# THE MAHATMA GANDHI UNIVERSITY

## Bachelor in Computer Applications (Honours)

## SYLLABUS

# MGU-BCA (Honours)

## (2024 Admission Onwards)

## Faculty: Technology and Applied Sciences

## Expert Committee: Computer Application (UG)

## Programme: Bachelor in Computer Applications (Honours)

**Mahatma Gandhi University**
**Priyadarshini Hills**
**Kottayam – 686560, Kerala, India**

# Contents

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|---|---|
| **External Experts** | |
| **1** | **Prof. (Dr.) Bindu V R**, Professor and Head, School of Computer Sciences, Mahatma Gandhi University, Kottayam |
| **2** | **Prof. (Dr.) Sabu M K**, Professor, Department of Computer Applications, Cochin University of Science and Technology, Kochi |
| **Members of the Expert Committee in Computer Application (UG)** | |
| **1** | **Dr. Rajimol A,** Associate Professor, Department of Computer Applications, Marian College Kuttikkanam (Autonomous), Kuttikkanam (Chairperson UG Board) |
| **2** | **Dr. Ajitha R S,** Assistant Professor, Department of Computer Applications, NSS College, Rajakumari |
| **3** | **Mr. Bineesh Jose,** Assistant Professor, Department of Computer Applications, Pavanatma College, Murickassery |
| **4** | **Dr. Reji K Kollinal,** Assistant Professor, Department of Computer Applications, BPC College, Piravom |
| **5** | **Ms. Simi M,** Associate Professor, Department of Computer Applications, SAS SNDP Yogam College, Konni |
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| **8** | **Dr. Leena C Sekhar,** Associate Professor, Department of Computer Applications, MES College, Marampally |
| **9** | **Dr. Juby George,** Assistant Professor, Department of Computer Applications, Marian College, Kuttikkanam |
| **10** | **Dr. Sowmya M R,** Assistant Professor, Department of Computer Science, Sree Sankara College, Kalady |
| **11** | **Mr. Biju Kumar S P,** Assistant Professor, Department of Computer Applications, NSS College Rajakumari, Idukki (Dist) |

| First Semester | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Course Code | Title of the Course | Type of the Course . | Credit | Hours / week | Hour Distribution /week | | | |
| | | | | | L | T | P | O |
| MG1DSCBCA100 | Fundamentals of Programming using C | DSC | 4 | 4 | 4 | 0 | 0 | 0 |
| MG1DSCBCA101 | Digital Fundamentals | DSC | 4 | 4 | 4 | 0 | 0 | 0 |
| MG1DSCBCA102 | Software lab in C | DSC | 2 | 4 | 0 | 0 | 4 | 0 |
| MG1DSCBCA103 | Discrete Mathematics | DSC | 4 | 4 | 4 | 0 | 0 | 0 |
| MG1MDCBCA100 | Cyber Laws and Online Safety | MDC | 3 | 3 | 3 | 0 | 0 | 0 |
| | AEC- ENGLISH | AEC 1 | 3 | 3 | 3 | 0 | 0 | 0 |
| | AEC-OL | AEC 2 | 3 | 3 | 3 | 0 | 0 | 0 |

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| **Programme** | **BCA (Honours)** | | | | | |
| **Course Name** | **Fundamentals of Programming Using C** | | | | | |
| **Type of Course** | **DSC** | | | | | |
| **Course Code** | MG1DSCBCA100 | | | | | |
| **Course Level** | **100** | | | | | |
| **Course Summary** | This course covers fundamental concepts in computer programming, including algorithms, flowcharts, programming languages, control flow structures, arrays, and functions, emphasizing practical implementation through a series of hands-on exercises. Students will gain proficiency in solving problems using the C programming language. | | | | | |
| **Semester** | 1 | Credits | | | 4 | Total Hours |
| **Course Details** | Learning Approach | Lecture | Tutorial | Practical | Others | |
| | | 4 | 0 | 0 | 0 | 60 |
| **Pre-requisites, if any** | | | | | | |

## COURSE OUTCOMES (CO)

| CO No. | Expected Course Outcome | Learning Domains * | PO No |
|---|---|---|---|
| 1 | Demonstrate basic programming concepts. | U | 1 |
| 2 | Understand C Programming Basics such as Datatypes and Variables, Different types of operators. | U | 2 |
| 3 | Devise C programs using the concept of Decision statements and loop control statements. | An | 2 |
| 4 | Apply logic to use arrays and functions in C Programming Language. | A | 1 |

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

## COURSE CONTENT

### Content for Classroom transactions (Units)

| Module | Units | Course description | Hrs | CO No. |
|---|---|---|---|---|
| 1 | 1.1 | Problem Solving Life Cycle – Understanding the Problem Statement, Analysing the problem,<br>Planning Program design using Hierarchy charts, Top-down approach, Bottom-up approach.<br>Understanding basic Problem-Solving Tools: Algorithms: Definition & its attributes, Flowchart: Definition & its attributes, symbols, Statements: Input-Output, Decision-Making &Looping, Module representation | 6 | 1 |
| | 1.2 | **Introduction to Programming:** Computer program. Classification of computer languages: machine, assembly and high-level languages, Language translators (Assembler, Compiler, Interpreter), Linker, Testing and debugging, | 4 | 1 |
| | 1.3 | Types of errors- Syntax errors, Logical errors and Runtime errors. | 2 | 1 |
| 2 | 2.1 | C Character Set, Delimiters, Types of Tokens, C Keywords, Identifiers, Constants, Variables, Rules for defining variables, | 2 | 2 |
| | 2.2 | Data types, C data types, Declaring and initialization of variables, Type modifiers, Type conversion, Operators and Expressions- | 5 | 2 |
| | 2.3 | Properties of operators, Priority of operators, Comma and conditional operator, Arithmetic operators, Relational operators, | 3 | 2 |
| | 2.4 | Assignment operators and expressions, Logical Operators, Bitwise operators. | 4 | 2 |
| 3 | 3.1 | Input and Output in C – Formatted functions, unformatted functions, commonly used library functions, | 5 | 3 |
| | 3.2 | Decision Statements If, if-else, nested if-else, if-else-if ladder, break, continue, goto, switch, nested switch, switch case and nested if. | 6 | 3 |
| | 3.3 | Loop control- for loops, nested for loops, while loops, do while loop. | 6 | 3 |
| 4 | 4.1 | Array, initialization, array terminology, characteristics of an array, one dimensional array and operations, | 5 | 4 |

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|---|---|---|---|---|
| | 4.2 | Two dimensional arrays and operations. Strings and standard functions, Introduction to pointers.<br>Basics of a function, function definition, return statement, | 6 | 4 |
| | 4.3 | Types of functions, call by value and reference. Recursion - Rules for recursive function, Advantages and disadvantages of recursion. Storage class, Structure and union, Features of structures, Declaration and initialization of structures, typedef, enumerated data types, Union. | 6 | 4 |
| 5 | | Teacher Specific Module | | |

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| **Teaching and Learning Approach** | **Classroom Procedure (Mode of transaction)**<br>• Use of ICT tools in conjunction with traditional classroom teaching methods<br>• Interactive sessions<br>• Class discussions |
| **Assessment Types** | **MODE OF ASSESSMENT**<br>**A. Continuous Comprehensive Assessment (CCA)**<br>**CCA for Theory: 30 Marks**<br>1. Written tests<br>2. Assignments<br>3. Quiz |
| | **B. Semester End Examination**<br>**ESE for Theory: Written Test (70 Marks, 2 Hrs)**<br>Part A: Very Short Answer Questions (Answer all) - (10*2=20 Marks)<br>Part B: Short Answer Questions (5 out of 7 Questions) - (5*6=30 Marks)<br>Part C: Essay Questions (2 out of 3 Questions) - (2*10=20 Marks) |

**REFERENCES**

1. Balagurusamy, E. (2019), “Programming in ANSI C” (8th ed.), Tata McGraw Hill.

2. Hanly J. R. and Koffman E. B. (2007), “Problem Solving and Program Design in C” (7th ed.), Pearson Education.

**SUGGESTED READINGS**

1. Gottfried, B. S. (2018). “Programming with C" (4th ed.). Schaum’s Outline Series, TMH.

2. Pradeep K. Sinha and Priti Sinha (2004), “Computer Fundamentals -Concepts, Systems & Applications”, 8th Edition, BPB Publications.

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|---|---|---|---|---|---|---|
| **Programme** | BCA (Honours) | | | | | |
| **Course Name** | **Digital Fundamentals** | | | | | |
| **Type of Course** | DSC | | | | | |
| **Course Code** | MG1DSCBCA101 | | | | | |
| **Course Level** | 100 | | | | | |
| **Course Summary** | This course covers the fundamentals of digital electronics, including number systems, Boolean algebra, logic gates, combinational logic circuits, and sequential logic circuits. Students gain a comprehensive understanding of digital logic design principles and their applications Through theoretical concepts and practical examples. | | | | | |
| **Semester** | 1 | Credits | | | 4 | Total Hours |
| **Course Details** | Learning Approach | Lecture | Tutorial | Practical | Others | |
| | | 4 | 0 | 0 | 0 | 60 |
| **Pre-requisites, if any** | | | | | | |

## COURSE OUTCOMES (CO)

| CO No. | Expected Course Outcome | Learning Domains * | PO No |
|---|---|---|---|
| 1 | Demonstrate comprehension of number systems. | U,A | 2 |
| 2 | Analyse working of logic gates, solve expressions using laws of Boolean algebra. | An,A | 1,2 |
| 3 | Illustrate the combinational logic circuits using multiplexers, demultiplexers and other circuits | U,An | 1,3 |
| 4 | Design sequential circuits using flip flops and registers | An,A | 1,2 |

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

**COURSE CONTENT**

**Content for Classroom transactions (Units)**

| Module | Units | Course description | Hrs | CO No. |
|---|---|---|---|---|
| 1 | 1.1 | Number Systems, Introduction – Base or radix, Non-positional and Positional number system, Popular number systems (Decimal, Binary, Octal and Hexadecimal), Conversion-From one number system to another, Concept of binary addition and subtraction, 1's Complement, 2's complement. | 8 | 1 |
| | 1.2 | BCD numbers- concept and 8421 additions | 2 | 1 |
| 2 | 2.1 | Logic gates- AND, OR, NOT, NAND, NOR, XOR and XNOR. Truth tables and graphical representation. | 5 | 2 |
| | 2.2 | Basic laws of Boolean Algebra, Simplification of Expressions, DeMorgan's theorems, | 5 | 2 |
| | 2.3 | Dual expressions, Canonical expressions. Minterms and Maxterms, SOP and POS expressions | 4 | |
| | 2.4 | Simplification of expressions using K-MAP (up to 4 variables) | 5 | 2 |
| | 2.5 | Representation of simplified expressions using NAND/NOR Gates, Don't care conditions | 4 | 2 |
| 3 | 3.1 | Combinational Logic Circuits: Adders-Half adder, Full adder | 7 | 3 |
| | 3.2 | Encoders, Decoders (Diagram and working principle) | 5 | 3 |
| | 3.3 | Multiplexers, Demultiplexers (Diagram and working principle) | 5 | 3 |
| 4 | 4.1 | Sequential Logic Circuits: Flip flops- RS, JK, T, D, Triggering of flip flops, Concept of Registers | 10 | 4 |
| 5 | | Teacher specific content | | |

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| **Teaching and Learning Approach** | **Classroom Procedure (Mode of transaction)**<br>• ICT enabled Lectures<br>• Interactive sessions<br>• Class discussions |

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| **Assessment Types** | **MODE OF ASSESSMENT**<br>**A. Continuous Comprehensive Assessment (CCA)**<br><br>**CCA for Theory: 30 Marks**<br><br>1. Written tests<br>2. Quiz<br>3. Assignments |
| | **B. Semester End Examination**<br><br>**ESE for Theory: 70 Marks; Written Test (2 Hrs)**<br><br>Part A: Very Short Answer Questions (Answer all) - (10*2=20 Marks)<br>Part B: Short Answer Questions (5 out of 7 Questions) - (5*6=30 Marks)<br>Part C: Essay Questions (2 out of 3 Questions) - (2*10=20 Marks) |

**REFERENCES**


1. M Morris Mano. Digital Logic and Computer Design (4th Edition). Prentice Hall.
2. A. Anand Kumar (2018). Fundamentals of Digital Circuits (4th Edition). PHI Learning Pvt. Ltd.


**SUGGESTED READINGS**


1. Thomas C Bartee- Digital computer Fundamentals, Sixth Edition, TATA McGraw Hill Edition
2. Thomas L Floyd- Digital Fundamentals, Ninth edition, PEARSON Prentice Hall.
3. Malvino & Leach- Digital Principles and Applications, Sixth Edition, Tata McGraw Hill, 2006

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# Kottayam

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| **Programme** | **BCA (Honours)** | | | | | |
| **Course Name** | **Software Lab in C** | | | | | |
| **Type of Course** | **DSC** | | | | | |
| **Course Code** | MG1DSCBCA102 | | | | | |
| **Course Level** | **100** | | | | | |
| **Course Summary** | This course covers problem solving using C Programming, Practical Implementation of Problems using different types of C statements such as control flow structures, loop control structures, arrays, and functions. Students will gain proficiency in solving problems using the C programming language. | | | | | |
| **Semester** | First | Credits | | | 2 | Total Hours |
| **Course Details** | Learning Approach | Lecture | Tutorial | Practical | Others | |
| | | 0 | 0 | 4 | 0 | 60 |
| **Pre-requisites, if any** | | | | | | |



## COURSE OUTCOMES (CO)

| CO No. | Expected Course Outcome | Learning Domains * | PO No |
|---|---|---|---|
| 1 | Develop programs to solve various problems using different types of C statements such as control flow structures, loop control structures, arrays, and functions. | A | 1 |

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

**COURSE CONTENT**

**Content for Lab Sessions (Units)**

| Module | Units | Course description | Hrs | CO No. |
|---|---|---|---|---|
| 1 | 1.1 | Programs to understand the use of Datatypes and variables. | 3 | 1 |
| | 1.2 | Programs to use different Operators and Type Conversions | 5 | 1 |
| 2 | 2.1 | Programs to Apply Input and Output in C, understand Library functions | 7 | 1 |
| | 2.2 | Program to implement Control structures in C | 10 | 1 |
| | 2.3 | Programs to Implement Loop Control Structures in C | 10 | 1 |
| 3 | 3.1 | Programs to Implement Arrays: One-dimensional and Two-dimensional Arrays | 10 | 1 |
| 4 | 4.1 | Program to implement problems using Functions, Recursion and different parameter Passing Methods. | 15 | 1 |
| 5 | | Teacher Specific Module | | 1 |



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| **Teaching and Learning Approach** | **Classroom Procedure (Mode of transaction)**<br>• Practical Lab Sessions<br>• Discussions |
| **Assessment Types** | **MODE OF ASSESSMENT**<br>**A. Continuous Comprehensive Assessment (CCA)**<br>**CCA for Practical: 30 Marks**<br>1. Written tests<br>2. Lab Assessment<br>3. Viva<br>4. Record |

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| | **B. Semester End Examination**<br>**ESE for Practical: 70 Marks (2.5 Hrs)**<br>**Lab Examination Test: 70 Marks**<br>1. First Program: 20 Marks<br>2. Second Program: 30 Marks<br>3. Viva Voce: 10 Marks<br>4. Record: 10 Marks |

**REFERENCES**


1. Balagurusamy, E. (2019), "Programming in ANSI C" (8th ed.), Tata McGraw Hill.
2. Hanly J. R. and Koffman E. B. (2007), "Problem Solving and Program Design in C" (7th ed.), Pearson Education.


**SUGGESTED READINGS**


1. Gottfried, B. S. (2018). "Programming with C" (4th ed.). Schaum's Outline Series, TMH.
2. Pradeep K. Sinha and Priti Sinha (2004), "Computer Fundamentals -Concepts, Systems & Applications", 8th Edition, BPB Publications.

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| | **Mahatma Gandhi University**<br>**Kottayam** |
| **Programme** | **BCA (Honours)** |
| **Course Name** | **Discrete Mathematics** |
| **Type of Course** | DSC |
| **Course Code** | MG1DSCBCA103 |
| **Course Level** | **100** |
| **Course Summary** | This course introduces basic concepts of Set Theory, Logic, Relations, functions and Matrices. The Basic ideas of Sets and Propositional Logic are further expanded. Mathematical Significance of Relations and functions are explained. Various mathematical manipulations involved in Matrices are properly illustrated. Students acquire skills in applying concepts in Propositional Logic and Relations in different branches of computer science. |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Semester** | 1 | Credits | | | 4 | Total Hours |
| **Course Details** | Learning Approach | Lecture | Tutorial | Practical | Others | |
| | | 4 | 0 | 0 | 0 | 60 |
| **Pre-requisites, if any** | Nil | | | | | |



## COURSE OUTCOMES (CO)

| CO No. | Expected Course Outcome | Learning Domains * | PO No |
|---|---|---|---|
| 1 | Understand Concepts of Set Theory | U | 1 |
| 2 | Evaluate problems on Set theory. | E | 2 |
| 3 | Understand Propositional Logic. | U | 2 |
| 4 | Identify and Apply Propositional Logic. | A | 3 |
| 5 | Evaluate problems using Truth tables and Logical operators. | E | 3 |
| 6 | Understand And Analyse different types and properties of Relations, functions and Equivalence Relations. | An | 2 |
| 7 | Understand concepts of Matrix and Matrix Operators. | U | 2 |

| | | | |
|---|---|---|---|
| 8 | Evaluate the Inverse of a Matrix and solution of a system of Non homogeneous Equations | E | 2 |

***Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)***

## COURSE CONTENT

### Content for Classroom transactions (Units)

| Module | Units | Course description | Hrs | CO No. |
|---|---|---|---|---|
| 1 | Logic and Proofs | | | |
| | 1.1 | Propositional Logic (1.1 of Text 1) | 5 | 3 |
| | 1.2 | Propositional Equivalences (1.2 of Text 1) | 5 | 4 |
| | 1.3 | Rules of Inferences for Propositional Logic (Relevant portions of 1.5 of Text 1) | 5 | 5 |
| 2 | Set Theory | | | |
| | 2.1 | Sets (2. 1 of Text 1) | 4 | 1 |
| | 2.2 | Set operations. (2. 2 of Text 1) | 4 | 2 |
| | 2.3 | Functions ( 2. 3 of Text 1) | 4 | 6 |
| 3 | Relations | | | |
| | 3. 1 | Relations and their Properties ( 7. 1 of Text 1) | 6 | 6 |
| | 3. 2 | Representing relations (7.3 of Text 1) | 6 | 6 |
| | 3. 3 | Equivalence relations (7.5 of Text 1) | 5 | 6 |
| 4 | Matrices | | | |
| | 4. 1 | Definition and different types of Matrices, Symmetric and Skew Symmetric Matrices (2.5 of Text 2) | 3 | 7 |
| | 4. 2 | Matrix operations, Determinant, Matrix inverse (2.6 , Relevant portions of 2.7 of Text 2) | 8 | 7 & 8 |
| | 4.3 | Solution of a system of Non homogeneous equations by Matrix method and Cramer's rule (Relevant portions of 2.7, 2.10 of Text 2) | 5 | 8 |

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| 5 | | Teacher Specific Module | | |

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| **Teaching and Learning Approach** | **Classroom Procedure (Mode of transaction)**<br>Brainstorming lectures, Explicit teaching, Active Cooperative learning | | | | | |
| **Assessment Types** | **MODE OF ASSESSMENT** | | | | | |
| | **A** | **Continuous Comprehensive Assessment (CCA) (30 marks)** | | | | |
| | | 1. Quiz / MCQ<br>2. Assignment<br>3. Tests<br>4. Tutorial | | | | |
| | **B** | **End Semester Evaluation (ESE) 70 marks** | | | | |
| | | **Question Pattern**<br>**[Maximum Time 2 Hours, Maximum Marks 70]** | | | | |
| | | **Module** | **Part A**<br>**2 Marks** | **Part B**<br>**6 Marks** | **Part C**<br>**10 Marks** | **Total** |
| | | I | 2 | 2 | 2 | 6 |
| | | II | 2 | 2 | 1 | 5 |
| | | III | 2 | 2 | 1 | 5 |
| | | IV | 2 | 2 | 2 | 6 |
| | | Total no of questions | 8 | 8 | 6 | 22 |
| | | Number of questions to be answered | 5 | 5 | 3 | 13 |
| | | Total Marks | 10 | 30 | 30 | 70 |



**REFERENCES**

1. Kenneth. H. Rosen - Discrete Mathematics and its applications, 6th edition
2. B.S Grewal - Higher Engineering Mathematics, 40th Edition, Khanna Publications

**SUGGESTED READINGS**

1. Erwin Kreyszig - Advanced Engineering Mathematics, Wiley, India.
2. S.S Sastry - Engineering Mathematics Volume 1, 4th edition PHI.

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| | **Mahatma Gandhi University**<br>**Kottayam** |
| **Programme** | **BCA (Honours)** |
| **Course Name** | **Cyber Laws and Security** |
| **Type of Course** | MDC |
| **Course Code** | MG1MDCBCA100 |
| **Course Level** | 100 |
| **Course Summary** | This comprehensive course on Cyber Laws and Security is designed to provide participants with a thorough understanding of cyber laws, including the IT Act, data protection, and regulations related to cybercrimes, cyberbullying, and harassment, along with internet security practices. It also provides a foundational understanding of cryptography, cyber forensics, and ethical hacking principles to enhance knowledge in securing digital information and systems. |

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|---|---|---|---|---|---|---|
| **Semester** | 1 | Credits | | | 3 | Total Hours |
| **Course Details** | Learning Approach | Lecture | Tutorial | Practical | Others | |
| | | 3 | 0 | 0 | 0 | 45 |
| **Pre-requisites, if any** | | | | | | |

## COURSE OUTCOMES (CO)

| CO No. | Expected Course Outcome | Learning Domains * | PO No |
|---|---|---|---|
| 1 | Describe cyber laws, IT Act, data protection and various cybercrimes. | U | 1 |
| 2 | Analyze and apply security measures during online transactions and financial activities. | An | 1 |
| 3 | Illustrate basic cryptographic techniques and importance of cyber forensic. | U | 2 |

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

## COURSE CONTENT

### Content for Classroom transaction (Units)

| Module | Units | Course description | Hrs | CO No. |
|---|---|---|---|---|
| 1 | Cyber Laws, IT Act and Cyber Crimes | | | |
| | 1.1 | Introduction to Cyber laws: Definition and Scope, Key legal concepts in cyberspace. | 2 | 1 |
| | 1.2 | IT Act: Overview of the IT Act 2000, Offenses and penalties under the IT Act, Amendments and evolving landscape. | 4 | 1 |
| | 1.3 | Data Protection and Privacy Laws : Principles of Data Protection, Privacy laws and regulations. | 3 | 1 |
| | 1.4 | Cyber Crimes: Types of Cybercrimes, Hacking and unauthorized access, Identity theft and cyber fraud. | 4 | 1 |
| | 1.5 | Cyber Bullying and Harassment: Definition and Forms of Cyber Bullying, Legal Perspective on Cyberbullying. | 4 | 1 |
| | 1.6 | Harassment Laws and social media, Reporting and preventing cyberbullying. | 3 | 1 |
| 2 | Online Security | | | |
| | 2.1 | Introduction to Internet Security: Overview of Internet Security, Importance of Online Safety. | 2 | 2 |
| | 2.2 | Passwords and Authentication: Importance of Strong Password, Multi Factor Authentication (MFA). | 2 | 2 |
| | 2.3 | Secure Browsing Practices: Recognizing and Avoiding phishing Attacks, Identifying Secure Websites (HTTPS). | 3 | 2 |
| | 2.4 | Social Media Security: Privacy settings on Social media platforms, Secure sharing information. | 2 | 2 |
| | 2.5 | Online Transaction and Financial Security: Secure online shopping, Banking and Financial Security, Payment Card safety. | 2 | 2 |
| 3 | Introduction to Cryptography and Cyber Forensics | | | |
| | 3.1 | Security Concepts: Introduction, The need for security, Principles of security, Types of Security attacks | 3 | 3 |

| | | | | |
|---|---|---|---|---|
| | 3.2 | Cryptography Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, | 4 | 3 |
| | 3.3 | Encryption and decryption, symmetric and asymmetric key cryptography | 3 | 3 |
| | 3.4 | Introduction to Cyber forensics - Definition and importance of cyber forensics, Types of cybercrime -hacking, phishing, identity theft, etc., The role of forensics in investigating cybercrime. Introduction to Ethical Hacking. | 4 | 3 |
| 4 | | Teacher Specific Content | | |

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| **Teaching and Learning Approach** | **Classroom Procedure (Mode of transaction)**<br><br>Lectures, Discussions, Case Analysis |
| **Assessment Types** | **MODE OF ASSESSMENT**<br>**A. Continuous Comprehensive Assessment (CCA)**<br><br>**CCA for Theory: 25 Marks**<br><br>1. Written test<br>2. Assignments<br>3. MCQ |
| | **B. Semester End Examination**<br>**ESE for Theory: 50 Marks (1.5 Hrs)**<br><br>**Written Test (50 Marks)**<br>Part A: Very Short Answer Questions (Answer all) - (10*2=20 Marks)<br>Part B: Short Answer Questions (6 out of 8 Questions) - (6*5=30 Marks) |

**REFERENCES:**


1. Vakul Sharma, "Information Technology Law and Practice", 3rd ed. 2011, Universal Law Pub., New Delhi.

2. Adv. Prashant Mali, "Cyber Law & Cyber Crimes", Snow White Publications Pvt. Ltd, 2nd ed. 2015.

3. Michael Cross , "Social Media Security: Leveraging Social Networking While Mitigating Risk", Elsevier, 2014.

4. William Stallings & Lawrie Brown " Computer Security – Principles and Practice" 3rd ed., Pearson Pub., 2017.

5. William Stallings, Cryptography and Network Security Principles and Practice, 4/e,Pearson Ed.

6. Cyber Forensics - Concepts and Approaches, Ravi Kumar & B Jain,2006, icfai university press


**SUGGESTED READINGS:**


1. "Cyber Law in India" by Pavan Duggal
2. "Cyber Security: A Practitioner's Guide" by Eric Cole
3. "Principles of Intellectual Property" by Stephen M McJohn
4. "The Indian Cyber Law" by Sandeep Agrawal