



Rayat Shikshan Sanstha's
Yashavantrao Chavan Institute of Science, Satara

**SYLLABUS FOR
B.Sc. Computer Applications**

**First Year SEMESTER I / II
w.e.f. June 2023**

NEP 2020

1. INTRODUCTION

The B.Sc. Computer Applications Programme is focused on universities and colleges providing undergraduate studies which would also incorporate specific job roles along with broad based general education. This would enable the graduates completing B.Sc. to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge.

The proposed B.Sc. Programme in Computer Applications will be a judicious mix of skills, professional education related to Software Applications and also appropriate content of general education. It is designed with the objective of equipping the students to scope with the emerging trends and challenges in the Software Industries.

2. ELIGIBILITY FOR ADMISSION

Eligibility for admissions and reservation of seats for B.Sc. Computer Applications shall be according to the rules framed by the University from time to time. No student shall be eligible for admission to B.Sc. Computer Applications unless he/she has successfully completed the examination conducted by a Board/ University at the +2 level of schooling or its equivalent in science stream.

3. NATURE OF THE COURSE

This course follows 2(b) pattern of the University under first degree CBCS program with appropriate modifications.

- Open course is envisaged
- Electives are include
- Total credits enhanced to 176.
- Multiple exit points are permitted, that is, if willing, candidate can quit after the successful completion of first & second year. Candidate do so, can't be re- entered.

CURRICULUM

The curriculum in each of the years of the Programme would be a suitable mix of general education and skill development components.

Department of B.Sc. Computer Applications
“NEP Implementation 2020”
BSc. Computer Applications

	Major: Computer Applications				Minor: Computer Applications		GE/OE Programs(Other)	
Class	Sem	Paper No.	Paper Title	Credit	Paper Title	Credit	Paper Title	Credit
B.Sc.- I	I	Paper - I	Computer Fundamentals & Applications	2	Computational Electronic and Hardware - I	2	Introduction to Social media	2
		Paper -II	Concepts of Operating System	2	Computational Mathematics- I	2	Digital Media and Marketing	2
		Practical - II	Lab-I (Computer Fundamentals & Application + Concepts of Operating System)	2	Lab-I (Computational Electronic and Hardware - I + Computational Mathematics I)	2	Lab-I (Introduction to Social media and Digital Media and Marketing)	2
	II	Paper -III	Computer Programming-I	2	Computational Mathematics - II	2	Fundamental of Web Analytics	2
		Paper -IV	Database Management System	2	Computational Electronic and Hardware - II	2	Fundamental of Search Engine Optimization	2
			Practical II	Lab-II (Computer Programming-I + Database Management System)	2	Lab-II (Computational Mathematics - I + Computational Electronic and Hardware - II)	2	Lab-II (Fundamental of Web Analytics and Fundamental of Web Analytics)

SEMESTER-I**Major Course I:****BCAT – 111 : Computer Fundamentals & Applications****Course Objectives: Student should be able to ...**

1. Understand fundamental of computers.
2. Describe the concepts Central Processing Unit.
3. Understand the concept of computer language.
4. Learn the concept of Microsoft Office.

No of Credits: 2	Topic	No of Hours (30)
Unit I	Introduction to Computer	8
	<ul style="list-style-type: none"> • Introduction to Computer • Characteristics of Computer • Applications of Computer • Generation of Computer • Types of Computers • Components of Computer System • Central Processing Unit (CPU) • input/output Devices • Computer Memory - Primary and secondary memory • Magnetic and optical storage devices 	
Unit II	Number System and Computer Language	8
	<p>Number System :</p> <ul style="list-style-type: none"> • Decimal, Binary • Octal & Hexadecimal • Conversion from One base to another base <p>Computer Codes :</p> <ul style="list-style-type: none"> • BCD • EBCDIC • ASCII <p>Computer Language:</p> <ul style="list-style-type: none"> • Machine Language • Assembly Language • High Level Languages 	
Unit III	MS – Word and MS – Excel	8
	<ul style="list-style-type: none"> • Introduction • Shortcuts • Working and Formatting with Documents • Creating Tables • Macros • Mail merge • Printing Documents 	

	MS-EXCEL – <ul style="list-style-type: none"> • Introduction to Excel • Sorting • Queries • Graphs • Scientific functions. 	
Unit IV	MS – PowerPoint and MS - Access	6
	<ul style="list-style-type: none"> • POWERPOINT : • Introduction to Power Point • Creation of Slides • Inserting pictures • Preparing slide show with animation. • MS - ACCESS : • Creation • Manipulation of Files. 	

Course Outcomes: Student will be able to ...

1. Explain the basic concepts of computer
2. Use block diagram Central Processing Unit
3. Compare different computer language
4. Use different Microsoft tool.

REFERENCE Books:

1. J. Glenn Brookshear (2022) - "Computer Science: An Overview".
2. P. K. Sinha and Priti Sinha (2021) - "Computer Fundamentals".
3. Peter Norton (2020) - "Introduction to Computers".
4. Faithe Wempen (2023) - "Computing Fundamentals: Introduction to Computers".
5. Reema Thareja (2021) - "Computer Fundamentals".
6. B. Ram (2020) "Computer Fundamentals: Architecture and Organization".
7. Nell Dale and John Lewis (2022) - "Computer Science Illuminated".
8. Leon and Leon (2021) - "Computer Fundamentals and Information Technology".
9. Misty Vermaat, Susan Sebok, and Steven Freund (2022) - "Discovering Computers".
10. V. Rajaraman (2020) - "Fundamentals of Computers".

Major Course II: BCAT 112: Concept of Operating System

Course Objectives: Student should be able to ...

1. Understand the basics and functions of Operating System.
2. Learn various memory management schemes.
3. Study Scheduling Algorithm and process Synchronization.
4. Understand Processes and threads.

No of Credits: 2	Topic	No of Hours (30)
Unit I	Introduction to Operating System	8
	<ul style="list-style-type: none"> • Computer System • Elements and organization • Operating System Overview • Objectives and Functions • Evolution of Operating System • Operating System Structures • Operating System Services • User Operating System Interface • System Calls – System Programs • Design and Implementation - Structuring methods. 	
Unit II	Process Management	8
	<ul style="list-style-type: none"> • Processes - Process Concept • Process Scheduling • Operations on Processes • Inter-process Communication • Deadlock - Methods for handling deadlocks • Deadlock prevention • Deadlock avoidance • Deadlock detection • Recovery from deadlock. 	
Unit III	Memory Management	6
	<ul style="list-style-type: none"> • Main Memory wrapping • Contiguous Memory Allocation • Paging - Structure of the Page Table • Segmentation • Segmentation with paging • Virtual Memory - Demand Paging • Copy on Write - Page Replacement • Allocation of Frames –Thrashing. 	
Unit IV	Storage Management	8
	<ul style="list-style-type: none"> • Mass Storage system • Disk Structure - Disk Scheduling and Management • File-System Interface • File concept • Access methods • Directory Structure - Directory organization 	

	<ul style="list-style-type: none"> • File system mounting - File Sharing and Protection • File System Implementation - File System Structure • Directory implementation - Allocation Methods • Free Space Management • I/O Systems – I/O Hardware • Application I/O interface • Kernel I / O subsystem. 	
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Course Outcomes: Student will be able to ...

1. Analyze various scheduling algorithms and process synchronization.
2. Explain deadlock prevention and avoidance algorithms.
3. Compare and contrast various memory management schemes.
4. Explain the functionality of file systems, I/O systems, and Virtualization

REFERENCE Books:

1. Ramaz Elmasri , A. Gil Carrick, David Levine(2010), “*Operating Systems – A Spiral Approach*”, Tata McGraw Hill Edition.
2. William Stallings (2018), "*Operating Systems: Internals and Design Principles*", 7th Edition, Prentice Hall.
3. Achyut S.Godbole, Atul Kahate(2014), “*Operating Systems*”, McGraw Hill Education.
4. M.V. Wilkes(May,1991) : "Software and the programmer", *Comm.ACM* 35#5.
5. K. Skytte (March,1994): "*Engineering a small system*", *IEEE Spectrum* 31#3, 63.
6. M.G. Lane, J.D. Mooney(1988) : *A practical approach to operating systems*.
7. Silberschatz, P.B. Galvin (1994) : “*Operating system concepts*” (Addison-Wesley, fourthedition).
8. S.E. Madnick, J.J. Donovan(McGraw-Hill, 1974): “*Operating systems*”.
9. D.D. McCracken, H. Weiss, T.-H. Lee (Wiley, 1959) : “*Programming Business Computers*”.
10. M.V. Wilkes (23 May,1991): "*Software and the programmer*", *Comm.ACM* 35#5,

LAB-I: BCAP 113 : Based on BCAT 111 and BCAT 112**Computer Fundamentals & Application and Concepts of Operating System.****Course Objectives: Students should be able to....**

1. Understand Computer Fundamentals – hardware and Software.
2. Understand computer Architecture.
3. Study Office automation tools.
4. Learn Basic Number System.

Credits (Total Credits 2)	SEMESTER - I LAB COURSE – I : BCAP 113 Computer Fundamentals & Applications + Concepts of Operating System	No. of hours 60 Hrs.
Computer Fundamentals & Application		
1	Searching for a web site / application / text documents viewing and downloading	2
2	Create an E-mail account, retrieving messages from inbox, replying, attaching files filtering and forwarding	2
3	Preparing a Govt. Order / Official Letter / Business Letter / Circular Letter Covering formatting commands - font size and styles - bold, underline, upper case, lower case, superscript, subscript, indenting paragraphs, spacing between lines and characters, tab settings etc.	2
4	Preparing a newsletter: To prepare a newsletter with borders, two columns text, header and footer and inserting a graphic image and page layout.	2
5	Creating and using styles and templates to create a style and apply that style in a document to create a template for the styles created and assemble the styles for the template.	2
6	Creating and editing the table to create a table using table menu to create a monthly calendar using cell editing operations like inserting, joining, deleting, splitting and merging cells to create a simple statement for math calculations viz. Totaling the column.	2
7	Creating numbered lists and bulleted lists to create numbered list with different formats (with numbers, alphabets, roman letters) To create a bulleted list with different bullet characters.	2
8	Printing envelopes and mail merge. To print envelopes with from addresses and to addresses To use mail merge facility for sending a circular letter to many persons To use mail merge facility for printing mailing labels.	2
9	Using the special features of word to find and replace the text To spell check and correct. To generate table of contents for a document to prepare index for a document.	2
10	Create an advertisement Prepare a Template. Prepare a Corporate Circular letter inviting the shareholders to attend the Annual Meeting in PowerPoint.	2
11	Creating a new Presentation based on a template – using Auto content wizard, design template and Plain blank presentation	2
12	Creating a Presentation with Slide Transition – Automatic and Manual with different effects.	2
13	Creating a Presentation applying Custom Animation effects – Applying multiple effects to the same object and changing to a different effect and removing effects.	2
14	Creating and Printing handouts.	2
	Creating a table in Excel and perform various mathematical operation on it.	

15		2
Concepts of Operating System		
1	Study of Different OS Installation and its working.	2
2	Study of Basic commands to understand the system and working of Linux.	2
3	To make folder and subfolder.	2
4	To make directory and subdirectory.	2
5	To show system Date and Time.	2
6	To show Internal Protocol Configuration.	2
7	To show System Information.	2
8	Any 10 commands of Linux.	2
9	Write a menu driven shell script which will print the following menu and execute the given task. <ol style="list-style-type: none"> 1. Display calendar of current month 2. Display today's date and time 3. Display usernames those are currently logged in the system 4. Display your name at given x, y position 5. Display your terminal number 	2
10	Write a shell script to read n numbers as command arguments and sort them in descending order.	2
11	Write a program for process creation using C. (Use of gcc compiler).	2
12	Write a shell script to check entered string is palindrome or not.	2
13	Study of Advance commands and filters of Linux/UNIX	2
14	Write an awk program using function, which convert each word in a given text into capital.	2
15	Write a shell script to find factorial of given number n.	2

Course Outcomes: Students will be able to....

1. Create email and send mail.
2. Write basic program.
3. Write basic command.
4. Operate Windows operating system, Linux Operating System
5. Making directories.

Reference Books: -

1. Andrew S. Tanenbaum, "Modern Operating System 6/c", PHI, 2011/12
2. Silberschatz, P.B. Galvin, G. Gagne, "Operating System Concepts 8/e", Wiley India, 2014
3. ISBN: 9788126520510
4. Andrew S. Tanenbaum, "Distributed Operating System", Pearson
 - a. D M Dhamdhare, "System Programming and Operating System",
 - b. Tata McGraw-Hill, 2009

Minor Paper SEM-I**(30)****BCAT-114 : Computational Mathematics - I****Course Objectives: Student will be able to ...**

1. Understand recursive techniques to count element of set and knowledge of set theory.
2. Solve simple application problems related to computer based on these.
3. Construct simple mathematical proofs and possess ability to verify them
4. Learn the concept of Divisibility of integers

SYLLABUS:**Credit: 02**

No of Credits: 2	Topic	No of Hours (30)
Unit I	Logic	8
	<ul style="list-style-type: none"> • Introduction, Definition: Statement (Proposition). • Types of Statements: Simple and compound statements, Truth values of a statement, Truth Tables and construction of truth tables. • Logical Operations: Negation, Conjunction, Disjunction, Implication, Double Implication, Equivalence of Logical statements. • Statement forms: Tautology, Contradiction, and Contingency. • Laws of logic: Idempotent laws, Commutative laws, Associative laws, Distributive laws, Complement laws, De Morgan's laws. 	
Unit II	Set Theory	8
	<ul style="list-style-type: none"> • Introduction, definition of set, subset. • Methods of describing of a set: Tabular form, Set builder form, Cardinality of set. • types of set: Finite set, Infinite set, Empty set, Universal set, Equal sets, Disjoint sets, complementary set. • Operation on Sets: Union of sets, Intersection of sets, Difference of sets. • De Morgan's Laws. • Cartesian product of two sets. • Properties of set operations: Commutative law, Associative law, Distributive law. 	
Unit III	Functions and Relation	6
	<ul style="list-style-type: none"> • Introduction of function, Domain, Codomain, Range of Function, Operation on function • Definition of Relation, Reflexive relation, Symmetric relation, Transitive relation, Inverse Relation, Equivalence Relation, Identity Relation. 	
Unit IV	Divisibility of integers	8
	<ul style="list-style-type: none"> • Introduction, Divisibility Definition and Properties. • Division algorithm. • Greatest common Divisor (GCD). • Least common multiple (LCM), Prime number. • Euclidean algorithm. • Fundamental theorems of Arithmetic (Statement) 	

Course Outcomes: Student should be able to ...

1. Apply logic when creating systems.
2. Demonstrate mathematical skills, analytical and critical thinking abilities.
3. Analyze the types of relations and function.

REFERENCES:

1. S.R. Patil and others "*A text book of Discrete mathematics*" (India : NIRALI Prakashan .2008).
2. Oscar Levin, *Discrete Mathematics – An Open Introduction* (Greeky University of Northen Colorado Press,2013).
3. Gaisi Takeuti,SAML (2018), "*Advances in Mathematical Logic by professor* "".
4. S.C. Malik and Savita Arora, "*Mathematical Analysis (Fifth Edition)*", New Age International (P) Limited, 2017(UNIT I, II, III, IV).
5. Davender Malik, "*Discrete Mathematics (India: Indian Binding House, 2009), Unit 1: 226-262, Unit 3: 413-442, Unit 4:263-291*".
6. Ken Levasseur, Al Doerr, "*Applied Discrete Structures (Pearson Education, Inc. 2012), Unit 1: 20-33, Unit 2: 100-133, Unit 3:343-361, Unit 4:149-159*".
7. U.Langote, "*Discrete Mathematics (Pune: Tech-Max Publications, 2009), Unit 1: 6.1-7.3 , Unit 2: 8.1-9.5 , Unit 3:10.1-10.4*".

BCAT-115: Computational Electronic and Hardware - I

Course Objectives: Student will be able to ...

1. Design Hardware Circuits.
2. Understand computer Hardware Devices.
3. Learning various Electronics Tools.
4. Understand the Digital Electronics.

SYLLABUS:

Credit: 02

No of Credits: 2	Topic	No of Hours (30)
Unit I	Basic components	8
	<ul style="list-style-type: none"> • Introduction • AC & DC sources • Active & Passive Components • Classification(Resistor, capacitor, inductor) • Resistor Color code technique • Applications • Series & Parallel combination • Transformer • Switches 	
Unit II	Fundamental of Digital Electronics	8
	<ul style="list-style-type: none"> • Study of number systems (binary, decimal, Octal, hexadecimal) and conversions. • Introduction to Boolean algebra • Logic Gates(AND,OR,NOT,NAND,NOR,XOR,XNOR) • Universal Gate 	
Unit III	Peripheral Devices	6
	<ul style="list-style-type: none"> • Basic components of computer system (CPU, storage, Input/Output devices) • Functions and characteristics of each hardware component • Basics of computer networks (LANs, MANs, WANs). 	
Unit IV	Computer Organization	8
	<ul style="list-style-type: none"> • Memory • Introduction, classification, characteristics (RAM,ROM,DRAM,EPROM, Cache memory, FLASH memory) • Computer architecture • von Neuman architecture • parallel processing 	

Course Outcomes: Student should be able to ...

1. Construct hardware circuits by using electrical components.
2. Use Basic of electronics components.
3. Study the Conversions of number systems.
4. Use different Electrical components and Hardware circuits.

REFERENCES:

1. Sedha.R.S , (New Delhi: S Chand Publication,2012) , "*A text of Applied Electronics*".
2. Thereja.B.L. (New Delhi: S. Chand & Company LTD,2005) , "*Basic Electronics Solid State*".
3. Streetman Ben Z and S. Banerjee, (New Delhi: Pearson Education, 2006) , "*Solid State Electronic Devices*".
4. Mithal.G.K , (Delhi: Khanna publication,1997), "*Electronic Devices and Circuits*".

LAB-I: BCAP 116 : Based on BCAT 114 and BCAT 115**Computational Mathematics - I + Computational Electronic and Hardware - I****Course Objectives: Students will be able to....**

1. Understand Fundamentals of Electronics – hardware
2. Learn How to Design hardware.
3. Understand the basic of logic.
4. Study Digital electronics.

Credits (Total Credits 2)	SEMESTER - I LAB COURSE – I : BCAP 116 Computational Mathematics – I + Computational Electronic and Hardware – I	No. of hours 60 Hrs.
Computational Mathematics – I		
1	Problems on Logical operation.	2
2	Laws of logic with an example.	2
3	Examples on Tautology, Contradiction, and Contingency.	2
4	De Morgan's law with an example.	2
5	Cartesian product of set and Difference of set with an example.	2
6	Example of Functions and Relation.	2
7	Greatest common divisor and Least common Multiplier with an example.	2
8	Examples of Operations and function.	2
9	Examples of Tautology, Contradiction and contingency.	2
10	Euclidian algorithm with an examples.	2
Computational Electronic and Hardware – I		
1	Study of Electronics Components and Tools.	2
2	Study of Voltage source in series and parallel.	2
3	Study of Logic Gates (AND, OR, NOT).	2
4	Study of Universal Gates.	2
5	Study of Input/Output Devices of Computer.	2
6	Study of Computer Architecture (Von Neuman).	2

7	Implement the Boolean function using Basic Gates.	2
8	Familiarization with Capacitor and Inductor in series and parallel.	2
9	Study of voltage and current Dividers.	2
10	Study of Installation process of Printers.	2

Course Outcome: Students should be able to....

1. Understand the Conversions of number systems.
2. Develop the concept of digital electronics.
3. Understand the different electrical component.
4. Understand the foundations of mathematics.
5. Develop and maintain problem- solving skills.

Reference Books: -

1. Sedha.R.S. (New Delhi: S Chand Publication,2012), "*A text of Applied Electronics*"
2. Thereja.B.L. (New Delhi: S. Chand & Company LTD,2005), "*Basic Electronics Solid State*".
3. Streetman Ben Z and S. Banerjee, (New Delhi: Pearson Education, 2006) "*Solid State Electronic Devices*".
4. Mithal.G.K , (Delhi: Khanna publication,1997) "*Electronic Devices and Circuits*".
5. S.R.Patil and others "*A text book of Discrete mathematics*" (India : NIRALI Prakashan .2008)
6. Oscar Levin, Discrete Mathematics, "*An Open Introduction*" , (Greeky University of Northen Colorado Press,2013).

1.

Open Elective Paper SEM-I**Paper-I Introduction to Social media****(30)****Course Objectives: Student will be able to ...**

1. Study about role of digital channel business.
2. Understand knowledge of basic concepts of social media, Facebook marketing, YouTube marketing, email and mobile marketing, and marketing automation.
3. Imbibe different types of e-commerce web sites and different modes of payments.
4. Study security and legal issues in mobile marketing.

SYLLABUS:**Credit: 02**

No of Credits: 2	Topic	No of Hours (30)
Unit I	Introduction Social Media	8
	<ul style="list-style-type: none"> • Introduction to Social Media • Modern Communication • Social Media Landscape Social Media and Content Marketing • Reputation Management and Monitoring Customer Engagement • Social Media Impact On Business Goals • Social Media Marketing Integration • Strategic Business channel • Types of Content to Post and Promote. 	
Unit II	Social Media Channel Management	6
	<ul style="list-style-type: none"> • Introduction to Social Networking • Microblogging • Media Sharing Videos Media Sharing Images • Other Services • Social Media Management Tools Impact on Business Goals • Buffer • Hoot suite • Social Studio • Link Shortened. 	
Unit III	Social Media Measurement and Reporting	8
	<ul style="list-style-type: none"> • Introduction to social media measurement • Key Performance Indicators • Social Analytics Tools • Social Advertising • Social Advertising Key Factors • Advertising Campaign in LinkedIn and Facebook • Facebook Marketing • Understanding Facebook Algorithm • Groups, Pages, Messenger 	

	<ul style="list-style-type: none"> • Facebook Live, Managing Facebook, Facebook Marketing Tools • Understanding Facebook Ads, Creating Your Facebook Ad. 	
Unit IV	Mobile Marketing and Digital strategy	8
	<ul style="list-style-type: none"> • Introduction to Mobile Marketing • Mobile Products and Services • Promotions and Incentives Integration with Marketing Mix • Mobile Advertising • Mobile Analysis • Rules and regulations Digital Marketing Strategy • Create Narratives • Customer Needs • Market research. 	

Course Outcomes: Student should be able to ...

1. Analyze Role of IT in business.
2. Create Virtual marketing advertisement.
3. Aware of different types of e-commerce web sites and different modes of payments
4. Aware of security and legal issues in digital and mobile marketing.

REFERENCES:

1. Erfan Turban(2003). *Electronic Commerce–A Managerial Perspective*, Pearson Education(Unit I-Unit IV).
2. **Additional:** R Kalokota, Andrew V. Winston (2004), *Electronic Commerce – a Manger’sguide*, Pearson(Unit I-Unit IV).
3. Bagozzi, R.P., and U.M. Dholakia. (2006). “Antecedents and Purchase Consequences of Customer Participation in Small Group Brand. Communities.” *International Journal of Research in Marketing* 23
4. Barnes, N.G., and C. Daubitz. (2017). Time for Re-evaluation? Social Media and
5. Battelle, J. (2005). Search. Nicholas Brealey Publishing.

Paper-II Digital Media and Marketing

Course Objectives: Student will be able to ...

1. Study about social media marketing.
2. Understand knowledge of basic concepts of social media, Facebook marketing, and marketing automation.
3. Imbibe different types of Applications
4. Study security and legal issues in marketing.

SYLLABUS:

Credit: 02

No of Credits: 2	Topic	No of Hours (30)
Unit I	Fundamentals of Social Media Marketing	6
	<ul style="list-style-type: none"> • Fundamentals of Social Media Marketing & its significance • Necessity of Social media Marketing • Building a Successful strategy: Goal Setting, Implementation. 	
Unit II	Facebook Marketing	10
	<ul style="list-style-type: none"> • Facebook Marketing: Facebook for Business • Facebook Insight • Different types of Ad formats • Setting up Facebook Advertising Account • Facebook audience & types • Designing Facebook Advertising campaigns • Facebook Avatar • Apps • Live • Hashtags. 	
Unit III	LinkedIn Marketing	7
	<ul style="list-style-type: none"> • LinkedIn Marketing: Importance of LinkedIn presence • LinkedIn Strategy • Content Strategy • LinkedIn analysis • Targeting • Ad Campaign. 	
Unit IV	Twitter Marketing	7
	<ul style="list-style-type: none"> • Twitter Marketing:- Basics • Building a content strategy • Twitter usage • Twitter Ads • Twitter ad campaigns • Twitter Analytics • Twitter Tools and tips for managers • Instagram & Snapchat basics. 	

Course Outcomes: Student should be able to ...

1. Make digital marketing.
2. Use different marketing applications.
3. Create and campaign social advertising.
4. Create own digital marketing agency.

REFERENCES:

1. Digital Marketing –Kamat and Kamat-Himalaya 2019
2. Marketing Strategies for Engaging the Digital Generation, D. Ryan, 2021
3. Digital Marketing, V. Ahuja, Oxford University Press 2020

Paper-I and II LAB-I**Introduction to Social media and Digital Media and Marketing****Course Objectives: Students will be able to....**

1. Understand different social media platform
2. Learn social media application marketing.
3. Study the social media market research
4. Understand own creating social adds.

Credits (Total Credits 2)	SEMESTER - I LAB COURSE – I : Introduction to Social Media + Digital Media and Marketing	No. of hours 60 Hrs.
1	Research the different social media platforms and choose the one social media platform that you will use to market your hotel, restaurant, event, or destination on.	2
2	Ensure that the social media platform you choose is the best social media marketing channel to reach your target audience and help generate revenue for your business/destination.	2
3	Name the social media platform you chose to market your message.	2
4	Based on your learning in your course modules, write a minimum of 100 words on who your target audience is for your marketing strategy.	2
5	What are the demographics of your audience?	2
6	Identify who your audience will be.	2
7	What are the social influences that your audience have?	2
8	List three strategies that you will use to engage and build your target audience based on the social media channel you choose	2
9	Explain your rationale for each one of the three.	2
10	Explain how often will you post a marketing message in the two-month time period you have to market, explain why?	2
11	What time of day will you engage with your users to maximize the impact of you're marketing and why?	2
12	Explain how your research will support your decisions and create the impact you wish.	2
13	Build an actual public page of your chosen company, on the social media platform.	2

14	Reach (the number of people who saw your post).	2
15	Impressions (the number of times your post was seen).	2

Course Outcome: Students should be able to....

1. Creating own social media page.
2. Using various applications.
3. Create social media ads

Reference Books: -

1. Digital Marketing, S. Gupta, McGraw-Hill
2. Quick win Digital Marketing, H. Annmarie , A. Joanna, Paperback edition

SEM-II**Major Paper SEM-II****BCAT- 211 : Computer Programming – I****(30)****Course Objectives: Student will be able to ...**

1. Understand algorithmic thinking and algorithm presentations
2. Learn Basic data types and control structures in C.
3. Studies of structured programming concepts.
4. Able to use standard library functions in C Language.

SYLLABUS:**Credit: 02**

No of Credits: 2	Topic	No of Hours (30)
Unit I	Introduction to programming	8
	<ul style="list-style-type: none"> • Character set • Variables and Constants • Rules for naming the Variables/Identifiers • Basic data types of C Int, char, float, double • storage capacity – range of all the data types • Storage classes 	
Unit II	Control Structure	6
	<ul style="list-style-type: none"> • Operators and Expressions • Precedence of Operators, • Simple I/O statements • Control structures – if, if else, switch- case, for, while, do-while, break, continue. 	
Unit III	Arrays	6
	<ul style="list-style-type: none"> • Arrays • Declaration, initialization and processing • Defining simple arrays • Multi-dimensional arrays • Strings: Strings Manipulation • Arrays of Strings. 	
Unit IV	Function	10
	<ul style="list-style-type: none"> • Functions: Definition • Return values & their types • function call, recursion • passing Arrays to Functions • String functions (strcpy(), strcmp(), strcat(), strlen(), strrev()). 	

Course Outcomes: Student should be able to ...

1. Uses Variables and Constants.
2. Use Basic data types of C.
3. Do concept of modular programming.
4. Work with Array & its types.
5. Create functions

REFERENCES:

1. Ashok N. Kamthene, *Programming in C*, Pearson Education, Second edition, 1 April 2011.
2. E. Balaguruswamy, *Programming in ANSI C*, McGrawhill, Sixth Edition, January 2010
3. Jagamohan Medak, Parth Pratim Gogoi, *Basics of C Programming*, Chiranjit Hazarika (22 June 2018).
4. Vinod Yadav, *Modern C Programming*, August 17, 2021.
5. Yashavant Kanetkar, *Let Us C*, bpb Publication (2018).
6. Rajiv Chopra, *C Programming An Introduction*, (April 2018).
7. Brian W. Kernighan / Dennis Ritchie, *The C Programming Language*, Pearson Education, Second edition, 1 January 2015.
8. Yashavant Kanetkar, *Let Us C*, bpb Publication (2021).
9. Tim Warren, *C Programming for beginners*, Ingram Publishing (17 December 2019)
10. Greg Perry, *C Programming Absolute Beginner's Guide*, Que Publishing

BCAT – 212: Database Management System

Course Objectives: Student will be able to ...

1. Learn fundamental concepts of data.
2. Describe the basic concepts of DBMS and various databases used in real applications
3. Learn the principles behind systematic database design approaches.
4. Study the database structure by applying the concepts of Entity relational model and Normalization.

SYLLABUS:

Credit: 02

No of Credits: 2	Topic	No of Hours (30)
Unit I	Introduction to Database Management Systems	10
	<ul style="list-style-type: none"> • Definition of Database • Characteristics of database • Data models • Importance of datamodels • ER Model • Relational Model • Network Model • Hierarchical Model • Object Oriented Model • Concept of DBMS • DBMS architecture and data independence. 	
Unit II	Entity Relationship Modeling and Relational Data Model	8
	<ul style="list-style-type: none"> • Entities • Attributes and Entity Sets • Relation and Relationships sets • Features of E-R Model • Relational Model - Basic concepts, • Types of constraints(relational constraints) • DFD and its Types • ERD and types of relationship 	
Unit III	Basics of Structured Query Language	6
	<ul style="list-style-type: none"> • Basic SQL Queries • DDL (Create, Alter, Drop) Commands • DML (Insert, Update, Delete) Commands • Select Statement • Constraints(Primary Key, Foreign Key, Unique Key, Null ,Check, Default, Super Key, Candidate Key) • Datatypes , • Operators • Functions. 	
Unit IV	Organization of Database System	6
	<ul style="list-style-type: none"> • Introduction of file • File types 	

	<ul style="list-style-type: none"> • Organization of file- heap file organization • Serial file organization • Sequential • Index sequential file • Random access file (direct access file) • Types of Database System • Centralized database system • Client-server system • Distributed database system 	
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Course Outcomes: Student should be able to ...

1. Demonstrate basics of different database models for software development.
2. Identify the basic concepts and various data model used in database design
3. Apply relational database theory and be able to describe relational algebra expression, tuple and domain relation expression for queries.
4. Identify the purpose of query processing and optimization and also demonstrate the basic of query evaluation.

REFERENCES:

1. Abraham Silber Schatz , Henry F. Korth, S. Sudarshan (2021) - Database System Concept .
2. Carlos Coronel and Steven Morris(2014) - Database Systems: Design, Implementation, and Management.
3. C.J. Date(2009)- SQL and Relational Theory: How to Write Accurate SQL Code.
4. C.J. Date(1905) - An Introduction to Database Systems.
5. Raghu Ramakrishnan and Johannes Gehrke (2002) - Database Management Systems.
6. Hector Garcia-Molina, Jeff Ullman, and Jennifer Widom (2008) - Database Systems: The Complete Book
7. Ramez Elmasri, Shamkant B. Navathe(2003) - Fundamentals of Database Systems.
8. C.J. Date(2013) - Relational Theory for Computer Professionals.
9. Thomas Connolly, Carolyn Begg (2014) - Database Systems.
10. Ramez Elmasri, Shamkant B. Navathe(2016) - Fundamentals of Database Systems, Global Edition

LAB-III: BCAP 213 : Based on BCAT 211 and BCAT 212**Computer Programming – I and Database Management System****Course Objectives: Students will be able to....**

1. Learn Basic Programming Concepts
2. Study different basic concepts arrays in C
3. Understand the different concepts of operations on Pointers.
4. Learn the DDL and DML Query.

Credits (Total Credits 2)	SEMESTER - II LAB COURSE – I : BCAP 213 Computer Programming – I + Database Management System	No. of hours 60 Hrs.
Computer Programming – I		
1	Write a C program to display “This is my first C Program”.	2
2	Write a C program to find if a given no. is prime or not	2
3	Write a C program to compute Fibonacci series	2
4	Write a C program to insert an element in one dimensional array at a given position	2
5	Write a C program to delete an element from one dimensional array.	2
6	Write a C program to multiply a 3*3 matrix.	2
7	Write a C program to check if given string is palindrome or not.	2
8	Write a C program using function to find sum of two numbers with no argument & no return value	2
9	Write a C program to perform addition, subtraction, division and multiplication of two numbers.	2
10	Write a C program to reverse the entered string from command line arguments.	2
11	Write a program to input two numbers and display the maximum number.	2
12	Write a C program to calculate area and circumference of a circle.	2
13	Write a C program to check prime and Armstrong number by making functions	2
14	Write a C program to find the sum of natural numbers using recursion	2
15	Write a C program to calculate the factorial of a number using recursion	2
Database Management System		
1	In the Database file Add these Fields: (Total: Datatype- Number 3 digits, Percentage: Datatype – Number 3 digits with 2 decimal places, Grade: Datatype- Char with 2 letters)	2
2	Insert more 3 records in MARKSHEET using SQL mode	2
3	Update the values for newly added columns i.e. Total, Percentage, Grade table using UPDATE command. (Grades should be A1 to E2 as per CBSE exam pattern)	2
4	Display all records of the marksheet table, write SQL command	2
5	Display name, rollno, marks of 3 subjects, total and percentage using design view.	2
6	Write SQL command to display name, rollno, grades from the marksheet table.	2
	Display the maximum and minimum marks for Sub101 using design	2

7		
8	Display the sum of marks for Sub102 using SQL command.	2
9	Display the rollno, student name and percentage whose name starts with A using SQL command.	2
10	Display the rollno, student name and percentage whose name second letter is 'I' using SQL command.	2
11	Display all the records from the marksheet table whose name ends with 'N' using SQL command.	2
12	Display the rollno, name and percentage whose percentage are more than 70.	2
13	Display the records who secured the grade A1 and A2.	2
14	Display all the record in ascending order of names using SQL view.	2
15	Delete the records from table who is failed in any of the subject. (You can use any mode)	2

Course Outcome: Students should be able to....

1. Develop skills for writing programs using 'C'.
2. Develop a Programming logic.
3. Exhibit critical and creative thinking skills for analysis and evaluation of problems.
4. Create database and used SQL command.

Reference Books: -

1. Carlos Coronel and Steven Morris (2014) - Database Systems: Design, Implementation, and Management
2. Hector Garcia-Molina, Jeff Ullman, and Jennifer Widom (2008) - Database Systems: The Complete Book
3. Rajiv Chopra, *C Programming An Introduction*, (April 2018).
4. Brian W. Kernighan / Dennis Ritchie, *The C Programming Language*, Pearson Education, Second edition, 1 January 2015.
5. Yashavant Kanetkar, *Let Us C*, bpb Publication (2021).

Minor Paper SEM-II**BCAT-214: Computational Mathematics - II****Course Objectives: Student will be able to ...**

1. Learn relationship between numbers.
2. Study different logical problems.
3. Understand relationship concept.

SYLLABUS:**Credit: 02**

No of Credits : 2	Topic	No. of Hours (30)
Unit I	Matrix	6
	<ul style="list-style-type: none"> • Definition of Matrix, Types of Matrices - Square Matrix, Row Matrix, Column • Matrix, Zero Matrix, Diagonal Matrix, Scalar Matrix, Identity Matrix, Transpose of Matrix, Symmetric Matrix, Skew-symmetric Matrix. • Definition of Determinants of order 2nd and 3rd and their expansions, Minors. • Cofactors, Cramer's Rule singular and nonsingular matrix. • Caley Hamilton Theorem (without proof). 	
Unit II	Algebra of Matrix and Inverse of Matrix	8
	<ul style="list-style-type: none"> • Equality of Matrices, Scalar Multiplication of Matrix, Addition of Matrix, • Subtraction of matrix, Multiplication of matrix, Invertible Matrix, Matrix • Inversion Method, Rank of Matrix, Computation of inverse using definition, • Elementary Rows Transformation, Elementary column Transformation, Inverse of • Matrix (Using Elementary Transformations). 	
Unit III	Graph and Operation on graphs	8
	<ul style="list-style-type: none"> • Introduction, Simple graph, Multi graph, Pseudo Graph, Definition and elementary • Results, Types of graphs: Complete, Regular, Bi-Partite, Complete Bi-partite, • Matrix Representation of Graph: Adjacency and Incidence Matrix, subgraphs and • induced graph, complement of a graph, • Operation on Graph: Union of graph, Intersection of graph, Complement of graph. 	
Unit IV	Connected, Tree and Directed graph	8
	<ul style="list-style-type: none"> • Definitions: Walk, Trail, Path and circuit, Dijkstra's shortest path algorithm, • Definition of Euler's and Hamilton Graph and Example. • Tree Definition, <ol style="list-style-type: none"> 1. Theorem: A tree with n vertices has n -1 edges. 2. Theorem: A connected graph G with n vertices and n – 1, edges is a tree. 	

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|--|---|--|
| | • Definition of Directed graph, Types of directed graphs. | |
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Course Outcomes: Student should be able to ...

1. Use basic mathematical relations and formula.
2. Do problem- solving, Analogies and Analysis.
3. Find the concept of graphs and types of graphs.

REFERENCES:

1. Shantinakaran.,S.Chand and co.delhi., ” *Matrices*” .
2. Raghunathan, Nimkar and solapurkar, “*A first graph Theory*”.
3. Naik and Patil, “*Discrete Mathematics*”, PHADAKE Prakashan.
4. Stephen Boyd, Lieven Vandenberghe (2018), “*Introduction to Applied Linear Algebra*”.
5. Narsing Deo, “*Prentice Graph Theory with Applications to Computer Science and Engineering*”
6. C.L.Liu, “*Elements of Discrete Mathematics*”.
7. K. Somasundaram (2009), “*Graph theory and its applications*”.
8. Joel David Hamkins, (Sept 29,2020) “*Proof and the art of Mathematics*”, The MIT Press.
9. Kolman, Busby, Ross, “*Discrete Mathematical Structures*”, Pearson Education Asia.
10. Trembley, J.P. and Manohar (2007), “*Discrete Mathematical Structures with Applications to Computer Science*”, Tata McGraw Hill, New Delhi.

BCAT-214: Computational Electronic and Hardware - II

Course Objectives: Student will be able to ...

1. Learn Fundamentals of Electronic circuits.
2. Discuss dc and ac circuits.
3. Understand passive filters and rectifiers.
4. Study of computer Networking Devices.

SYLLABUS:

Credit: 02

No of Credits: 2	Topic	No. of Hours (30)
Unit I	Rectifiers and Filters	8
	<ul style="list-style-type: none"> • Introduction • Half wave Rectifier • Full Wave Rectifier • Bridge Rectifier • Filters: C, LC, CLC • Voltage Regulators: 78XX, 79XX. • Design Regulated DC power supply. 	
Unit II	Combinational Circuits	8
	<ul style="list-style-type: none"> • Adder (Half & Full) • Subtractor (Half & Full) • Multiplexer • Demultiplexer, its types • Encoder • Decoder. 	
Unit III	Computational Hardware Devices	8
	<ul style="list-style-type: none"> • Programmable logic devices • Introduction to PLA, PAL, PLD, CPLD, FPGA, ASIC. • Components of computer Networks • HUB • Switch • Repeater • Router • Modem • Server • Bridge • Network Interface Card). 	
Unit IV	Memory Storage Devices	6
	<ul style="list-style-type: none"> • Introduction • Software • Firmware • Motherboard • IO memory expansion slots 	

	<ul style="list-style-type: none">• SMPS, Drives• front panel and rear panel connectors• Primary Storage• Secondary storage• Removable storage• OSI model	
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Course Outcomes: Student should be able to ...

1. Uses of Electronics Circuits.
2. Identify major components of computer system.
3. Compare Hardware and Software.

REFERENCES:

1. Soni.M.L and Gupta.J.C,A ,(1979)course in “*Electrical Circuits Analysis*”,Delhi Dhanpat Rai & Sons.
2. Sze.S.M, (2002) “*Semiconductor Devices*” physics and technology,Wiley India edition,2nd Edition.
3. Rajaraman.V,(1985) “*Fundamental of computer*”New Delhi:Prentics-Hall of India

LAB-IV: BCAP 216: Based on BCAT 214 and BCAT 215**Computational Mathematics - II & Computational Electronic and Hardware - II****Course Objectives: Students will be able to....**

1. Understand Fundamentals of Electronics – hardware
2. Learn How to Design hardware.
3. Understand the basic of logic.
4. Study Digital electronics.
5. Use of different Network devices.
6. Understand Types of Matrices and their applications.

Practical

Credits (Total Credits 2)	SEMESTER - II LAB COURSE – I : BCAP 216 Computational Mathematics – II + Computational Electronic and Hardware – II	No. of hours 60 Hrs.
Computational Mathematics – II		
1	Symmetric and Skew-symmetric Matrix with an Example.	2
2	Examples of Cramer's Rule.	2
3	Inverse of matrix using Elementary Transformation.	2
4	Examples of Rank of matrix.	2
5	Determinant of order 2 nd and 3 rd and their Expansion Examples.	2
6	Find the vertices: Even Vertices, odd vertices, number of edges in graph	2
7	Union of graph, Intersection of graph and degree of vertex with an examples.	2
8	Dijkstra's shortest path algorithm with an examples.	2
Computational Electronic and Hardware – II		
1	Study of half wave rectifier and full wave rectifier	2
2	Design 4:1 multiplexer using gates.	2
3	Study of half adder and full adder.	2
4	Study of half and full subtractor.	2
5	Study of components of computer Networks.	2
6	Demultiplexer using logic gates.	2
7	Study of various types of hard disk drives and preparing them for use.	2
8	To recognize various parts of a computer system.	2
9	Study of various types of memory chips and using them.	2
10	Study the Installation process of Scanner.	2

Course Outcome: Students should be able to....

1. Design and develop rectifier circuit for fixed and variable IC regulators.
2. Use component of computer network.
3. Verify the expressions using Boolean algebra and learn logic gates..
4. Design programs involving decision structures, loops, arrays and functions.
5. Model and solve real world problems using graphs and trees both quantitatively and qualitatively.

Reference Books: -

1. Sedha.R.S. (New Delhi: S Chand Publication,2012) A text of Applied Electronics
2. Thereja.B.L. (New Delhi: S. Chand & Company LTD,2005) Basic Electronics Solid State,
3. Streetman Ben Z and S. Banerjee, (New Delhi: Pearson Education, 2006) Solid State Electronic Devices.
4. Mithal.G.K , (Delhi: Khanna publication,1997)Electronic Devices and Circuits.
5. Shantinarayan.,S.Chand and co.delhi., ” *Matrices*” .
6. K. Somasundaram (2009), “*Graph theory and its applications*”.
7. Trembley, J.P. and Manohar (2007), “*Discrete Mathematical Structures with Applications to Computer Science*”, Tata McGraw Hill, New Delhi.

Open Elective Paper SEM-II

Paper-III : Fundamental of Search Engine Optimization

(30)

Course Objectives: Student will be able to ...

1. Study about SEO.
2. Understand knowledge of basic concepts of cratering SEO.
3. Imbibe different types of Keywords,
4. Study Keyword Research.

SYLLABUS:

Credit: 02

No of Credits: 2	Topic	No of Hours (30)
Unit I	Introduction to SEO	9
	<ul style="list-style-type: none"> • Introduction to SEO • How Search engine works • SEO Phases • History of SEO • How SEO Works • What is Google bot (Google Crawler) • Types Of SEO technique • Keywords • Keyword Planner tools 	
Unit II	On page Optimization	6
	<ul style="list-style-type: none"> • On page Optimization • Technical Elements • HTML tags • Schema.org • RSS Feeds • Microsites • Yoast SEO Plug-in 	
Unit III	Off Page Optimization	9
	<ul style="list-style-type: none"> • Off page Optimization- About Off page optimization • Authority & hubs • Backlink • Blog Posts • Press Release • Forums • Unnatural links. 	
Unit IV	Social Media Reach	6
	<ul style="list-style-type: none"> • Social media Reach- Video Creation & Submission • Maintenance- SEO tactics 	

	<ul style="list-style-type: none">• Google Search Engine• Other Suggested tools.	
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Course Outcomes: Student should be able to ...

1. Analyze the keywords.
2. Writing different content.
3. Aware of different types of SEO.
4. Apply Basic SEO.

REFERENCES:

1. The Art of SEO was written by three authors: Eric Enge, Stephan Spencer, and Jessie C. Stricchiola.
2. SEO 2021 by Adam Clarke

Paper-IV : Web Analytics**(30)****Course Objectives: Student will be able to ...**

1. Study optimizing an organization's digital ecosystem by collecting.
2. Analyzing and enabling the making of data-informed decisions.
3. Imbibe different types of analytics tools.

SYLLABUS:**Credit: 02**

No of Credits: 2	Topic	No of Hours (30)
Unit I	Introduction web analytics	6
	<ul style="list-style-type: none"> • Introduction analysis • Small businesses • Medium and Large scale businesses • Analysis vs intuition • Introduction to web analytic 	
Unit II	Google Analytics	8
	<ul style="list-style-type: none"> • Getting Started With Google Analytics • Google Analytics works • Accounts, profiles, and users navigating Google Analytics • Basic metrics • The main sections of Google Analytics reports Traffic Sources Direct, referring, and search traffic Campaigns AdWords • AdSense. 	
Unit III	Content Performance Analysis	8
	<ul style="list-style-type: none"> • Pages and Landing Pages • Event Tracking and AdSense • Site Search • Visitor Analysis- Unique visitors, Geographic and language information • Technical reports • Benchmarking 	
Unit IV	Social Media Analytics	8
	<ul style="list-style-type: none"> • Facebook insights • Twitter analytics • YouTube analytics • Social Ad analytics /ROI measurement • Goals and E-Commerce Tracking- Setting up goals Goal reports • Ecommerce tracking • Actionable Insights & The Big Picture-Recap of Google Analytics reports and tools • Finding actionable insights • Getting the organization involved • Creating a data-driven culture • Resources Common mistakes analysts make Additional Web analytics tools. 	

Course Outcomes: Student should be able to ...

1. Make Google analytics.
2. Making google analytics profile.
3. Tracking the AdSense Event.
4. Use analytics in social media.

REFERENCES:

1. Practical Web Analytics for User Experience, How Analytics Can Help You Understand Your Users, By Michael Beasley · 2013
2. Advanced Web Metrics with Google Analytics By Brian Clifton · 2010

Paper-III and IV LAB-II**Fundamental of Search Engine Optimization and Web Analytics****Course Objectives: Students will be able to....**

1. Understand different Meta tag.
2. Learn Key Word writing.
3. Study the google analytics concept.
4. Understand google analytics profile creating.

Credits (Total Credits 2)	SEMESTER - II LAB COURSE – I : Fundamental of Search Engine Optimization + Web Analytics	No. of hours 60 Hrs.
1	Create simple Meta Titles.	2
2	Write Meta Descriptions with 4 examples.	2
3	Write Heading Tags in different keyword.	2
4	Add five Element in two different site.	2
5	Create Google analytics account.	2
6	Track any 2 websites analytics record.	2
7	Add google add sense in Website.	2
8	Use SEO tools and create top keyword on your college website.	2
9	Begin the title of your home page with your Primary Keyword Phrase, followed by your best Secondary Keyword Phrases.	2
10	Make sure the <title> tag is the first element in the <head> section of your page - this makes it easier for Google to find the page.	2
11	Visitor Analysis of two website.	2
12	Add google add sense in Website.	2
13	Make google analytics account and track 5 website.	2
14	Create hotel website in best 10 keyword	2
15	Create your college best 10 keywords.	2

Course Outcome: Students should be able to....

1. Writing keyword in website.
2. Using various SEO tools.
3. Crate google analytics profile
4. Tracking the analyses report.

Reference Books: -

1. Digital Marketing –Kamat and Kamat-Himalaya
2. Marketing Strategies for Engaging the Digital Generation, D. Ryan,
3. Digital Marketing, V. Ahuja, Oxford University Press