		
40	Theorems	Lecture		

41	Theorems	discussion		
42	Uniform continuity	Lecture		
43	Theorems	Lecture		
44	Theorems	discussion		
45	Theorems	Lecture		
MODULE 3				
46	Definitions and existence of the integral	Lecture		
47	Problems	discussion		
48	Problems	Lecture		
49	Inequalities of integrals	discussion		
50	Problems	discussion		
51	Problems	Lecture		
52	Refinement of partitions of integrability	Lecture	video	
53	Theorems	Lecture		
54	Theorems	Lecture		
55	Theorems	Lecture		
56	Integrability of the sum of integrable functions	discussion		
57	Theorems	Lecture		
58	Theorems	Lecture		
59	Theorems	Lecture		
60	Theorems	Lecture		
61	The integrals as the limit of a sum	Discussion		

62	Theorems	Lecture		
63	Some applications	discussion		
64	Problems	discussion		
65	Some integrable functions	Lecture	video	
66	Theorems	Lecture		
67	Theorems	Lecture		
68	Integration and differentiation	Lecture		
69	Theorems	Lecture		
70	Problems	Discussion		
71	The fundamental theorem of calculus	Lecture		
72	Problems	discussion		
73	Problems	discussion		
74	**CIA II**			
75	Answer discussion	discussion		
76	Problems	discussion		
MODULE 4				
77	Point wise convergence	Lecture		
78	Problems	Lecture		
79	Uniform convergence on an interval	Lecture		
80	Theorems	Lecture		
81	Cauchy`s criterion for uniform convergence	Lecture		
82	Theorems	Lecture		

83	A test for uniform convergence of sequences	Lecture		
84	Problems	Discussion		
85	Test for uniform convergence of series	Lecture	video	
86	Problems	discussion		
87	Weierstrass`s M-test	Discussion		
88	Problems	discussion		
89	Abel`s test	Lecture		
90	Theorems	Lecture		
91	Statement of Dirichelet`s test without proof	Lecture		

INDIVIDUAL ASSIGNMENTS/SEMINAR – Details & Guidelines

	Date of completion	**Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)**
1	20/12/2018	Problems on Cauchy`s root test, DALEMBERTÈS RATIO test, Raabe's test etc.
2	1/2/2019	Problems from previous year question papers

TEXT BOOKS & REFERNCES

S.C.Malik and Savitha Arora - Mathematical Analysis, 2nd Edition.

COURSE 4- 15U6CRSTA07

COMPUTER AIDED DATA ANALYSIS USING EXCEL AND R SOFTWARE

PROGRAMME	**BACHELOR OF COMPUTER APPLICATIONS**	**SEMESTER**	**6**
COURSE CODE AND TITLE	**15U6CRSTA07 COMPUTER AIDED DATA ANALYSIS USING EXCEL AND R SOFTWARE**	**CREDIT**	**4**
HOURS/WEEK	**5**	**HOURS/SEM**	**90**
FACULTY NAME	**MS. RESHMI A.N AND ACHAMMA CHERIAN**		

COURSE OBJECTIVES

- To apply elementary statistical analysis and testing using Excel
- To apply correlation and regression analysis using Excel
- To explain Basics in R programming
- To apply statistical analysis using R

SESSION	TOPIC	LEARNING RESOURCES	VALUE ADDITIONS	REMARKS
1	Introduction	lecture		
2	Syllabus Discussion	PPT	video	
3	Features of Excel	PPT/Lecture		
4	Familiarization of Menus, Formatting cells	PPT/Lecture		
5	Developing Spreadsheets	Lecture		

6	working with formulae	Lecture		
7	Diagrams and graphs	Lecture		
8	Preparation of marklist & Payroll	PPT/Lecture	e-resource	
9	Measures of Central tendency - arithmetic mean Geometric mean,	PPT/Lecture		
10	median, mode (for discrete and continuous data)	Lecture		
11	Geometric mean (for discrete and continuous data)	Lecture	video	
12	harmonic mean (for discrete and continuous data)	Lecture		
13	Measure of Dispersion – Range, Standard Deviation, Mean Deviation	PPT/Lecture	video	
14	Standard Deviation	Lecture		
15	Problems on Standard Deviation	Lecture		
16	Problems on Standard Deviation	Lecture		
17	Mean Deviation	Lecture		
18	Problems on Mean Deviation	Lecture		
19	Problems on Mean Deviation	Lecture		
20	Introduction to R with history of development of R.	PPT/Lecture	video	
21	Introduction to R with history of development of R.	Lecture		
22	R console,	practical		

23	Functions and terms in R	PPT/Lecture		
24	Getting data into R. Input data from keyboard using c ( )	PPT/Lecture	video	
25	Getting data into R. , scan ( ) functions.	practical		
26	Unit Revision	Lecture		
27	Revision	Lecture		
28	Statistical Test concerning means	Lecture		
29	One sample Z Test for mean	Lecture		
30	Problems on One sample Z Test for mean	Lecture	video	
31	Problems on One sample Z Test for mean	Lecture		
32	One sample t-Test for mean	Lecture		
33	Problems on One sample t-Test for mean	Lecture		
34	Two sample z test for means,	Lecture		
35	Problems on Two sample z test for means,	Lecture		
36	Problems on Two sample z test for means,	Lecture		
37	two sample t-Test for means	Lecture		
38	Problems on two sample t-Test for means	Lecture		
39	Paired t-Test	Lecture		
40	Problems on Paired t-Test	Practical		

40	chi-square test	Lecture		
42	Problems on chi-square test	Lecture		
43	ANOVA	PPT/Lecture		
44	F-Test for variance,	Lecture		
45	Correlation analysis- Scatter diagram method	PPT/Lecture		
46	Karl Pearson Correlation co-efficient	Lecture		
47	Problems on Karl Pearson Correlation co-efficient	Lecture		
48	Scattered diagram method	Lecture	Q & A Session	
49	Regression Analysis –	Lecture		
50	Regression Analysis –	Lecture		
51	Regression Lines,	Lecture		
52	problems	Lecture		
53	Fitting of trend line	Lecture		
54	problems	Lecture	Quiz	
55	problems	Lecture		
56	Unit Revision			
57	Revision			
58	CIA- 1	PPT/Lecture		
59	Introduction to R	Lecture		
60	R console	Lecture		
61	R symbols	Lecture		
62	functions and terms.	Lecture		

63	Communicating with R using different ways using word processor. ..	Lecture		
64	Communicating with R using different ways using word processor. ..	Lecture		
65	Communicating with R using excel,	Lecture		
66	Communicating with R using SPSS	practical	video	
67	Getting data into R	practical		
68	Input data from keyboard using c(),			
69	Input data from keyboard using scan() functions	Lecture		
70	Handling of large data using R, ,	Lecture		
71	Combining vectors into a rectangular matrix,	Lecture		
72	use of rbind()	Lecture		
73	cbind() functions	Lecture		
74	R Cheat sheet – Basics, t and export data,data frames, input, numerical functions,Programming, Operators.	PPT/Lecture		
75	Measures of Central tendency - arithmetic mean,, Geometric mean,	PPT/Lecture		
76	median,			
77	Problems on median,			

78	mode			
79	Problems on mode			
80	Measure of Dispersion – Range,			
81	Standard Deviation,			
82	Mean Deviation (for discrete and continuous data) using R			
83	PROBLEMS			
84	CIA -2	PPT/Lecture		
85	Reading from ASCII text file-read table() function, file.choose() function.	PPT/Lecture		
86	List of data created by other Statistical packages	Lecture		
87	Data frames, colname() function	Lecture		
88	R workspace, attach() function	Lecture		
89	Unit Revision	Lecture		
90	Revision	class test		

ASSIGNMENTS

	DATEOF ASSIGNMENTS	Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)
1	12/11/2018	Problems from Variance, correlation coefficient, regression,
2	27/1/2019	Problems from Measures of Central tendency - arithmetic mean, median, mode, Geometric mean, harmonic mean Measure of Dispersion – Range, Standard Deviation, Mean Deviation

REFERENCES:

1. Stephen L Nelson and Juila Kelly (2001) . The complete reference office XP, Tata McGraw-Hill
2. Sarma KVS (2001), Statistics Made Simple Do it Yourself on PC, Prentice Hall of India.
3. The R book (2007) Michael J Crawley
4. Statistics and introduction using R (2005) Michael J..Crawley
5. Handbook of Statistical analysis using R (2006) Brain S. Everitt and Torsten Horthorn.