KSKV Kachchh University
Program: BCA
Semester: V
Syllabus with effect from June 2018

Course Type	Course Code	Name of the Course	T/P	Credit	Exam Duration In Hrs	Components Of Marks		
						Internal	External	Total
Core Courses	CCCS-519	Object Oriented Programming with Java	T	4	2:15	40	60	100
	CCCS-520	Data Communication and Networks	T	4	2:15	40	60	100
	CCCS-521	Practical based on CCCS-519	P	4	2:15	40	60	100
	CCCS-522	Practical based on CCCS-520 and CECS509 OR CECS510	P	4	2:15	40	60	100
Foundation Courses	FCCS-506	Computer Based Optimization Models	T	4	2:15	40	60	100
Elective Courses (Any One)	CECS-509	Cybercrime and Cyber security	T	2	2:15	40	60	100
	CECS-510	Operating Systems	T	2	2:15	40	60	100
Total				24		240	360	600

KSKV Kachchh University
Program: BCA
Semester: V

Paper Code: CCCS-519	Total Credit : 2
Title of Paper: Object Oriented Programming with Java	Total Marks : 60
	Time : 2:15 Hrs

Unit	Description	Weighting
I	Introduction to OOP, Features and Evolution of JAVA, Byte code and JVM, Applications, Applets, Classes, Objects, Encapsulation, Garbage Collection, C++ v/s. JAVA, Data types, Variables, Operators, Associatively and Precedence, Expressions, Type Conversion, Comments, Arrays, Keywords, Methods, Arguments and Return Values, Static v/s. Instance Members, Command-Line Arguments, Escape sequences. Control Structures (if, switch...case), Loops(for, while, do...while), Constructors.	25%
II	Access Specifiers, Subclasses, Inheritance, Method Overriding, Interfaces and Packages, Access Control and Packages, Exception Handling, Custom Exceptions.	25%
III	Java Class Libraries, The Integer Class, Random Class, Date Class, Calendar and Gregorian Calendar Classes, Vector Class and Enumeration Interface, Stack Class, Hashtable Class, StringTokenizer Class, Files and Directories, Character Streams, Buffered Character Streams, The PrintWriter Class, Byte Streams, Random Access Files, The StreamTokenizer Class Networking Internet Addresses, ServerSockets and Sockets, Diagram Sockets and Packets, Uniform Resource Locators	25%
IV	Introduction to visual programming in JAVA with AWT and Swing. GUI Components. Event Handling, Applets and the Life Cycle. The Applet Class, The Graphics Class, Colors, Text, Applet Dimensions Database Drivers, jdbc-odbc bridge, connection, Performing the Basis SQL commands	25%

Basic Text & Reference Books :-	
1.	Balagurusamy, Programming with Java: A printer-Second Edition, Tata McGraw-Hill,2000
2.	Naughton & Schildt, JAVA: The Complete Reference, Tata McGraw Hill.

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Paper Code: CCCS-519	Total Credit : 2
Title of Paper: Object Oriented Programming with Java	Total Marks : 60 Time : 2:15 Hrs

Unit	Description		Total Marks
I,II,III,IV	Q.1(A) Multiple Choice Questions (MCQ)	07	15
	Q.1 (B) Short Questions (Definitions, Blanks, Full Forms, True/False, Match the Following)	08	
I,II	Q.2(A) Medium Questions (Any Two)	06	15
	Q.2(B) Medium Questions / Long Questions (Any Three)	09	
III,IV	Q.3(A) Medium Questions / Long Questions (Any Two)	06	15
	Q.3(B) Medium Questions / Long Questions (Any Two)	08	
I,II,III,IV	Q.4 Programs based on Java (Any Two)	15	15

KSKV Kachchh University
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Paper Code: CCCS-520	Total Credit : 2
Title of Paper: Data Communication and Networks	Total Marks : 60
	Time : 2:15 Hrs

Unit	Description	Weighting
I	Introduction- The telephone system, Standards organizations, History and Applications of data communications; Fundamentals of data communications- Signal representation, digital and analog signals, modems, data codes, Unicode, telecommunications and voice communications.	25%
II	Conducted media-Twisted pair, coaxial and fiber-optic cable, Radiated media- broadcast radio, microwave, cellular radio, SS radio, Media selection- cost, speed, errors and security, Computers and terminals, Network configurations, Terminal interfaces; Multiplexers- FDM, TDM, STDM, WDM, FDMA, TDMA, CDMA, multiplexer configurations, Concentrators, Front-end processors, Controllers, Protocol converters, Ancillary equipment	25%
III	Analog modulation- AM, FM, PM, QAM, Digital modulation-digital to analog, analog to digital and digital to digital modulation, Transmission directions-simplex, half-duplex, full-duplex, Modes- serial, parallel, Synchronization- asynchronous, synchronous, Errors- detection, correction, prevention, Data Transmission- ISDN, DSL, LMDS Protocols –OSI, Wide Area Network protocols, Internet protocols, Local Area Network protocols, Wireless protocols.	25%
IV	Switched circuits- DEMARC, LEC, VPN, ISDN, Dedicated circuits- voice grade, wideband, T-carrier, DSL, SONET, Fast packet services- X.25, Frame relay, ATM, SMDS, AIN, MPLS. Physical security, Software security, Digital signatures, Security issues.	25%

Basic Text & Reference Books :-	
1.	Business Data Communications: Shelly / Cashman / Serwatka (Thomson Publishers)
2.	Data Communication and Networking : Dr. M. Jain, Satish Jain (BPB)
3.	Data Communication and Computer Networks : Brijendra Singh (PHI)

KSKV Kachchh University
Program: BCA
Semester: V

Paper Code: CCCS-521	Total Credit : 4
Title of Paper: Practical based on CCCS-519	Total Marks : 60
	Time : 2:15 Hrs

1. Write a Simple Application to print any trigonometric / mathematical formula.
2. Find the greatest of numbers.
3. Write a program to display a table in the format n x i = m
4. Create a program using switch case statement to identify the day of the week.
5. Write a program to find greatest and smallest element of an array.
6. Write a program to sort the array using bubble sort.
7. Write a program to accept string as a command line argument and display the string in reverse order.
8. Write a small program that accepts an argument from the user and cheeks it for the palindrome.
9. Write a program to check the format of email address given by the user as command line argument.
10. Create a class, which has a method to calculate the area of a triangle and use it.
11. Create a class with two methods for calculating area and parameter of triangle. Create another class and initialize the instance of the former class and calculate the area and perimeter.
12. Create a class with a method, which accept an object of the same class as a parameter and calculates the addition of two matrices.
13. Create a class quadrilateral and create two methods each for calculating area and perimeter of the quadrilateral with one and two parameters respectively.
14. Create a class with a constructor, which initializes all the class level variable and display the values of the variables.
15. Create a base class called vehicle which contains properties called color, wheels. Create a child class car and which has properties called model no and make. Use the object of the child class which will define the different properties of a car.
16. Create a method to calculate the area and perimeter of a circle. Extend the semicircle class child of circle class and override the method to calculate the area and perimeter of a semicircle (if possible use this and super keywords)
17. Create a class, which has two methods each of static and non-static nature. Try to use them in any class of your choice and enlist the different interfaces and packages.
18. Create an interface called arithmetic, which defines methods for sum, multiplication, division, subtraction, percentage and implement of them.
19. Create a package, which holds the class and an interface defined in the previous question and use them in your main method/class.
20. Create an abstract class and try to use if. Enlist the problems that come. Create an abstract class inherit it and implement the methods of the abstract class, e.g. People – Student.
21. Create an inner class shape which has a method called pyramids to create a pyramid scheme. Use this method in the outer class.
22. Write a program to handle an exception using try and catch block (Zero division problem)
23. Define an exception "Not Found" that is thrown when a string is not equal to "India" write a program that uses this exception.
24. Write a program, which displays the use of finally. Explain how it is different or similar to catch.

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Program: BCA
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Paper Code: CCCS-521	Total Credit : 2
Title of Paper: Practical Based on CCCS-519	Total Marks : 60 Time : 2:15 Hrs

Unit	Description		Total Marks
	Q.1 Practical Based on C	40	60
	Q.2 Viva – Voce	20	

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Program: BCA
Semester: V

Paper Code: CCCS-522	Total Credit : 4
Title of Paper: Practical based on CCCS-520 and CECS509 OR CECS510	Total Marks : 60
	Time : 2:15 Hrs

1. Viva Based on Network and Network Fundamentals
2. Practical based on Operating system if student has selected as an elective subject
3. Viva Based on Cyber Security if student has selected as an elective subject

KSKV Kachchh University
Program: BCA
Semester: V

Paper Code: CCCS-522	Total Credit : 4
Title of Paper: Practical based on CCCS-520 and CECS509 OR CECS510	Total Marks : 60 Time : 2:15 Hrs

Unit	Description		Total Marks
	Q.1 Practical	40	60
	Q.2 Viva – Voce	20	

KSKV Kachchh University
Program: BCA
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Paper Code: FCCS-506	Total Credit : 2
Title of Paper: Computer Based Optimization Models	Total Marks : 60 Time : 2:15 Hrs

Unit	Description	Weighting
I	**Linear Programming Model** Mathematical Formulation Graphical Solution of linear programming models Simplex method Artificial variable Techniques	25%
II	**Transportation and Assignment Model** Mathematical formulation of transportation problem Methods for finding initial basic feasible solution optimum solution Degeneracy Mathematical formulation of assignment models Hungarian Algorithm, Feasibility of Hungarian Algorithm Variants of the Assignment problem	25%
III	**Scheduling by PERT and CPM** Network Construction – Critical Path Method – Project Evaluation and Review Technique – Resource Analysis in Network Scheduling	25%
IV	**Sequencing and Simulation** Two Machine Problem Three Machine Problem Simulation and related numerical Importance of Simulation in Computer Science	25%

Basic Text & Reference Books :-	
1.	Taha H.A., "Operations Research : An Introduction " 8th Edition, Pearson Education, 2008.
2.	John W. Chinneck "Feasibility and Infeasibility in Optimization Algorithms and Computational Methods' Springer, 2008

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Program: BCA
Semester: V

Paper Code: FCCS-506	Total Credit : 2
Title of Paper: Computer Based Optimization Models	**Total Marks : 60**
	Time : 2:15 Hrs

Unit	Description		Total Marks
I	Q.1(A) Medium Questions (With Internal Option)	07	15
	Q.1(B) Medium Questions / Long Questions (With Internal Option)	08	
II	Q.2(A) Medium Questions (With Internal Option)	06	15
	Q.2(B) Medium Questions / Long Questions (With Internal Option)	09	
III	Q.3(A) Medium Questions / Long Questions (With Internal Option)	06	15
	Q.3(B) Medium Questions / Long Questions (With Internal Option)	08	
IV	Q.4(A) Medium Questions / Long Questions (With Internal Option)	07	15
	Q.4(B) Medium Questions / Long Questions (With Internal Option)	08	

Paper Code: CECS-509	Total Credit : 2
Title of Paper: Cyber Crime and Cyber Security	Total Marks : 60
	Time : 2:15 Hrs

Unit	Description	Weighting
I	Introduction, Cybercrime: Definition and Origins of the Word, Cybercrime and Information Security, Classifications of Cybercrimes: E-Mail Spoofing, Spamming, Cyber defamation, Internet Time Theft, Salami Attack/Salami Technique, Data Diddling, Forgery, Web Jacking, Newsgroup Spam/Crimes Emanating from Usenet Newsgroup, Industrial Spying/Industrial Espionage, Hacking, Online Frauds, Pornographic Offenses , Software Piracy, Computer Sabotage, E-Mail Bombing/Mail Bombs, Usenet Newsgroup as the Source of Cybercrimes , Computer Network Intrusions, Password Sniffing, Credit Card Frauds, Identity Theft	25%
II	**Cyber Offenses** Introduction, Categories of Cybercrime, How Criminals Plan the Attacks: Reconnaissance, Passive Attack, Active Attacks, Scanning/Scrutinizing gathered Information, Attack (Gaining and Maintaining the System Access), Social Engineering, and Classification of Social Engineering, Cyberstalking: Types of Stalkers, Cases Reported on Cyberstalking, How Stalking Works? Real-Life Incident of Cyberstalking, Cybercafe and Cybercrimes, Botnets: The Fuel for Cybercrime, Botnet, Attack Vector Cloud Computing: Why Cloud Computing? , Types of Services, Cybercrime and Cloud Computing	25%
III	**Mobile and Wireless Device** Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era: Types and Techniques of Credit Card Frauds, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices Authentication Service Security: Cryptographic Security for Mobile Devices, LDAP Security for Hand-Held Mobile Computing Devices, RAS Security for Mobile Devices, Media Player Control Security, Networking API Security for Mobile Computing Applications, Attacks on Mobile/Cell Phones: Mobile Phone Theft, Mobile Viruses, Mishing, Vishing, Smishing, Hacking Bluetooth, Mobile Devices: Security Implications for Organizations: Managing Diversity and Proliferation of Hand-Held Devices, Unconventional/Stealth Storage Devices Threats through Lost and Stolen Devices, Protecting Data on Lost Devices, Educating the Laptop Users **Tools and Methods** Introduction, Proxy Servers and Anonymizers, Phishing: How Phishing Works? Password Cracking: Online Attacks, Offline Attacks, Strong, Weak and Random Passwords, Random Passwords, Keyloggers and Spywares: Software Keyloggers, Hardware Keyloggers, Antikeylogger, Spywares, Virus and Worms: Types of Viruses, Trojan Horses and Backdoors: Backdoor, How to Protect	25%

		from Trojan Horses and Backdoors, Steganography: Steganalysis, DoS and DDoS Attacks: DoS Attacks, Classification of DoS Attacks, Types or Levels of DoS Attacks, Tools Used to Launch DoS Attack, DDoS Attacks, How to Protect from DoS/DDoS Attacks, SQL Injection: Steps for SQL Injection Attack, How to Avoid SQL Injection Attacks	
IV		**Cyber Crime : Legal Perspectives** Introduction, Why Do We Need Cyberlaws: The Indian Context, The Indian IT Act: Admissibility of Electronic Records: Amendments made in the Indian ITA 2000, Positive Aspects of the ITA 2000, The Weak Areas of the ITA 2000, Challenges to Indian Law and Cybercrime Scenario in India, Consequences of Not Addressing the Weakness in Information Technology Act Amendments to the Indian ITA 2008: Overview of Changes Made to the Indian IT Act, Cybercafe- Related Matters Addressed in the Amendment to the Indian IT Act, State Government Powers Impacted by the Amendments to the Indian IT Act, Impact of IT Act Amendments Impact Information Technology Organizations, Cybercrime and Punishment, Cyberlaw, Technology and Students: Indian Scenario	25%

Basic Text & Reference Books :-	
1.	"Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Nina Godbole, Sunit Belapur, Wiley India Publications, April, 2011
2.	"Cyberlaw: The Indian Perspective" by Pavan Duggal, Saakshar Law Publications, Delhi.
3.	The Information Technology Act, 200 – Universal Law Publishing Co.

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Paper Code: CECS-509	Total Credit : 2
Title of Paper: Cybercrime and Cyber Security	Total Marks : 60 Time : 2:15 Hrs

Unit	Description		Total Marks
I	Q.1(A) Medium Questions (With Internal Option)	07	15
	Q.1(B) Medium Questions / Long Questions (With Internal Option)	08	
II	Q.2(A) Medium Questions (With Internal Option)	06	15
	Q.2(B) Medium Questions / Long Questions (With Internal Option)	09	
III	Q.3(A) Medium Questions / Long Questions (With Internal Option)	06	15
	Q.3(B) Medium Questions / Long Questions (With Internal Option)	08	
IV	Q.4(A) Medium Questions / Long Questions (With Internal Option)	07	15
	Q.4(B) Medium Questions / Long Questions (With Internal Option)	08	

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Paper Code: CECS-510	Total Credit : 2
Title of Paper: Operating System	Total Marks : 60 Time : 2:15 Hrs

Unit	Description	Weighting
I	**Introduction** Operating system software, Types of operating system **Process Management and Process Synchronization** Process scheduling policies, Process scheduler, Scheduling algorithms(FCFS, SJN, Priority, SRT, RR), Parallel Processing, Process Synchronization, Test and set, WAIT and SIGNAL, Semaphores, Process Cooperation, Producer and Consumers, Readers and Writers	25%
II	**Deadlock** Deadlocks, Conditions for deadlock, Deadlock modedling, Strategies for handling deadlocks, Starvation (The dining philosopher problem) **Memory Management** Single-user contiguous scheme, Fixed partition, Dynamic partition , Allocation and deallocation methods, Relocatable dynamic partition, Paged memory allocation, Demand paging, Page replacement algorithms (FIFO, LRU), Paging, Segmentation, Virtual Memory	25%
III	**File Management and Device Management** File manager, Interacting with file manager, Physical storage allocation, Data compression, Access methods, Access controls System Devices, Direct access storage devices, Component of the I/O subsystem, Communication among devices, management of I/O requests, Device handler seek strategies	25%
IV	**Overview of Linux Operating System** Locating commands, Internal and external commands, Command structure, Flexibility of usage. man, cal, date, echo, printf, bc, script, passwd, who, uname, tty The parent-child relationship, Absolute and relative path names, The HOME variable, file attributes, compressing and archiving files, ls, pwd, mkdir, cd, rmdir, cat, cp, rm, mv, more, file, wc, od, cpm, comm., diff, gzip, gunzip, tar, zip and unzip, chmod, ln, unmask, find Working with Bourne shell and Bash shell Wild-card, Redirection, Pipes and tee	25%

Basic Text & Reference Books :-	
1.	Understanding Operating Systems Ida M. Flynn/Ann Mciver Mchoes, Thomson Learning
2.	UNIX Concepts and applications, Sumitabha Das, 3rd Edition TMH

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Semester: V

Paper Code: CECS-510	Total Credit : 2
Title of Paper: Operating System	Total Marks : 60 Time : 2:15 Hrs

Unit	Description		Total Marks
I	Q.1(A) Medium Questions (With Internal Option)	07	15
	Q.1(B) Medium Questions / Long Questions (With Internal Option)	08	
II	Q.2(A) Medium Questions (With Internal Option)	06	15
	Q.2(B) Medium Questions / Long Questions (With Internal Option)	09	
III	Q.3(A) Medium Questions / Long Questions (With Internal Option)	06	15
	Q.3(B) Medium Questions / Long Questions (With Internal Option)	08	
IV	Q.4(A) Medium Questions / Long Questions (With Internal Option)	07	15
	Q.4(B) Medium Questions / Long Questions (With Internal Option)	08	