MahakaushalUniversity, Jabalpur (M.P.)

2021-22

Course Code : BSC(CYBER SECURITY)

Duration of Course: 3 Years

Examination Mode: Year Examination

System: Non Grading

Mahakaushal University
Village-Aithakheda,MukunwaraRoad,Post-Tilwara
Jabalpur(M.P.)482003

MahakaushalUniversity,Jabalpur (M.P.)

Class : B.A./B.Sc./B.Com./BBA/BCA/B.A---**I Year**
Subject : Foundation Course
Paper : I
Paper Name : (Hindi Language & Moral Values) –I
Paper code : FC101-T

Particulars

Unit-I	हिन्दीभाषा स्वतंत्रतापुकारती (कविता) – जयशंकरप्रसादपुष्प की अभिलाषा (कविता) –माखनलालचतुर्वेदी वाक्य संरचनाऔरअशुद्धियां (संकलित)
Unit-II	हिन्दीभाषा नमककादरोगा (कहानी) –प्रेमचंद एक थेराजाभोज (निबंध) –डॉ त्रिभुवननाथ शुक्ल पर्यायवाची, विलोम, एकार्थी, अनेकार्थी एवं शब्दयुग्म शब्द (संकलित)
Unit-III	हिन्दीभाषा भगवानबुद्ध (निबंध) –स्वामीविवेकानंद लोकतंत्र एक धर्महै (निबंध) –डॉ. सर्वपल्लीराधाकृष्णन नही रूकतीहै नदी –हीरालालबाछौतिया पल्लवन
Unit-IV	हिन्दीभाषा अफसर (निबंध) – शरदजोशी हमारीसांस्कृतिक एकता (निबंध) –रामधारी सिंह दिनकर (एक भारतश्रेष्ठभारत के अन्तर्गत) संक्षेपण (संकलित)
Unit-V	नैतिकमूल्य नैतिकमूल्य परिचय एवंवर्गीकरण (आलेख) –डॉ. शशिराय आचरण की सभ्यता (निबंध) –सरदारपूर्णसिंह अंतर्ज्ञानऔरनैतिक जीवन (लेख) –स्वामी श्रद्धानंद

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Class : B.A./B.Sc./B.Com./BBA/BCA/B.A---**I Year**
Subject : Foundation Course
Paper : II
PaperName: EnglishLanguage-I
Paper code : FC102-T

Particulars

Unit-I	WherethemindiswithoutfearRabindranathTagore.The Hero: R.K. Narayan. TrystwithDensityJawaharlaalNehru.In dianweavers:SarojniniNaidu. Theportraitofalady:KhushwantSingh. TheSolitaryReaper:Willian Wordsworth.
Unit-II	BasicLanguageSkills:Vocabulary,Synonyms, Antonyms,Wordformation, PrefixesSuffixes.
Unit-III	BasicLanguageSkills:Uncountablenouns,verbs,tenses,adverbs.
Unit-IV	Comprehension/UnseenPassage.
Unit-V	CompositionandParagraphwriting.

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Class : B.A./B.Sc./B.Com./BBA/BCA/B.A---**I Year**
Subject : Foundation Course
Paper : III
Paper Name : (Entrepreneurship Development)
Paper code : FC103-T

Particulars

Unit-I	EntrepreneurshipDevelopment -Conceptandimportance, functionofenterpriser, Goaldetermination-ProblemsChallenges andsolutions.
Unit-II	Project Proposal - need and Objects – Nature of organization, ProductionManagement,FinancialManagement,MarketingManagement,C onsumer Management.
Unit-III	RoleofregulatoryInstitutions,RoleofdevelopmentOrganizationsandself employmentorientedschemes,Various growthschemes.
Unit-IV	FinancialManagementforProject–Financialinstitutionandtheirrole,Capital estimationandarrangement,costandpricedetermination,accountingmanagement
Unit-V	Problemofentrepreneur–Problemrelatingcapital,ProblemrelatingRegistration, administrationproblemandhowtoovercome

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BCYS101-T

Introduction to cyber security

UNIT-I **Marks-10**

BasicsofCyber Security:-Introduction to Cyber Security - Importance and challenges in Cyber Security- Cyberspace - Cyber threats - Cyber warfare - CIA Triad - Cyber Terrorism- Cyber Security of Critical Infrastructure - Cyber security -Organizational Implications.

UNIT-II **Marks-10**

Vulnerability in Cyber Space and Security:-Types of Hackers- Hackers and Crackers - Cyber-Attacks and Vulnerabilities- Malware threats- Sniffing - Gaining Access - Hiding Files - Covering Tracks- Worms - Trojans- Viruses- Backdoors. Vulnerabilities- Overview, Vulnerabilities in Software, System administration, Threat Actors, Attacks, Open Access to Organizational Data, Weak Authentication, Unprotected Broadband communications. Cyber Security Safeguards- Overview, Access control, Audit, Authentication, Biometrics, Cryptography, Deception, Denial of Service Filters, Ethical Hacking, Firewalls, Intrusion Detection Systems, Response, Scanning, Security policy, Threat Management.

UNIT-III **Marks-10**

EthicalHackingandSocialEngineering:-Ethical Hacking Concepts and Scopes- Threats and Attack Vectors - Information Assurance- Threat Modeling- Enterprise Information Security Architecture- Vulnerability Assessment and Penetration Testing- Types of Social Engineering- Insider Attack- Preventing Insider Threats- Social Engineering Targets andDefence Strategies.

UNIT-IV **Marks-10**

CyberForensicsandAuditing:-Introduction to Cyber Forensics- Computer Equipment and associated storage media- Role of forensics Investigator- Forensics Investigation Process - Collecting Network based Evidence- Writing Computer Forensics Reports - Auditing – Plan an audit against a set of audit criteria- Information Security Management System Management. Introduction to ISO 27001:2013.

UNIT-V **Marks-10**

ArchitectureofCyberspace:-DefiningCyberspaceandOverviewofComputerand Web-technology, Architectureofcyberspace,Complex NetworArchitectures, Internet,Worldwideweb,Advent of internet, Internet infrastructurefor data transfer and governance, Internetsociety,Regulationofcyberspace,Conceptofcybersecurity,Issuesandchallengesofcyber security.

Reference Books:

Donaldson, S., Siegel, S., Williams, C.K., and Aslam, A. (2015). ―Enterprise Cyber security -How to Build a Successful Cyber defense Program against Advanced Threats‖, Apress, 1st Edition. Franke, Don Cyber Security Basics: Protect your organization … (Paperback) Nina Godbole, SumitBelapure, (2011). ―Cyber Security‖, Willey. Roger Grimes, ―Hacking the Hacker‖, Wiley, 1st Edition, 2017. Yuri Diogenes and ErdalOzkaya (2018). Cyber security– Attack and Defense Strategies: 2nd Edition Paperback. L: Lecture T: Tutorial P: Practical C: Credits

MahakaushalUniversity,Jabalpur (M.P.)

BCYS101-P cyber security LAB

Network Traffic Analysis

- **Description**: Learn to analyze network traffic to detect and respond to security threats.
- **Practical Activities**: Using tools like Wireshark or Zeek to capture and analyze network packets, identifying suspicious activities, and investigating security incidents.

2. Vulnerability Assessment and Penetration Testing (VAPT)

- **Description**: Identify vulnerabilities in systems and networks and assess their potential impact.
- **Practical Activities**: Conducting vulnerability scans using tools like Nessus or OpenVAS, performing penetration tests to exploit vulnerabilities, and providing recommendations for remediation.

3. Security Information and Event Management (SIEM)

- **Description**: Deploy and configure SIEM solutions to centralize and analyze security event logs.
- **Practical Activities**: Setting up SIEM platforms like Splunk or Elastic SIEM, configuring log sources, creating correlation rules, and generating security reports.

4. Incident Response and Forensics

- **Description**: Develop incident response plans and forensic techniques to investigate security incidents.
- **Practical Activities**: Creating incident response playbooks, conducting digital forensic investigations using tools like Autopsy or The Sleuth Kit, and preserving evidence for legal purposes.

5. Secure Coding Practices

- **Description**: Learn secure coding principles to prevent common software vulnerabilities.
- **Practical Activities**: Reviewing and analyzing code for security vulnerabilities using static analysis tools like SonarQube or performing code reviews to identify and fix security flaws.

6. Web Application Security

- **Description**: Secure web applications against common security threats like SQL injection and cross-site scripting (XSS).
- **Practical Activities**: Performing web application security assessments using tools like OWASP ZAP or Burp Suite, identifying vulnerabilities, and implementing security controls.

7. Endpoint Security

- **Description**: Protect endpoints against malware, ransomware, and other threats.
- **Practical Activities**: Deploying endpoint protection solutions like antivirus software, configuring firewalls and intrusion detection/prevention systems (IDS/IPS), and managing security updates and patches.

8. Identity and Access Management (IAM)

- **Description**: Implement IAM solutions to control and monitor user access to systems and data.
- **Practical Activities**: Configuring user authentication and authorization mechanisms, implementing multi-factor authentication (MFA), and managing privileged access.

9. Security Awareness Training

- **Description**: Educate employees about cybersecurity risks and best practices.
- **Practical Activities**: Developing security awareness training programs, conducting phishing simulations, and promoting a security-conscious culture within the organization.

10. Threat Intelligence and Threat Hunting

- **Description**: Utilize threat intelligence feeds and proactive threat hunting techniques to identify and mitigate security threats.

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BCYS102-T
Linear algebra and Calculus

UNIT-I **Marks-10**

Fundamentals of Calculus:-Limits and continuity,Differentiation and derivatives,Applications of derivatives, Integration and antiderivatives.

UNIT-II **Marks-10**

Multivariable Calculus:-Partial derivatives,Multiple integrals,Vector calculus (gradient, divergence, curl),Line and surface integrals.

UNIT-III **Marks-10**

Linear Algebra Fundamentals:-Vectors and vector spaces,Matrices and matrix operations,Determinants and their properties,Eigenvalues and eigenvectors.

UNIT-IV **Marks-10**

Linear Transformations and Matrix Decompositions:-Linear transformations and their properties,Orthogonalization methods (Gram-Schmidt process),Matrix decompositions (LU, QR, eigenvalue decompositions).

UNIT-V **Marks-10**

Applications of Linear Algebra and Calculus:-Optimization problems and techniques,Differential equations and their solutions,Applications in physics, engineering, and computer science.

Reference Books:

"Calculus: Early Transcendentals" by James Stewart

"Calculus" by Michael Spivak

"Thomas' Calculus" by Joel Hass, Christopher Heil, and Maurice D. Weir

"Multivariable Calculus" by James Stewart

"Vector Calculus, Linear Algebra, and Differential Forms: A Unified Approach" by John Hubbard and Barbara Burke Hubbard

"Calculus on Manifolds: A Modern Approach to Classical Theorems of Advanced Calculus" by MichaelSpivak.

"Linear Algebra and Its Applications" by David C. Lay, Steven R. Lay, and Judi J. McDonald

"Introduction to Linear Algebra" by Gilbert Strang

"Linear Algebra Done Right" by Sheldon Axler

"Matrix Analysis and Applied Linear Algebra" by Carl D. Meyer

"Numerical Linear Algebra" by Lloyd N. Trefethen and David Bau III

"Applied Linear Algebra" by Olver and Shakiban

"Introduction to the Theory of Neural Computation" by John A. Hertz, Anders Krogh, and Richard G. Palmer

"Introduction to Applied Linear Algebra: Vectors, Matrices, and Least Squares" by Stephen Boyd and LievenVandenberghe

"Introduction to Partial Differential Equations with Applications" by E. C. Zachmanoglou and Dale W. Thoe

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BCYS103-T
Digital Logic and system design

UNIT-I **Marks-10**

Introduction to Digital Logic:-Binary number systems,Boolean algebra and logic gates, Combinational logic circuits, Boolean function simplification techniques.

UNIT-II **Marks-10**

Combinational Logic Design:-Designing combinational circuits using logic gates,

Arithmetic circuits (adders, subtractors), Multiplexers, demultiplexers, and encoders,

Decoders and priority encoders.

UNIT-III **Marks-10**

Sequential Logic Design:-Flip-flops and latches,State diagrams and state tables,

Analysis and design of synchronous sequential circuits, Finite State Machines (FSMs).

UNIT-IV **Marks-10**

Memory and Programmable Logic:-Memory devices (RAM, ROM, EEPROM),

Programmable Logic Devices (PLDs), Field-Programmable Gate Arrays (FPGAs),

Introduction to Hardware Description Languages (HDLs) such as Verilog and VHDL.

UNIT-V **Marks-10**

Advanced Topics in Digital Logic Design:- High-level synthesis,Design for Testability (DFT),Hardware description and synthesis,Application-specific integrated circuit (ASIC) design basics.

Reference Books:

"Digital Design" by M. Morris Mano and Michael D. Ciletti

"Fundamentals of Digital Logic with Verilog Design" by Stephen Brown and ZvonkoVranesic

"Digital Logic and Computer Design" by M. Morris Mano

"Logic and Computer Design Fundamentals" by M. Morris Mano and Charles R. Kime

"Digital Systems Design with FPGAs and CPLDs" by Ian Grout

"Digital Design: Principles and Practices" by John F. Wakerly

"Sequential Logic and Verilog HDL Fundamentals" by Joseph Cavanagh

"Digital Design: Principles and Practices" by John F. Wakerly

"Digital Systems: Principles and Applications" by Ronald J. Tocci et al.

"Digital Design Using Digilent FPGA Boards: Verilog / Vivado Edition" by Richard E. Haskell and Darrin M. Hanna

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BCYS104-T

Problem solving using C

UNIT-IMarks-10

Introduction to C Programming:-Overview of the C programming language,Basic syntax and structure of C programs, Variables, data types, and operators, Input and outpuoperations in C.

UNIT-IIMarks-10

Control Flow and Functions:-Decision-making statements (if-else, switch), Looping statements (for, while, do-while), Functions and parameter passing, Recursion.

UNIT-IIIMarks-10

Arrays and Pointers:-Arrays and strings in C,Pointer basics and pointer arithmetic,Dynamic memory allocation,Multi-dimensional arrays.

UNIT-IVMarks-10

File Handling and Data Structures:-File operations in C,Basics of data structures (linked lists, stacks, queues),Implementation of data structures in C,Sorting and searching algorithms.

UNIT-VMarks-10

Advanced Topics in C Programming:-Preprocessor directives,Bit manipulation and bitwise operators,Introduction to low-level programming concepts, Debugging and optimization techniques.

Reference Books:

"C Programming: A Modern Approach" by K. N. King
"The C Programming Language" by Brian W. Kernighan and Dennis M. Ritchie
"Programming in C" by Stephen G. Kochan
"Pointers in C: A Hands-on Approach" by HrishikeshDewan and NidhiAgarwal
"Data Structures Using C" by Aaron M. Tenenbaum et al.
"Modern C: Programming with Testing and Debugging" by Jens Gustedt

BCYS104-P C LAB

Basic Input and Output

- **Description**: Learn how to handle basic input and output operations in C.
- **Practical Activities**: Writing programs to read and print different data types using `scanf` and `printf`.

2. Control Structures

- **Description**: Understand and implement decision-making and looping constructs.

- **Practical Activities**: Writing programs using `if`, `else if`, `else`, `switch`, `for`, `while`, and `do-while` loops.

3. Functions

- **Description**: Learn how to create and use functions in C.
- **Practical Activities**: Writing programs that define and call user-defined functions, understand scope and lifetime of variables, and pass arguments by value and by reference.

4. Arrays and Strings

- **Description**: Work with arrays and strings for data storage and manipulation.
- **Practical Activities**: Writing programs to perform operations like searching, sorting, and manipulating arrays and strings (e.g., string concatenation, comparison).

5. Pointers and Dynamic Memory Allocation

- **Description**: Understand pointers and their usage in dynamic memory management.
- **Practical Activities**: Writing programs to demonstrate pointer arithmetic, pointer to functions, and dynamic memory allocation using `malloc`, `calloc`, `realloc`, and `free`.

6. Structures and Unions

- **Description**: Learn to define and use structures and unions to create complex data types.
- **Practical Activities**: Writing programs to define structures and unions, access their members, and use them in functions.

7. File Handling

- **Description**: Understand file operations for reading and writing data to files.
- **Practical Activities**: Writing programs to open, read, write, and close files using `fopen`, `fscanf`, `fprintf`, `fgets`, and `fputs`.

8. Command Line Arguments

- **Description**: Learn to handle command line arguments passed to a program.
- **Practical Activities**: Writing programs that take arguments from the command line and process them (e.g., counting the number of arguments, performing operations based on arguments).

9. Preprocessor Directives

- **Description**: Understand the use of preprocessor directives for macro definition, file inclusion, and conditional compilation.
- **Practical Activities**: Writing programs to define macros, include header files, and use `#ifdef`, `#ifndef`, and `#endif` for conditional compilation.

10. Data Structures (Linked Lists, Stacks, Queues)

- **Description**: Implement and use basic data structures like linked lists, stacks, and queues.
- **Practical Activities**: Writing programs to create, traverse, insert, and delete nodes in linked lists; implement stack operations (push, pop) and queue operations (enqueue, dequeue).

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BCYS105-T

Cyber Defense Strategies

UNIT-IMarks-10

Introduction to Cyber Defense:-Overview of cybersecurity threats and challenges,Understanding the cybersecurity landscape, Principles of cyber defense.

UNIT-IIMarks-10

Risk Management and Assessment:-Risk assessment methodologies,

Identifying and prioritizing cybersecurity risks, Risk mitigation strategies.

UNIT-IIIMarks-10

Network Security:-Fundamentals of network security architecture,
Intrusion detection and prevention systems,Secure network design principles.

UNIT-IVMarks-10

Incident Response and Management:-Incident response planning and preparation,Incident detection, analysis, and containment, Post-incident recovery and lessons learned.

UNIT-VMarks-10

Cyber Defense Technologies:-Cryptography and encryption techniques, Security tools and technologies (firewalls, antivirus, etc.), Emerging trends in cyber defense.

Reference Book:

"Cybersecurity Essentials" by Charles J. Brooks and Christopher Grow, "Risk Management Framework: A Lab-Based Approach to Securing Information Systems" by James Broad , "Network Security Essentials: Applications and Standards" by William Stallings, "Incident Response & Computer Forensics" by Jason T. Luttgens, Matthew Pepe, and Kevin Mandia ,"Applied Cyber Security and the Smart Grid" by Eric D. Knapp and Raj Samani.

BCYS105-P Cyber Defense LAB

Network Security Monitoring (NSM)

- **Description**: Implementing tools and techniques to monitor network traffic for security threats.
- **Practical Activities**: Setting up intrusion detection systems (IDS) or network security monitoring (NSM) platforms like Security Onion, Zeek, or Suricata to detect and analyze suspicious network activity.

2. Endpoint Detection and Response (EDR)

- **Description**: Deploying solutions to monitor and respond to security threats on endpoints.
- **Practical Activities**: Implementing endpoint detection and response (EDR) solutions like Crowdstrike, Carbon Black, or Microsoft Defender ATP to detect and mitigate threats on endpoints.

3. Security Information and Event Management (SIEM)

- **Description**: Deploying and configuring SIEM solutions to centralize and analyze security event logs.
- **Practical Activities**: Setting up SIEM platforms like Splunk, Elastic SIEM, or QRadar, configuring log sources, creating correlation rules, and generating security reports.

4. Security Operations Center (SOC) Operations

- **Description**: Establishing and operating a security operations center to monitor and respond to security incidents.
- **Practical Activities**: Building and staffing a SOC, developing incident response playbooks, and conducting incident response exercises and simulations.

5. Threat Intelligence Integration

- **Description**: Incorporating threat intelligence feeds into security operations to enhance threat detection and response capabilities.
- **Practical Activities**: Subscribing to threat intelligence feeds, analyzing indicators of compromise (IOCs), and integrating threat intelligence into security tools and processes.

6. Security Orchestration, Automation, and Response (SOAR)

- **Description**: Automating security workflows and response actions to improve efficiency and effectiveness.
- **Practical Activities**: Implementing SOAR platforms like Demisto, Phantom, or Swimlane to orchestrate security workflows, automate response actions, and streamline incident response processes.

7. Cyber Threat Hunting

- **Description**: Proactively searching for signs of security threats and compromise within an organization's network.
- **Practical Activities**: Developing threat hunting strategies, analyzing network and system logs, and using threat hunting tools and techniques to identify and mitigate security threats.

8. Cloud Security Monitoring

- **Description**: Monitoring cloud environments for security threats and vulnerabilities.
- **Practical Activities**: Implementing cloud security monitoring solutions like AWS GuardDuty, Azure Security Center, or Google Cloud Security Command Center to detect and respond to threats in cloud environments.

9. Incident Response Planning and Execution

- **Description**: Developing incident response plans and procedures to effectively respond to security incidents.
- **Practical Activities**: Creating incident response playbooks, conducting tabletop exercises and incident response drills, and responding to simulated security incidents.

10. Security Awareness and Training

- **Description**: Educating employees about cybersecurity risks and best practices to improve the organization's security posture.
- **Practical Activities**: Developing security awareness training programs, conducting phishing simulations, and promoting a security-conscious culture within the organization.

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BCYS106

Cyber Laws and IPR

UNIT-I **Marks-10**

Introduction:-Overview of Computer and Web Technology, Need for Cyber Law, CyberJurisprudenceatInternationalandIndianLevel,JurisdictionalAspects inCyberLaw Issues of jurisdiction in cyberspace, Types of jurisdiction, MinimumContactsTheory,SlidingScaleTheory,EffectsTestandInternationaltargeting,JurisdictionunderIT Act, 2000.[CO1]

UNIT-II **Marks-10**

CyberCrimes&LegalFramework:-CyberCrimesagainstIndividuals,Institution andState,Hacking,DigitalForgery, Cyber Stalking/Harassment, Ethics and Etiquettes of Cyber World,CyberPornography,IdentityTheft&Fraud,CyberTerrorism,CyberDefamation, Right to Privacy and Data Protection on Internet, Concept ofprivacy,Threattoprivacyoninternet,Self-regulationapproachtoprivacy.[CO2].

UNIT-III **Marks-10**

OverviewofIntellectualProperty:-introduction and the need for intellectual property right (IPR), IPR in India – Genesis and Development IPR in abroad, Data Protection, Open Source Software, Macro economic impact of the patent system,
Patent and kind of inventions protected by a patent, Patent document How to protect your inventions?, Granting of patent, Rights of a patent.[CO3].

UNIT-IV **Marks-10**

Copyright:-What is copyright? Latest editions of Designs, what is covered by copyright? How long does copyright last? Why protect copyright?

UNIT-V **Marks-10**

RelatedRightsand Trademarks:-What are related rights?, Distinction between related rights and copyright?, What is a trademark? Rights of trademark?, What kind of signs can be used as trademarks?, types of trademark, function does a trademark perform, How is a trademark protected?, How is a trademark registered?[CO4][CO5].

TextBooks

1. AnirudhRastogi.CyberLaw,LexisNexis.
2. VakulSharma.InformationTechnologyLawandPracticeCyberLawsandLawsRelatingtoE-Commerce,Universal Law Publishing.
3. PankajSharma.InformationSecurityandCyberLaws,Kataria,S.K.,&Sons.
4. NavneetNagpal.IntellectualPropertyRight,Ebooks2goInc.
5. Dr.S.K.singh.IntellectualPropertyRights,CentralLawAgency.

MahakaushalUniversity,Jabalpur (M.P.)

Class : B.A./B.Sc./B.Com./BBA/BCA/B.A **---II Year**
Subject : Foundation Course
Paper : I
Paper Name : (Hindi Language &Moral Values)-I।
Paper code : FC201-T

Particulars	
Unit-I	हिन्दीभाषा वहतोड़तीपत्थर (कविता) –सूर्यकान्त त्रिपाठीनिरालादिमागीगुलामी (निबंध) –राहुलसांकृत्यायन वर्ण– (स्वर–व्यंजन, वर्गीकरण, उच्चारण स्थान)
Unit-II	हिन्दीभाषा नारीत्वकाअभिशाप (निबंध) –महादेवीवर्माचीफकीदावत (कहानी) –भीष्मसाहनी विरामचिन्ह– (संकलित)
Unit-III	हिन्दीभाषा चलीफगुनाहटबौरेआम (ललित निबंध) –विवेकीराय इन्द्रधनुषकारहस्य (वैज्ञानिक लेख) –डॉ. कर्पूरमंजरीसंधि – (संकलित) पल्लवन
Unit-IV	हिन्दीभाषा सपनों की उड़ान (प्रेरक निबंध) – ए.पी.जे. अब्दुल कलाम हमारासौरमण्डल (संकलित) समास (संकलित)
Unit-V	नैतिकमूल्य शिकागोव्याख्यान (व्याख्यान) –स्वामीविवेकानंद धर्मऔरराष्ट्रवाद (लेख) –महर्षिअरविन्दसादगी (आत्मकथा) –महात्मागांधी चित्तजहाँभय शून्य (कविता) –रवीद्रनाथटैगोर

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Class : B.A./B.Sc./B.Com./BBA/BCA/B.A **---II Year**
Subject : Foundation Course
Paper : II
PaperName: English Language- II
Paper code : FC202-T

Particulars

Unit-I	Tree:TinaMorris. NightoftheScorpion:NissimEzekiel. Idgah:Premchand(translatedbykhushwantSingh). LetterofGod :G.L.Swanteh (translatedbyDonald A.Yates).MyBank Account : StephenLeacock. Godseesthetruthbutwaits:LeoTolstoy.
Unit-II	BasicEnglish Language :Idioms,Proverbs andPhrasalVerbs,Tenses, Prepositions,Determiners,VerbsArticles, Nouns&Pronouns.
Unit-III	ShortEssayongiven topics. CorrespondenceSkills(Formal&InformallettersandApplication)
Unit-IV	Translationofsentences/passageEnglishtoHindiandHinditoEnglish.
Unit-V	DraftingCV.

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Class : B.A./B.Sc./B.Com./BBA/BCA/B.A **---II Year**
Subject : Foundation Course
Paper : III
Paper Name : (Environmental Studies)
Paper code : FC203-T

Particulars

Unit-I	**StudyofEnvironmentandEcology :** (a.)Definitionandimportance. (b.) Public participation and public awareness.(c.)Ecology–Introduction. (d.)Ecosystem– Concepts,components,structure&function,energyflow.foodchain.food web, ecological pyramidsand types.
Unit-II	**EnvironmentalPollutionandPopulation:** (a.)Air,water,noise, Heat andnuclearpollution.definition, causes, effectandpreventionofpollution. (b.)Population growth, disparities between countries.(c.)Populationexplosion,familywelfare programme.(d.)Environment and humanhealth. (e.)Cleanlinessand disposalof domestic waste.
Unit-III	**NaturalResources, ProblemsandConservation:** (a.) Water Resources.(b.)ForestR esources.(c.) Land Resources.(d.)FoodRes ources.(e.)EnergyReso urces.
Unit-IV	Bio-diversity and its Protection (a.) Introduction- Genetic, species and ecosystem diversity. (b.) Value of bio-diversity − Consumable use : Productive use. Social, Moral and Aesthetic values (c.) India as a nation of mega bio-diversity centre. bio-diversity at national and local levels. (d.) Threats to bio-diversity − Loss of habitat, poaching of wildlife, man and wildlife conflicts.
Unit-V	Disaster Management and Environment and Environmental laws : (a.) Disaster Management − flood, earthquake, cyclones and landslides. (b.)Conservation of laws for air and water pollution. (c.) Wildlife conservationlaws. (d.)Role ofinformationtechnologyinprotectingenvironmentandhealth.

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BCYS201-T

Network Security

UNIT-I **Marks-10**

Network Security Terminology: Identification, Confidentiality, Authentication, Authorization, Access Control, Integrity, Non-Repudiation, Freshness, and Availability, Network Threats and Types of attacks, Introduction to malwares.

UNIT-II **Marks-10**

Cryptography Symmetric Cipher Model, Classical Cryptographic Algorithms: Monoalphabetic Substitutions such as Caesar Cipher, Cryptanalysis of Monoalphabetic ciphers; Transposition Cipher. Stream and Block Ciphe Block cipher: principles, Data Encryption Standard (DES).Concept of Asymmetric Cryptography, Rivets-Shamir-Adleman (RSA) Key Generation,Encryption and Decryption Algorithm.

UNIT-III **Marks-10**

Key Management Protocols: Solving Symmetric Key Distribution Problem, Diffie-Hellman Algorithm, Key Exchange with Public Key Cryptography or Asymmetric Cryptography, Digital Envelope, Public Key Certificate Structure, Certificate Authority.

UNIT-IV **Marks-10**

Hash Algorithms & Digital Signature Hash concept, Hash Function Requirements, Popular Message Digest and Hash Algorithms: Overview of SHA1, SHA2, MD4, MD5, Digital Signature.

UNIT-V **Marks-10**

Authentication Protocols Basic authentication protocols, concept of Key distribution centre(KDC), Needham-Schroeder Authentication Protocol. SSL and TLS, Overview of IP Security, Introduction to Firewalls and IDS.

TextBooks:

1. PrinciplesofCryptography,4thEditionbyWilliamStallings,PearsonEducation.

2. SecurityinComputing,2ndEditionbyCharlesP.Pfleeger,PrenticeHallInternational.

3. Cryptography&NetworkSecurity, 2ndEditionby AtulKahate,TMH.

4. AppliedCryptography:Protocols, Algorithms,and SourceCodein C,2nd Editionby BruceSchneier,JohnWileyand Sons.

5. FirewallsandInternet Security,2ndEditionbyBillCheswickandSteveBellovin,AddisonWesley.

6. SecurityTechnologiesfortheworldwideweb,2ndEditionbyRolfOppliger,ArtechHouse,Inc.

BCYS202-T

Object Oriented Programming Using C++

UNIT-I **Marks-10**

Introduction to object oriented programming, user defined types, structures, unions,polymorphism, encapsulation. Getting started with C++ syntax, data-type, variables,strings,functions,defaultvaluesinfunctions,recursion,namespaces,operators,flowcontrol,arraysand pointers.

UNIT-II **Marks-10**

Abstractionmechanism:Classes,private,public,constructors,destructors,memberdata,memberfunctions,inlinefunction,friendfunctions,staticmembers,andreferences.
Inheritance: Class hierarchy, derived classes, single inheritance, multiple, multilevel,hybridinheritance,roleofvirtualbaseclass,constructor anddestructorexecution,baseinitializationusing derived class constructors.

UNIT-III **Marks-10**

Polymorphism:Binding,Staticbinding,Dynamicbinding,Staticpolymorphism:FunctionOverloading, Ambiguity in function overloading, Dynamic polymorphism: Base classpointer, object slicing, late binding, method overriding with virtual functions, pure virtualfunctions,abstract classes.

UNIT-IV **Marks-10**

Operator Overloading: This pointer, applications of this pointer, Operator function,member and non member operator function, operator overloading, I/O operators.Exception handling: Try, throw, and catch, exceptions and derived classes, functionexceptiondeclaration,unexpectedexceptions,exceptionwhenhandlingexceptions, resourcecapture and release.

UNIT-V **Marks-10**

Dynamicmemorymanagement,newanddeleteoperators,objectcopying,copyconstructor,assignmentoperator, virtualdestructor.
Template:templateclasses,templatefunctions.
StandardTemplateLibrary:Fundamentalideaaboutstring,iterators,hashes,iostreamsandothertypes.
Namespaces:userdefinednamespaces,namespacesprovidedbylibrary.Object OrientedDesign,designandprogramming,roleofclasses.

TextBooks:

1. ObjectOrientedProgrammingwithC++ by E. Balagurusamy, McGraw-HillEducation(India)
2. ANSIandTurboC++ by AshokeN.Kamthane,PearsonEducation

Reference Books:

1. Big C++ -WileyIndia
2. C++: TheCompleteReference-Schildt,McGraw-HillEducation(India)
3. C++andObjectOrientedProgramming–Jana,PHILearning.
4. ObjectOrientedProgrammingwithC++ -RajivSahay,Oxford
5. MasteringC++ - Venugopal,McGraw-HillEducation(India)

BCYS202-P C++ LAB

Description**: Learn how to handle basic input and output operations in C++.**

- **Practical Activities**: Writing programs to read and print different data types using `cin` and `cout`, and using manipulators for formatting output.

2. Control Structures

- **Description**: Understand and implement decision-making and looping constructs.
- **Practical Activities**: Writing programs using `if`, `else if`, `else`, `switch`, `for`, `while`, and `do-while` loops to solve various problems.

3. Functions

- **Description**: Learn how to create and use functions in C++.
- **Practical Activities**: Writing programs that define and call user-defined functions, use function overloading, and understand default arguments and inline functions.

4. Classes and Objects

- **Description**: Understand the principles of object-oriented programming by creating classes and objects.
- **Practical Activities**: Writing programs to define classes, create objects, and implement member functions. Demonstrating concepts of encapsulation, constructors, and destructors.

5. Operator Overloading

- **Description**: Learn to overload operators to work with user-defined data types.
- **Practical Activities**: Writing programs to overload operators such as `+`, `-`, `*`, `==`, and `<<` for custom classes.

6. Inheritance and Polymorphism

- **Description**: Explore the concepts of inheritance and polymorphism in C++.
- **Practical Activities**: Writing programs to create base and derived classes, use virtual functions, and demonstrate runtime polymorphism through method overriding.

7. Templates

- **Description**: Implement generic programming using templates.
- **Practical Activities**: Writing programs that use function templates and class templates to handle different data types with a single code base.

8. Exception Handling

- **Description**: Learn how to handle runtime errors using exception handling.
- **Practical Activities**: Writing programs that use `try`, `catch`, and `throw` to handle exceptions. Implementing custom exception classes.

9. File Handling

- **Description**: Understand file operations for reading and writing data to files.
- **Practical Activities**: Writing programs to open, read, write, and close files using file streams (`ifstream`, `ofstream`, and `fstream`).

10. STL (Standard Template Library)

- **Description**: Utilize the components of the Standard Template Library to write efficient and effective code.
- **Practical Activities**: Writing programs that use STL components like vectors, lists, queues, stacks, maps, and algorithms such as sort, find, and accumulate.

BCYS203-T
Web Technology

UNIT-I **Marks-10**

Introduction to Web Technologies:-Overview of the Internet and World Wide Web, Client-server architecture and web protocols (HTTP, HTTPS), Introduction to HTML, CSS, and JavaScript.

UNIT-II **Marks-10**

Frontend Development:-Advanced HTML5 and CSS3 features,Responsive web design principles and techniques,Introduction to frontend frameworks/libraries (e.g., Bootstrap, React, Vue.js).

UNIT-III **Marks-10**

Backend Development:-Introduction to server-side scripting languages (e.g., PHP, Node.js, Python),Database management systems and SQL fundamentals,Building dynamic web applications with server-side frameworks (e.g., Express.js, Django).

UNIT-IV **Marks-10**

Web Security and Performance Optimization:-Understanding common web security threats and vulnerabilities,Techniques for securing web applications (e.g., HTTPS, input validation, authentication, authorization),Performance optimization strategies for web applications (e.g., minification, caching, CDN).

UNIT-V **Marks-10**

Emerging Web Technologies and Trends:-Introduction to progressive web apps (PWAs) and single-page applications (SPAs)Exploring the Internet of Things (IoT) and its impact on web developmentDiscussion on current trends and future directions in web technology.

Reference Book:

"Web Development and Design Foundations with HTML5" by Terry Felke-Morris
"Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics" by Jennifer Robbins.
"Node.js Web Development: Server-side Development with Node 10 made easy" by David Herron.
"Web Application Security: A Beginner's Guide" by Bryan Sullivan.
"Building Progressive Web Apps: Bringing the Power of Native to the Browser" by Tal Ater.

BCYS204-T
Java Programming

UNIT-I Marks-10

Introduction to Java, history, Characteristics, abject oriented programming, data types,variablesarrays, difference between javaandC++

UNIT-II Marks-10

ControlStatements:Selection,iteration,jumpstatementsoperators,IntroductiontoClasses, fundamentals Constructor methods, Stack, Class, inheritance, creating multilevelhierarchy,methodoverridingpackagesandinterfaces,exceptionhandling,multithreadedprogrammingI/oapplets.

UNIT-III Marks-10

JavaLibrary,Stringhandling, stringcomparison, stringbuffer, utilityClasser,vectorstackdictionaryappletClass,introductiontoAWT,workingwithframewindows.

UNIT-IV Marks-10

Javabeans,beansarchitecture,AWTcomponents,AdvantagesofJavabeans,beansSerialization, JDBC Class & Methods, API Components, IDBC Components Driver,Connectivitytodatabase.

UNIT-V Marks-10

Processing result and interfaces, RMI, Comparison of distributed and Non-distributedJava programs, Interfaces, RMI Architecture layer, ODBC, CORBA, CORBA Services andProducts,CGI, StructureofCGI.

ReferenceBooks

JAVA THE COMPLETE REFERENCE BY PATRICK NAUGHTON AND HERBERT SCHILDT. TMHPUBLICATION ISBN0-07-463769-X
PROGRAMMING WITH JAVABYE.BALAGURUSWAMYTMHPUBLICATIONS ISBN 0-07-463542-5 USING JAVA 1.2 BY JOSEPH WEBER. PHI – ISBN-81-203-1558-9

BCYS204-P Java LAB

Basic Input and Output

- **Description**: Learn how to handle basic input and output operations in Java.
- **Practical Activities**: Writing programs to read and print different data types using `Scanner` for input and `System.out` for output.

2. Control Structures

- **Description**: Understand and implement decision-making and looping constructs.
- **Practical Activities**: Writing programs using `if`, `else if`, `else`, `switch`, `for`, `while`, and `do-while` loops to solve various problems.

3. Classes and Objects

- **Description**: Understand the principles of object-oriented programming by creating classes and objects.
- **Practical Activities**: Writing programs to define classes, create objects, and implement member functions. Demonstrating concepts of encapsulation, constructors, and destructors.

4. Inheritance and Polymorphism

- **Description**: Explore the concepts of inheritance and polymorphism in Java.
- **Practical Activities**: Writing programs to create base and derived classes, use method overriding, and demonstrate runtime polymorphism using abstract classes and interfaces.

5. Exception Handling

- **Description**: Learn how to handle runtime errors using exception handling.
- **Practical Activities**: Writing programs that use `try`, `catch`, `finally`, and `throw` to handle exceptions. Implementing custom exception classes.

6. Collections Framework

- **Description**: Utilize Java's Collections Framework to manage groups of objects.
- **Practical Activities**: Writing programs that use collections like `ArrayList`, `LinkedList`, `HashMap`, `HashSet`, and `TreeSet`. Performing operations like adding, removing, and iterating over elements.

7. File Handling

- **Description**: Understand file operations for reading and writing data to files.
- **Practical Activities**: Writing programs to open, read, write, and close files using `FileReader`, `FileWriter`, `BufferedReader`, and `BufferedWriter`.

8. Multithreading

- **Description**: Learn to create and manage multiple threads to perform concurrent tasks.
- **Practical Activities**: Writing programs to create threads by extending `Thread` class and implementing `Runnable` interface. Synchronizing threads to avoid race conditions.

9. Graphical User Interface (GUI)

- **Description**: Design and implement GUI applications using Java's Swing library.
- **Practical Activities**: Writing programs to create windows, dialogs, buttons, text fields, and other GUI components. Handling events like button clicks.

10. Networking

- **Description**: Implement network programming using Java's networking classes.
- **Practical Activities**: Writing programs to create client-server applications using `Socket` and `ServerSocket` classes. Implementing simple chat applications or file transfer programs.

BCYS205-T
Cloud Computing

UNIT-I **Marks-10**

Introduction to Cloud Computing:-Overview of cloud computing concepts, models, and deployment types, Evolution of cloud computing and its impact on businesses and IT infrastructure, Cloud service providers and their offerings: AWS, Azure, Google Cloud Platform.

UNIT-II **Marks-10**

Cloud Infrastructure and Virtualization:-Virtualization technologies: hypervisors, containers (Docker, Kubernetes), Infrastructure as a Service (IaaS) offerings and architecture, Cloud storage solutions: object storage, block storage, file storage.

UNIT-III **Marks-10**

Cloud Platforms and Services :-Platform as a Service (PaaS) offerings: database services, application hosting, serverless computing, Software as a Service (SaaS) applications and their advantages, Hybrid cloud and multi-cloud architectures.

UNIT-IV **Marks-10**

Cloud Security and Compliance:-Security challenges in cloud computing: data breaches, identity management, compliance requirements, Cloud security best practices: encryption, access control, network security, Compliance standards and certifications: GDPR, HIPAA, SOC 2.

UNIT-V **Marks-10**

Cloud Migration and Management:-Strategies for cloud migration: lift-and-shift, re-platforming, refactoring, Cloud management tools and platforms: monitoring, orchestration, automation, Cost optimization techniques and tools.

Reference Book:
"Cloud Computing: Concepts, Technology & Architecture" by Thomas Erl, Ricardo Puttini, and ZaighamMahmood, "Virtualization Essentials" by Matthew Portnoy, "Architecting the Cloud: Design Decisions for Cloud Computing Service Models" by Michael J. Kavis, "Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance" by Tim Mather, SubraKumaraswamy, and ShahedLatif, "Migrating to the Cloud: A Practical Guide for Business Decision Makers" by Jason Nash and Darren Guckenheimer.

BCYS205-P Cloud Computing LAB

Virtual Machine Provisioning

- **Description**: Learn to provision and manage virtual machines (VMs) on cloud platforms.
- **Practical Activities**: Deploying VM instances on cloud providers like AWS EC2, Google Cloud Compute Engine, or Microsoft Azure Virtual Machines. Configuring and managing VMs using cloud management consoles or APIs.

2. Containerization with Docker

- **Description**: Understand containerization technology and how to use Docker for packaging, distributing, and running applications.
- **Practical Activities**: Building Docker images, creating containers, managing container lifecycles, and deploying containerized applications on cloud platforms.

3. Infrastructure as Code (IaC)

- **Description**: Learn to automate infrastructure provisioning and management using tools like Terraform or AWS CloudFormation.
- **Practical Activities**: Writing infrastructure code to define and deploy cloud resources such as virtual networks, storage, compute instances, and security groups.

4. Serverless Computing

- **Description**: Explore serverless computing models such as AWS Lambda, Google Cloud Functions, or Azure Functions for executing code without managing servers.
- **Practical Activities**: Developing and deploying serverless functions to perform tasks like data processing, event handling, or API endpoints on cloud platforms.

5. Cloud Storage Solutions

- **Description**: Understand different cloud storage options like object storage, block storage, and file storage services.
- **Practical Activities**: Using cloud storage services such as Amazon S3, Google Cloud Storage, or Azure Blob Storage to store and manage data. Configuring access controls, versioning, and lifecycle policies.

6. Database Services

- **Description**: Learn to use managed database services provided by cloud providers for storing and querying structured data.
- **Practical Activities**: Setting up and configuring databases like Amazon RDS, Google Cloud SQL, or Azure Database for MySQL/PostgreSQL/SQL Server. Importing data, creating tables, and executing queries.

7. Load Balancing and Auto-scaling

- **Description**: Implement load balancing and auto-scaling mechanisms to distribute traffic and handle varying workloads efficiently.
- **Practical Activities**: Configuring load balancers like AWS ELB, Google Cloud Load Balancing, or Azure Load Balancer to distribute incoming requests. Setting up auto-scaling policies based on CPU utilization or other metrics.

8. Monitoring and Logging

- **Description**: Learn to monitor and analyze cloud infrastructure and applications for performance, availability, and security.
- **Practical Activities**: Setting up monitoring dashboards using tools like AWS CloudWatch, Google Cloud Monitoring, or Azure Monitor. Configuring logging and alerting for detecting and responding to issues.

9. Network Security

- **Description**: Understand cloud networking concepts and implement security measures to protect data and resources.
- **Practical Activities**: Configuring network access controls, firewalls, VPNs, and security groups on cloud platforms. Implementing encryption, authentication, and authorization mechanisms.

10. Cloud Native Application Development

- **Description**: Develop applications designed to run natively on cloud platforms, leveraging cloud-native technologies and principles.
- **Practical Activities**: Building microservices architectures using container orchestration platforms like Kubernetes. Implementing cloud-native design patterns for scalability, resilience, and agility.

BCYS206-T

Natural Language processing

UNIT-I **Marks-10**

Introduction to Natural Language Processing:-Overview of NLP and its applications, Basics of linguistics and language processing, Text preprocessing techniques: tokenization, stemming, lemmatization.

UNIT-II **Marks-10**

Text Representation and Feature Engineering:-Bag-of-Words (BoW) model and term frequency-inverse document frequency (TF-IDF) representation,Wordembeddings: Word2Vec, GloVe, and fastText, Document embeddings: Doc2Vec, Paragraph Vectors.

UNIT-III **Marks-10**

Text Classification and Sentiment Analysis:-Supervised learning algorithms for text classification: Naive Bayes, Support Vector Machines (SVM), and logistic regression, Sentiment analysis techniques: lexicon-based methods, machine learning approaches, Evaluation metrics for text classification and sentiment analysis tasks.

UNIT-IV **Marks-10**

Sequence Modeling and Language Understanding;-Basics of sequence modeling: Hidden Markov Models (HMMs) and Conditional Random Fields (CRFs), Introduction to Recurrent Neural Networks (RNNs) and Long Short-Term Memory (LSTM) networks, Applications of sequence models in part-of-speech tagging, named entity recognition, and dependency parsing.

UNIT-V **Marks-10**

Advanced Topics in Natural Language Processing:-Attention mechanisms in neural networks: Transformers and the Transformer architecture,Transfer learning and pre-trained language models: BERT, GPT, and their variants, Ethical considerations and challenges in NLP: bias, fairness, and privacy concerns.

Reference Book:

"Speech and Language Processing" by Daniel Jurafsky and James H. Martin."Natural Language Processing in Action" by Lane, Howard, and Hapke."Text Analytics with Python" by DipanjanSarkar."Neural Network Methods in Natural Language Processing" by Goldberg, Yoav."Natural Language Processing with Python and spaCy" by YuliVasiliev.

Class : B.A./B.Sc./B.Com./BBA/BCA/B.A---**III Year**
Subject : Foundation Course
Paper : I
Paper Name : (HindiLanguage&MoralValues) –III
Paper code : FC301-T

Particulars

न्दपज.ए	हिन्दीभाषा मेरेसहयात्री (यात्रा वृतांत) –अमृतलालबेगड़	मध्यप्रदेश की लोककलाएं (संकलित) लोकोक्तियाँ एवंमुहावरे (संकलित)
न्दपज.ब्ए	हिन्दीभाषा जनसंचारमाध्यम (प्रिन्ट, इलै, एवंसोशल मीडिया) टूटतेहुए (एकांकी) –सुरेश शुक्लचंद्र संक्षिप्तियाँ
न्दपज.ब्ब	हिन्दीभाषा पत्रकारिता के विभिन्नआयाम (संकलित) मध्यप्रदेश कालोकसाहित्य (संकलित) पत्र लेखन–आवेदन, प्रारूपण, आदेशपरिपत्र ज्ञापन, अनुस्मारक (संकलित)
न्दपज.प्ट	हिन्दीभाषा राजभाषा, हिन्दी (संकलित) हिन्दी की संवैधानिक एवंव्यावहारिकस्थितिदूरभाषऔरमोबाइल (सकलित) हिन्दी की शब्दसम्पदा (संकलित) अनुवाद : अर्थप्रकार एवंअभ्यास
न्दपज.ट	नैतिकमूल्य विश्व के प्रमुख धर्म एवंमहत्वपूर्णविशेषताएं (हिन्दू धर्म, जैन धर्म, बौद्ध धर्म, सिक्ख धर्म, ईसाई धर्म, इस्लाम धर्म) सत्य के साथमेरेप्रयोग (महात्मागाँधी की आत्मकथाकासंक्षिप्त संस्करण)

Class : B.A./B.Sc./B.Com./BBA/BCA/B.A---**III Year**
Subject : Foundation Course
Paper : II
PaperName: EnglishLanguage - III
Paper code : FC302-T

Particulars

Unit-I	Stopping by Woods on a snowy Evening: Robert Frost. Cherry Tree : Ruskin Bond. The Axe : R.K. Narayan. The Selfish Giant : Oscar Whilde On The Rule of the Road : A.G. Gardiner. The song of Kabir : Translated by Tagore
Unit-II	Basic Language Skills : Transformation of sentences, Direct-Indirect Speech,Active.PassiveVoice,ConfusingWords,Misusedwords,Similarwordsw ith differentmeaning.
Unit-III	ReportWriting,NarrationSkills,Narrationofeventsandsituations.
Unit-IV	DraftingofE-mails.
Unit-V	DraftingCV.

Class : B.A./B.Sc./B.Com./BBA/BCA/B.A---**III Year**
Subject : Foundation Course
Paper : III
Paper Name : (Basics of Computer & Information technology)
Paper code : FC303-T

Particulars

Unit-I	**IntroductiontoComputer:** BasicOrganizationofComputersystem:Blockdiagram&Functions(Central ProcessingUnit,Input/OutputUnit,StorageUnit);Characteristics:Capabilities& Limitations. TypesofComputingDevices:DesktopLaptop&Notebooksmart-Phone,Tablet PC,Server,Workstation&theirCharacteristics. PrimaryMemory&TheirTypes:RAM,ROM,PROM,EPROMEEPROM,Cache Memory. **PeripheralDevices:** InputDevices:KeyboardMouse,Trackball,Joystick,DigitizerorGraphictablet, Scanners,DigitalCamera,WebCamera,MICR,OCR,OMR,Bar-code Reader, VoiceRecognitiondeviceLightpen&TouchScreen. OutputDevices:DisplayDevices(CRT,TFT,LCD,LED,MultimediaProjectors): VideoStandard:VGA,SVGA,XGAetc,ImpactPrinters(DaisyWheel,Dot Matrix&LinePrinter); Nonimpactprinter(Inkjet,Laser,Thermal); **StorageDevices:** MagneticTape,Cartridge,DataDrives,HardDiskDrives(Internal&External), FloppyDisks,CD,VCD,CD-RW,ZipDriveDVD,DVD-RW,USBFlashDrive, BlueRayDisc&Memorycards.
Unit-II	**OperatingSystem(OS)**
	Dos Basic: FAT, File & Directory Structure and naming rules, Booting process,DOSsystem files, internal &External Dos Commands. Windows Basics (onlyelementaryideas): Windows 7 & 8: Desktop, Control Panel: saving, remaining, moving copying andsearchingfiles&folders,restoringfromrecycleBin.Creatingshortcut,EstablishingNetwork Connections.
Unit-III	**MSWord** Text editing and formatting using Word file in various file formats: Previewingdocuments,Printingdocumenttofile/page:ProtectingdocumentEditingofselectedtext,InsertingDeletingand Movingtext. Formattingdocuments:pageLayout,Paragraphformat,AligningtextandParagraph,Borders and Shading,Headers andFooters.
Unit-IV	**MSPowerPoint&MSExcel:** Creatingpresentationusingslidemasterandtemplateinvariousthemes&variants. Workingwithslide,move,copy,delete,duplicate,slidelayouts,presentationviews. Formatmenu: Font,Paragraph,drawing&editing. Printingpresentation:Printslides,notes,handoutsandoutlines. Savingpresentationindifferentfileformats. Workbook&worksheet:Enteringdataintoworksheet(General,Number,Currency,Date, Time,Text,Accountingetc.);Renaming,Copying,Inserting,deleting&protectingworksheet.

	WorkingwithRow&Column(Inserting,deleting,Pasting,Resizing&Hiding),Cell&Cellformatting, and Conceptofrange.
Unit-V	Internet: World Wide Web Dial up connectivity, leased line, VSAT, Broad Band,WI-FI, URL, Domain name, Web Dial up Browser (Internet Explorer, Firebox,Google Chrome, opera, UC Browser etc.) Search Engine (Google, Bing, Ask etc);Website:Static&Dynamic; Differencebetweenwebsite&Portal. E-mail:Accountopening.Sending&ReceivingMails,ManagingContacts&Folders.
	E-mail,Internet &SocialNetworkingEthics.Typesofviruses&antivirus. ComputersecurityIssues &itsprotectionthroughfirewall &antivirus. Makingsecuredonlinetransactions.

TextBooks :

1. PCSoftwareforWindowsbyR.K. Taxali.
2. FundamentalofComputersbyP.K.Sinha.
3. ComputerTodaybySuresh K. Basandra
4. ComputerfundamentalsandArchitechturebyB.Ram.
5. InternetSecuritybyKenneth EinarHimma, 2007.
6. InternetSecuritySecretsbyJohn R.Vacca, 2007.

BCYS301-T
Data Collection and Cleaning

UNIT-I **Marks-10**

Introduction to Data Collection and Cleaning, Overview of data collection processes, Importance of data cleaning in the data analysis pipeline, Common challenges and issues in data collection and cleaning.

UNIT-II **Marks-10**

Data Collection Methods, Types of data sources (e.g., surveys, interviews, web scraping), Sampling techniques and their implications, Ethical considerations in data collection.

UNIT-III **Marks-10**

Data Cleaning Techniques, Identifying and handling missing data, Outlier detection and treatment methods, Data transformation and normalization techniques.

UNIT-IV **Marks-10**

Data Quality Assessment, Metrics for assessing data quality, Data validation and verification techniques, Establishing data quality standards.

UNIT-V **Marks-10**

Advanced Topics in Data Cleaning, Automated data cleaning tools and algorithms, Handling unstructured data, Case studies and real-world examples.

Reference Book:

"Practical Data Cleaning" by Tal Galili "Data Science for Business" by Foster Provost and Tom Fawcett
"Sampling: Design and Analysis" by Sharon L. Lohr ,"Web Scraping with Python" by Ryan Mitchell
"Advanced Data Management" by Roland Bouman and Alberto LluchLafuente
"Clean Data: A Handbook of Data Cleaning Techniques in R" by Edwin de Jonge and Mark van der Loo.

BCYS301-P Data Collection LAB

Web Scraping

- **Description**: Learn how to extract data from websites using libraries like BeautifulSoup or Scrapy.
- **Practical Activities**: Writing scripts to scrape data from websites, parse HTML/XML documents, and save the extracted data to a file or database.

2. API Integration

- **Description**: Collect data from external sources through APIs (Application Programming Interfaces).
- **Practical Activities**: Accessing public APIs (e.g., Twitter API, Google Maps API) to retrieve data such as tweets, weather information, or geographic data.

3. Sensor Data Collection

- **Description**: Collect data from sensors embedded in devices or IoT (Internet of Things) devices.
- **Practical Activities**: Setting up sensors to collect environmental data (e.g., temperature, humidity) or device data (e.g., motion sensors, GPS sensors) and storing the data for analysis.

4. Survey Design and Implementation

- **Description**: Design surveys to collect data from individuals or groups.
- **Practical Activities**: Creating survey questionnaires using survey design tools (e.g., Google Forms, SurveyMonkey), distributing surveys, and analyzing survey responses.

5. Social Media Data Collection

- **Description**: Gather data from social media platforms for analysis.
- **Practical Activities**: Using social media APIs (e.g., Twitter API, Facebook Graph API) to collect tweets, posts, or user profiles for sentiment analysis, trend analysis, or user profiling.

6. Data Logging

- **Description**: Log data from various sources such as software applications, network devices, or industrial equipment.
- **Practical Activities**: Implementing data logging mechanisms to record events, transactions, or system metrics over time for monitoring and analysis.

7. Mobile App Data Collection

- **Description**: Collect data generated by mobile applications installed on users' devices.
- **Practical Activities**: Implementing analytics SDKs (Software Development Kits) or integrating tracking frameworks (e.g., Google Analytics, Firebase Analytics) into mobile apps to collect usage data, user interactions, or app performance metrics.

8. Crowdsourcing

- **Description**: Gather data from a large group of people or contributors through crowdsourcing platforms.
- **Practical Activities**: Posting tasks or surveys on crowdsourcing platforms (e.g., Amazon Mechanical Turk, CrowdFlower) to collect labeled data, annotations, or human judgments.

9. Public Datasets

- **Description**: Explore and utilize publicly available datasets for research or analysis purposes.
- **Practical Activities**: Identifying and downloading datasets from data repositories (e.g., Kaggle, UCI Machine Learning Repository, Data.gov) for various domains such as healthcare, finance, or education.

10. Remote Sensing Data Collection

- **Description**: Capture data from remote sensing technologies such as satellites, drones, or aerial imagery.
- **Practical Activities**: Accessing satellite imagery datasets (e.g., Landsat, Sentinel) or aerial photographs for environmental monitoring, land use classification, or disaster response applications.

BCYS302-T
Data Ethics and Privacy

UNIT-I **Marks-10**

Introduction to Data Ethics and Privacy:-Understanding the concepts of data ethics and privacy,Importance and significance of ethical considerations in data science,Historical context and evolution of data ethics and privacy regulations.

UNIT-II **Marks-10**

Ethical Issues in Data Collection and Processing:-Ethical considerations in data collection practices,Privacy implications of data processing techniques (e.g., machine learning, data mining),Case studies illustrating ethical dilemmas in data collection and processing.

UNIT-III **Marks-10**

Legal and Regulatory Frameworks:-Overview of data privacy laws and regulations (e.g., GDPR, CCPA),Ethical guidelines and professional codes of conduct in data science,

Impact of legal and regulatory compliance on data ethics and privacy practices.

UNIT-IV **Marks-10**

Ethical Data Analysis and Interpretation:-Ethical considerations in data analysis and interpretation,Bias and fairness issues in algorithmic decision-making,Techniques for ensuring transparency and accountability in data analysis.

UNIT-V **Marks-10**

Privacy-Enhancing Technologies and Practices:-Overview of privacy-enhancing technologies (PETs),Best practices for privacy-preserving data sharing and collaboration, Emerging trends and developments in data ethics and privacy.

Reference Book:

"Data and Ethics: A Guidebook for Data Scientists" by Mike Loukides and Hilary Mason.
"Ethics of Big Data: Balancing Risk and Innovation" by Kord Davis.
"Privacy, Big Data, and the Public Good: Frameworks for Engagement" by Julia Lane, Victoria Stodden, Stefan Bender, and Helen Nissenbaum.
"Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy" by Cathy O'Neil.
"Privacy in Context: Technology, Policy, and the Integrity of Social Life" by Helen Nissenbaum.

BCYS303-T
Cyber forensic analytics

UNIT-I **Marks-10**

CYBER CRIME:-Cyber Space – Cyber Crime – Criminal Behaviour – Jurisdictional Concerns - Jurisprudential Inconsistency – eCash Security – Prepaid Cards – Stored Values Cards – Mobile Payments – Internet Payment Services - Cyber stalking - Cyber extortion – Cyber terrorism - Cyber warfare –Cyber weapons -ATM frauds – Phreaking – Internet Gambling.

UNIT-II **Marks-10**

CYBER FORENSICS: Digital device – Hard disk –Disk characteristics - Disk imaging - Data Carving – Techniques – commercial piracy - soft lifting – Steganography – Network components - Port scans - Wireshark – pcap. analysis - Trojans and Backdoors – Botnets - DoS – DDoS Attacks - Honey Pots – Malware – Virus and Worms.

UNIT-III **Marks-10**

CYBER INVESTIGATION:-Concepts of Investigation - cyber investigation, Network Investigation - Investigating audit logs - Investigating Web attacks - Investigating Computer Intrusions - Profiling – Cyber Criminal profiling – Stylometric Techniques – Warranted searches – Warrantless searches – Undercover Techniques

UNIT-IV **Marks-10**

EVIDENCE MANAGEMENT:-Evidence – Digital Evidence - Types – physical evidence – Real evidence – Circumstantial evidence – network evidence - Evidence collection – Evidence Analysis - Contextual Information –Evidence Management – pre search activities – On Scene activities – Report Preparations.

UNIT-V **Marks-10**

CYBER LAWS AND AUTHORITIES:- Information Technology Act 2000 – Digital signature - Electronic Governance - Secure electronic records - Regulation of certifying authorities – CERNTin - Electronic signature certificates – Penalties compensation - Future Trends and Emerging Concerns.

TEXT BOOKS:

1.Marjie T. Britz, "Computer Forensics and Cyber Crime", Pearson, 2013.

2.GarimaTiwari, "Understanding Laws– Cyber Laws And Cyber Crimes", Lexis Nexis, 2014.

REFERENCE BOOKS:

1.ChuckEasttom, Jeff Taylor, "Computer Crime, Investigation, and the Law", Course Technology, 2018.

2.Eoghan Casey, "Digital Evidence and Computer Crime: Forensic Science, Computers, and the Internet", Eoghan Casey, 2018.

E-BOOK

1 http://index-of.es/Miscellanous/LIVRES/Syngress.Cyber.May.2014.ISBN.0128007435.pdf

2. http://index-of.es/Miscellanous/LIVRES/Syngress.Cyber.May.2014.ISBN.0128007435.pdf

MOOC

1.https://www.coursera.org/lecture/cyber-conflicts/introduction-to-cybercrime-and-fundamentalissues- xndSq.

BCYS303-P Cyber forensic LAB

Digital Evidence Collection

- **Description**: Learn the proper procedures for collecting digital evidence from computers, mobile devices, and other digital media.
- **Practical Activities**: Conducting forensic imaging of hard drives, memory cards, or USB drives using forensic tools like FTK Imager or dd command in Linux.

2. File System Forensics

- **Description**: Analyze file systems to recover deleted files, identify file timestamps, and understand file allocation.
- **Practical Activities**: Examining file system metadata, recovering deleted files, and analyzing file system artifacts using tools like Autopsy or The Sleuth Kit.

3. Network Forensics

- **Description**: Investigate network traffic to identify malicious activities, intrusion attempts, or unauthorized access.
- **Practical Activities**: Capturing and analyzing network packets using tools like Wireshark, extracting artifacts from network traffic, and reconstructing network sessions.

4. Memory Forensics

- **Description**: Analyze volatile memory (RAM) to extract information about running processes, network connections, and malware artifacts.
- **Practical Activities**: Capturing memory dumps using tools like Volatility Framework, analyzing memory artifacts for evidence of malware infections or attacker activity.

5. Mobile Device Forensics

- **Description**: Extract and analyze data from smartphones, tablets, and other mobile devices.
- **Practical Activities**: Using mobile device forensic tools like Cellebrite UFED or Oxygen Forensic Detective to extract data from iOS and Android devices, analyzing call logs, messages, and app data.

6. Forensic Data Analysis

- **Description**: Analyze digital evidence to identify patterns, anomalies, and indicators of compromise.
- **Practical Activities**: Using data analysis tools and techniques to search for keywords, analyze timestamps, and identify suspicious activities in large datasets.

7. Malware Analysis

- **Description**: Analyze malware samples to understand their behavior, functionality, and impact on systems.
- **Practical Activities**: Analyzing malware samples in controlled environments (e.g., virtual machines), using tools like IDA Pro, Ghidra, or sandboxing platforms to dissect and analyze malware behavior.

8. Email Forensics

- **Description**: Investigate email communications to trace sender identities, analyze email headers, and recover deleted messages.
- **Practical Activities**: Examining email headers, recovering deleted emails from email servers or client applications, and tracing email routes using tools like Email Header Analyzer.

9. Forensic Reporting and Documentation

- **Description**: Document forensic findings and prepare reports for legal proceedings or internal investigations.
- **Practical Activities**: Writing forensic reports that document evidence collection procedures, analysis methods, and findings in a clear and concise manner suitable for legal purposes.

10. Incident Response and Forensic Readiness

- **Description**: Prepare organizations for cyber incidents by developing incident response plans and implementing forensic readiness measures.
- **Practical Activities**: Developing incident response playbooks, conducting tabletop exercises, and implementing forensic readiness measures like logging, monitoring, and evidence preservation protocols.

BCYS304-T
Criminal laws and cyber crimes

UNIT-I **Marks-10**

Crime and Criminality:- Definitions – Vices, Sin, Tort and Crime – History of criminal law – Constitution, IPC and IEA- Nature and Scope- Doctrine of Actus Reus and Mens Rea, Elements of crime7. Evolution of Law.

UNIT-II **Marks-10**

Legal provisions in Indian Penal Code:-Crimes against property– Theft– Robbery– Dacoity. Crimes against persons: Defamation, Extortion, Bullying, Crimes against public tranquillity: Riot, Unlawful assembly.

UNIT-III **Marks-10**

Criminal Procedure Code (CrPC):- Organizational setup of courts in India. Complaint – inquiry – investigation – police report – public prosecutor – defence counsel – Arrest. Bail, Search.Seizure. Summons – Warrant – Information regarding cognizable and non-cognizable offence. Trials: Summary, Summon, and warrant trials

UNIT-IV **Marks-10**

Indian Evidence Act:-Indian Evidence Act – History in India. Evidence – Meaning, principles, and concept of relevancy and admissibility. Confessions and Dying Declaration.Presumption of fact and law, Burden of proof.

UNIT-V **Marks-10**

Information Technology Act, 2000 (amended 2008):- Relevance of IT Act- Section 63, 64, 65, 66 (all relevant section and sub sections).

RECOMMENDEDREADINGS:-

1. GuarK.D.,(1995)CriminalLaw,OxfordUniversityPressITAct,200 0-BareActwithrecentamendments
2. Kelkar,R.V.,(2003)LecturesonCriminalProcedureEasternbookCo.,Lucknow.
3. KrishnamurthyS,(1987),ImpactofSocialLegislations,ontheCriminalLawinIndia, RRPublishers,Bangalore.
4. Pillai, A.P. S., (1996) Criminal Law, N.M. Tripathi.RatanlalandDhirajlal(1995)CodeofCriminalProced ure
5. SarathyVeppaP.(1994)ElementsofLawofEvidence,EasternbookCo.,Lucknow.
6. Singh,A.,(1995)LawofEvidence,AllahabadLawagency.

BCYS305-T

Cyber risk management

UNIT-I **Marks-10**

Introduction to Cyber Risk Management:- Understanding Cyber Risk,Importance of Cyber Risk Management,Cyber Risk Assessment Frameworks,Regulatory Compliance and Standards (e.g., NIST Cybersecurity Framework, ISO/IEC 27001).

UNIT-II **Marks-10**

Cyber Threat Landscape and Risk Identification:-Overview of Cyber Threats and Actors,Threat Intelligence Sources and Analysis,Identifying and Classifying Cyber Risks,Risk Assessment Techniques (e.g., Qualitative vs. Quantitative Risk Assessment).

UNIT-III **Marks-10**

Cyber Risk Mitigation Strategies:-Risk Treatment Options (e.g., Avoidance, Mitigation, Transfer, Acceptance),Security Controls and Countermeasures,Incident Response Planning and Preparedness,Business Continuity and Disaster Recovery Planning.

UNIT-IV **Marks-10**

Cyber Risk Monitoring and Measurement:-Security Metrics and Key Risk Indicators (KRIs),Continuous Monitoring and Surveillance,Threat Hunting and Detection Techniques,Security Information and Event Management (SIEM) Systems.

UNIT-VMarks-10

Cyber Risk Governance and Compliance:-Cyber Risk Governance Frameworks,

Roles and Responsibilities of Cyber Risk Management, Legal and Regulatory Compliance,

Ethics and Professional Responsibility in Cyber Risk Management.

Reference Book: "Managing Cybersecurity Risk: Cases, Solutions, and Best Practices" by S. RaoVallabhaneni,"Cybersecurity – Attack and Defense Strategies" by Yuri Diogenes and ErdalOzkaya,"Implementing Cybersecurity: A Guide to the National Institute of Standards and Technology Risk Management Framework" by Anne Kohnke and Ken Sigler, "Measuring and Managing Information Risk: A FAIR Approach" by Jack Freund and Jack Jones,"Cyber Risk Management: A Governance, Risk, and Compliance Framework" by Atif Ahmad .

BCYS306-T
Python programming

UNIT-I **Marks-10**

Introduction to Python:-Overview of Python programming language,Basic syntax, data types, and control structures,Introduction to Python scripting and development environments.

UNIT-II **Marks-10**

Functions and Modules:-Defining and calling functions in Python,Scope and namespaces,Working with modules and packages.

UNIT-III **Marks-10**

Data Structures and Algorithms in Python:-Introduction to data structures (lists, tuples, dictionaries, sets),Implementing common algorithms in Python (sorting, searching, recursion),Analyzing algorithm efficiency (big O notation).

UNIT-IV **Marks-10**

Object-Oriented Programming (OOP) in Python:-Understanding OOP concepts (classes, objects, inheritance, polymorphism),Implementing OOP principles in Python,Design patterns and best practices in Python OOP.

UNIT-V **Marks-10**

Advanced Python Topics:-File I/O operations,Exception handling and debugging techniques,Introduction to libraries and frameworks (e.g., NumPy, Pandas, Flask).

Reference Book:

"Python Crash Course" by Eric Matthes, "Fluent Python: Clear, Concise, and Effective Programming" by Luciano Ramalho, "Problem Solving with Algorithms and Data Structures using Python" by Bradley N. Miller and David L. Ranum, "Python 3 Object-Oriented Programming" by Dusty Phillips, "Python for Data Analysis" by Wes McKinney.

BCYS306-P Python LAB

1.Web Scraping

- **Description**: Learn how to extract data from websites using libraries like BeautifulSoup or Scrapy.
- **Practical Activities**: Writing scripts to scrape data from websites, parse HTML/XML documents, and save the extracted data to a file or database.

2. Data Analysis with Pandas

- **Description**: Understand data manipulation and analysis using the Pandas library.
- **Practical Activities**: Loading and exploring datasets, performing data cleaning, filtering, aggregation, and visualization using Pandas and Matplotlib/Seaborn.

3. Machine Learning with Scikit-learn

- **Description**: Explore machine learning algorithms and techniques using the Scikit-learn library.
- **Practical Activities**: Building and training machine learning models for classification, regression, clustering, and dimensionality reduction tasks using Scikit-learn.

4. Web Development with Django or Flask

- **Description**: Learn web development by building web applications using Django or Flask frameworks.
- **Practical Activities**: Creating web applications with user authentication, CRUD operations, and RESTful APIs using Django or Flask.

5. GUI Development with Tkinter or PyQt

- **Description**: Develop graphical user interfaces (GUIs) for desktop applications using Tkinter or PyQt libraries.
- **Practical Activities**: Designing and building GUI applications with buttons, labels, input fields, and other widgets using Tkinter or PyQt.

6. Data Visualization with Matplotlib and Seaborn

- **Description**: Visualize data and create plots for exploration and presentation.
- **Practical Activities**: Creating line plots, scatter plots, histograms, heatmaps, and other visualizations using Matplotlib and Seaborn libraries.

7. Natural Language Processing (NLP) with NLTK or SpaCy

- **Description**: Process and analyze textual data using natural language processing libraries.
- **Practical Activities**: Tokenization, stemming, lemmatization, part-of-speech tagging, named entity recognition, and sentiment analysis using NLTK or SpaCy.

8. Image Processing with OpenCV

- **Description**: Perform image processing tasks such as object detection, image segmentation, and feature extraction.
- **Practical Activities**: Reading and displaying images, applying filters, detecting edges, detecting and recognizing objects in images using OpenCV.

9. Data Science Projects

- **Description**: Work on data science projects to solve real-world problems using Python.
- **Practical Activities**: Identifying and defining a problem, collecting and exploring data, performing analysis, building models, and presenting insights using Jupyter Notebooks or other tools.

10. Automation Scripts

- **Description**: Develop scripts to automate repetitive tasks and improve productivity.
- **Practical Activities**: Writing scripts for file manipulation, data processing, web automation, system administration, or any other task that can be automated using Python.