

C P PATEL AND F H SHAH COMMERCE COLLEGE (AUTONOMOUS), ANAND**(Managed by SARDAR PATEL EDUCATION TRUST, ANAND)****AFFILIATED TO SARDAR PATEL UNIVERSITY, V V NAGAR**

An ISO 9001 2015 Certified / An ISO 14001-2015 Certified / An ISO 21001-2018 Certified

GUJARAT INSTITUTIONAL RATING FRAMEWORK (4 STAR)

NAAC Reaccredited CGPA 3.56 – GRADE **A⁺** KCG-Dept of Edu. Got of Gujarat-April 2017NAAC Reaccredited - CGPA 3.30 - GRADE **‘A⁺’** UGC – MHRD, Govt of India – June 2022

Syllabus as per NEP 2020 with effect from the Academic Year 2025-2026

DEEN DAYAL UPADHYAY KAUSHAL KENDRA**BACHELOR OF VOCATION (SOFTWARE DEVELOPMENT)****SEMESTER – V**

| Subject | | Course No. | Subject Title | T/P | Credit | WCH | Exam Duration | Marking Scheme | | |
|---|--------------------------|------------|--|-----|-----------|-----|---------------|----------------|----------|--------|
| | | | | | | | | Internal | External | Total |
| Discipline Specific Course Core (Major) | Core Course-1 | BVS05MAC01 | Advanced RDBMS | T | 4 | 4 | 2 | 50/18 | 50/18 | 100/36 |
| | Core Course-2 | BVS05MAC02 | Visual Programming | T | 4 | 4 | 2 | 50/18 | 50/18 | 100/36 |
| | Practical of Core Course | BVS05MAC03 | Practical Lab of Advanced RDBMS and Visual Programming | P | 4 | 8 | 2 | 50/18 | 50/18 | 100/36 |
| Minor | Minor Course-1 | BVS05MIC04 | Software Engineering | T | 4 | 4 | 2 | 50/18 | 50/18 | 100/36 |
| | Minor Course-2 | BVS05MIC05 | Current Trends in IT | T | 4 | 4 | 2 | 50/18 | 50/18 | 100/36 |
| Skill Enhancement Course/Internship/ Dissertation | | BVS05SEC06 | Fundamental concepts of Information Security | T | 2 | 2 | 1 | 25/09 | 25/09 | 50/18 |
| Minimum Quantifying Credits | | | | | 22 | | | | | |

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**DEEN DAYAL UPADHYAY KAUSHAL KENDRA
BACHELOR OF VOCATION (SOFTWARE DEVELOPMENT)
SEMESTER – V**

| | | | |
|-----------------------------|-------------------|---------------------|-----------------------|
| Course Code | BVS05MAC01 | Title of the Course | Advanced RDBMS |
| Total Credits of the Course | 04 | Hours per Week | 04 |

| | |
|--------------------------|--|
| Course Objective: | <ol style="list-style-type: none">1. To understand advanced SQL features and procedural SQL.2. To study concurrency control and crash recovery techniques.3. To understand need of database security.4. To learn different database system architectures. |
|--------------------------|--|

| Course Content | | |
|-----------------------|--|---------------------------|
| Unit | Description | Weightage *(%) |
| 1. | Relational Database Design <ul style="list-style-type: none">– Consequences of poor database design– The process of database normalization– Functional dependencies– Lossless joins and dependency preservation– 1st Normal Form, 2nd Normal Form, 3rd Normal Form, Boyce-Codd Normal Form– Examples of normalization | 25% |
| 2. | Basics of PL/SQL <ul style="list-style-type: none">– Introduction and advantages– Understanding PL/SQL Block structure– Fundamentals of PL/SQL Language - data types (BOOLEAN, CHAR, NUMBER, DATE, VARCHAR2), variables, constants and expressions (CASE expression)– Operators (Arithmetic, Relational, Comparison, Logical, String)– Conditional statement – IF and CASE statements– Controlling loop iterations – LOOP, EXIT, EXITWHEN, WHILE, FOR– Sequential control statement – GOTO and NULL | 25% |

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|----|---|-----|
| 3. | Cursors and Exception Handling <ul style="list-style-type: none">– SELECT..INTO statement– Working with cursor : introduction, types, attributes and processing (i.e. declaring, opening, fetching and closing), using parameterized cursor, using cursor FOR loop– Error Handling : introduction, advantages of exceptions, types of exceptions– Working with user-defined exceptions – declaration,– Raise_Application_Error, Pragma Exception_Init, Sqlcode And Sqlerrm | 25% |
| 4. | Stored Subprograms, Database Triggers and Packages <ul style="list-style-type: none">– Stored procedures – introduction, creating, modifying, executing and dropping procedures– Stored functions – introduction, creating, modifying, executing and dropping functions– Database triggers – introduction, creating, modifying and dropping triggers, types of triggers– Packages – meaning, advantages, creating, modifying and dropping | 25% |

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| Teaching-Learning Methodology | Blended learning approach incorporating both traditional classroom teaching as well as usage of ICT tools. |
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| Evaluation Pattern | | |
|---------------------------|---|-----------------------|
| Sr. No. | Details of the Evaluation | Weightage *(%) |
| 1. | Internal Written/Practical Examination | 50% |
| 2. | Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments. | |
| 3. | External Examination | 50% |

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| Course Outcomes: Having completed this course, the learner will be able to | |
|--|---|
| 1. | Understand relational database design, normalization and ER diagrams. |
| 2. | Work with PL/SQL, cursors, stored procedures and functions. |

| Suggested References: | |
|-----------------------|---|
| Sr. No. | References |
| 1. | RDBMS In-Depth by Dr. Madhavi Vaidya, Publication Date: 2021 |
| 2. | RDBMS In-Depth by BPB Publications (2021). |
| 3. | Ivan Bayross: SQL, PL/SQL The programming language of Oracle, 4th edition, BPB Publications , was released in 2009. |
| 4. | Understanding Database Management Systems : S. Parthsarthy and B.W. Khalkar, First edition 2007, Master Academy |
| 5. | P. S. Deshpande: SQL/PLSQL for Oracle9i, dreamtech press, reprint edition 2009. |
| 6. | Buluksu Lakshman: Oracle9i PL/SQL: A developer's guide, Apress, edition 2003. |

| On-line resources to be used if available as reference material | |
|---|---|
| 1. | https://www.tutorialspoint.com/ |
| 2. | https://www.w3schools.com/ |
| 3. | https://www.javatpoint.com/ |

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DEEN DAYAL UPADHYAY KAUSHAL KENDRA
BACHELOR OF VOCATION (SOFTWARE DEVELOPMENT)
SEMESTER – V

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|-----------------------------|-------------------|---------------------|---------------------------|
| Course Code | BVS05MAC02 | Title of the Course | Visual Programming |
| Total Credits of the Course | 04 | Hours per Week | 04 |

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| Course Objective: | <ol style="list-style-type: none"> 1. To understand .NET Framework and describe some of the major enhancements to the new version of Visual Basic. 2. To describe the basic structure of a Visual Basic.NET project and use main features of the Integrated Development Environment (IDE). 3. To understand how to create applications using Microsoft Windows Forms. 4. To understand Exception handling. 5. To understand and create applications that use ADO. NET |
|--------------------------|--|

| Course Content | | |
|-----------------------|---|---------------------------|
| Unit | Description | Weightage *(%) |
| 1. | Introduction to .NET Framework and VB.NET <ul style="list-style-type: none"> – .NET Architecture, – .NET Languages, Microsoft Intermediate Language (MSIL), – The Just-In-Time (JIT) compiler, – Working with Assemblies, – The .NET framework class library – VB.NET introduction – Applications and types of project – Introduction to Visual Studio IDE – Creating simple Windows Application using VB.NET – Variables, data types, constants and operators, – Type casting, Boxing and Unboxing, – Working with arrays and strings – Creating simple Windows Application using VB.NET | 25% |
| 2. | Fundamentals of VB.NET <ul style="list-style-type: none"> – VB.NET Basics Use of conditional statement | 25% |

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| | <ul style="list-style-type: none">– Multi branching statement (select) and With...End With statement– Looping Statement– Working with EXIT, CONTINUE and WITH statements– Working with procedures – introduction, types, use of parameters, parameter passing, calling procedures– OOP concepts (Encapsulation, Inheritance, Polymorphism, Abstraction)– Working with modules, classes (partial) and namespaces– Working with Windows Forms – introduction– Life cycle, basic properties, methods and events– Use of simple windows forms control– Working with SDI and MDI forms | |
| 3. | Developing Windows Forms, Exception Handling <ul style="list-style-type: none">– Working with basic controls (Button, CheckBox, CheckedListBox, ComboBox, DateTimePicker, GroupBox, HScrollBar, RadioButton, VscrollBar, Label, ListBox, PictureBox, TextBox and Timer control)– Working with advanced controls (LinkLabel, RichTextBox, ColorDialog, FontDialog, TreeView, Error Provider Control)– Working with modules, classes (partial) and namespaces– Error Handling: exception, structured exception using try...catch and final statement | 25% |
| 4. | Database with ADO.NET <ul style="list-style-type: none">– ADO.NET – introduction and applications– ADO.NET – architecture (connected & disconnected)– Persisting Data Using Databases and Files– Database connectivity using ADO.NET Use of Data sources– Server Explorer and working with DataSet– Populating data in a DataGridView– Working with report | 25% |

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| Teaching – Learning Methodology | Blended learning approach incorporating both traditional classroom teaching as well as usage of ICT tools |
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| Evaluation Pattern | | |
|---------------------------|---|---------------------------|
| Sr. No. | Details of the Evaluation | Weightage *(%) |
| 1. | Internal Written/Practical Examination | 50% |
| 2. | Internal Continuo us Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance | |
| 3. | External Examination | 50% |

| Course Outcomes : Having completed this course, the learner will be able to | |
|--|--|
| 1. | The .NET Framework and describe some of the major enhancements to the new version of Visual Basic. |
| 2. | The basic structure of a Visual Basic.NET project and use main features of the integrated development environment (IDE). |
| 3. | How to create applications using Microsoft Windows Forms. |
| 4. | The basic concepts related to Exception handling. |
| 5. | How to develop applications that use ADO. NET. |

| Suggested References: | |
|------------------------------|---|
| Sr. No. | References |
| 1. | Francesco Balena : Programming Microsoft Visual Basic.NET, Microsoft Press, Bill Evjen, Billy Hollis, Bill Sheldon, Kent Sharkey and Tim McCarthy: Professional VB 2005 with .NET 3.0 |
| 2. | Steven Holzner; VB.NET Black Book by Dreamtech publication 2005. |

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| On-line resources to be used if available as reference material |
| 1. https://www.tutorialspoint.com/ |
| 2. https://www.w3schools.com/ |
| 3. https://www.javatpoint.com/ |

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DEEN DAYAL UPADHYAY KAUSHAL KENDRA BACHELOR OF VOCATION (SOFTWARE DEVELOPMENT) SEMESTER – V

| | | | |
|-----------------------------|-------------------|---------------------|---|
| Course Code | BVS05MAC03 | Title of the Course | Practical Lab of Advanced RDBMS and Visual Programming |
| Total Credits of the Course | 04 | Hours per Week | 04 |

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|---------------------------|---|
| Course Objectives: | <ol style="list-style-type: none">1. To understand the practical usage of Database Management Systems.2. To understand implementing problems using Visual Basic.NET3. To understand implementing database programming using ADO.NET |
|---------------------------|---|

| Course Content | | |
|-----------------------|--|-----------------------|
| Unit | Description | Weightage *(%) |
| 1. | Practical based on Advanced RDBMS . | 50% |
| 2. | Practical based on Visual Programming . | 50% |

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|--|---|
| Teaching - Learning Methodology | Project-based learning in small groups and Hands on training through required ICT tools |
|--|---|

| Evaluation Pattern | | |
|---------------------------|--|-----------------------|
| Sr. No. | Details of the Evaluation | Weightage *(%) |
| 1. | Internal Written/Practical Examination | 50% |
| 2. | Internal Continuous Assessment in the form of Practical, Viva - voce, Quizzes, Seminars, Assignments, Attendance | |

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| | | |
|----|----------------------|-----|
| 3. | External Examination | 50% |
|----|----------------------|-----|

| Course Out comes : Having completed this course, the learner will be able to | |
|--|---|
| 1. | Gain knowledge in implementing problems using Visual Basic.NET |
| 2. | Gain knowledge in implementing database programming using ADO.NET |
| 3. | Apply the knowledge of Database Management Systems. |

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DEEN DAYAL UPADHYAY KAUSHAL KENDRA
BACHELOR OF VOCATION (SOFTWARE DEVELOPMENT)
SEMESTER – V

| | | | |
|-----------------------------|-------------------|---------------------|-----------------------------|
| Course Code | BVS05MIC04 | Title of the Course | Software Engineering |
| Total Credits of the Course | 04 | Hours per Week | 04 |

| | |
|---------------------------|--|
| Course Objectives: | 1. To understand system concepts. 2. Know about software engineering and its application in Software development. |
|---------------------------|--|

| Course Content | | |
|-----------------------|--|-----------------------|
| Unit | Description | Weightage *(%) |
| 1. | Introduction to Software Engineering <ul style="list-style-type: none"> – Introduction to Software and Software Engineering – Software Process characteristics – Software development Phases – Process Models (Waterfall, Prototype, Iterative enhancement, Spiral Model) – Introduction to Agile Methodology | 25% |
| 2. | Requirement Specification and Software Project Planning <ul style="list-style-type: none"> – Introduction: SRS and Needs – Problem Analysis: – Requirement Specifications: – Characteristics & Components of SRS – Specification Languages (Structured English, Regular Expressions & Decision Tables) – Structure of SRS – Validation of SRS – Introduction to software projects, Planning, Categories of Software projects – Overview of Cost estimation, Uncertainty in cost estimation, size estimation – COCOMO Model (with example) | 25% |

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| | <ul style="list-style-type: none">– Project Monitoring Plan (Time sheets, Reviews, Cost-Schedule Milestone, Earned Value Method)– Software Quality Assurance Plans (SQAP)– Overview of Risk Management | |
| 3. | Software Design <ul style="list-style-type: none">– Introduction: System Design, Design Objectives, Design Principles/Concepts– Top Down & Bottom Up approach– Problem Partitioning Abstraction– Modularity Module Level concept, Coupling, Cohesion– Overview of Structured design– Functional v/s Object-oriented approach– Design Specification, Verification– Introduction: Detailed Design, Module Specification and its Desirable Properties, Functional module Specification, Data Abstraction Specification– Verification - Design Walkthrough, Critical Design, review, Consistency checkers | 25% |
| 4. | Coding and Testing <ul style="list-style-type: none">– Introduction: Coding, Top Down & Bottom Up Approach for coding– Structured Programming, Information Hiding– Programming Style– Internal Documentation– Verification (Code Reading ONLY)– Introduction: Testing, Error, Fault, Failure & Reliability– Testing Process,– Top down and bottom up approach for testing– Levels of Testing– Functional Testing v/s Structural Testing | 25% |
| Teaching-Learning Methodology | Blended learning approach incorporating both traditional classroom teaching as well as usage of ICT tools. | |

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| Evaluation Pattern | | |
|--------------------|---|-------------------|
| Sr. No. | Details of the Evaluation | Weightage *(%) |
| 1. | Internal Written/Practical Examination | 50% |
| 2. | Internal Continuous Assessment in the form of Practical, Viva -voce, Quizzes, Seminars, Assignments, Attendance | |
| 3. | External Examination | 50% |

| Course Outcomes : Having completed this course, the learner will be able to | |
|---|---|
| 1. | Understanding of the fundamental concepts related to software engineering, different phases of software development and various process models. |
| 2. | Understanding of the basic concepts related to requirement specification and software project planning. |
| 3. | Basic knowledge about the concepts related to system design, coding and testing. |

| Suggested References: | |
|-----------------------|---|
| Sr. No. | References |
| 1. | Software Engineering Fundamentals by Richard Fairley, Tata McGraw- Hill released in 2001. |
| 2. | An Integrated Approach to Software Engineering by PankajJalote ,Narosa Publishing House, Second Edition,1997. |
| 3. | Software Engineering, By Ian Sommerville, Addition-Wesley, Fifth Edition, 2000. |
| 4. | Software Engineering a practitioner's approach by Roger S. Pressman, Tata McGrawHill, Fifth Edition, 2001. |

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| On-line resources to be used if available as reference material | |
| 1. | https://www.tutorialspoint.com/ |
| 2. | https://www.w3schools.com/ |
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BACHELOR OF VOCATION (SOFTWARE DEVELOPMENT)
SEMESTER – V**

| | | | |
|-----------------------------|-------------------|---------------------|-----------------------------|
| Course Code | BVS05MIC05 | Title of the Course | Current Trends in IT |
| Total Credits of the Course | 04 | Hours per Week | 04 |

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| Course Objectives: | 1. To acquire knowledge about recent trends in Information Technology. 2. To study the basic concepts related to Artificial Intelligence, machine learning, Big Data and cloud computing. |
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| Course Content | | |
|-----------------------|--|---------------------------|
| Unit | Description | Weightage *(%) |
| 1. | Artificial Intelligence <ul style="list-style-type: none">– Introduction to AI– AI and Related Fields– Advantage and Disadvantage of AI– Applications of AI– Expert Systems– Introduction to Fuzzy Logic– Fuzzification and Defuzzification | 25% |
| 2. | Machine Learning <ul style="list-style-type: none">– Types of learning: Human and machine learning– Advantages and disadvantages of machine learning– Examples of machine learning applications– Types of machine learning techniques (Supervised, Unsupervised)– Reinforcement | 25% |
| 3. | Big Data <ul style="list-style-type: none">– Introduction of Big Data– Unstructured Data, Semi-Structured Data and Structured Data– Characteristics of Big Data | 25% |

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|----|--|-----|
| | <ul style="list-style-type: none">– Need of Big Data– Importance of Big Data | |
| 4. | Cloud Computing <ul style="list-style-type: none">– Introduction to Cloud computing– Benefits –Limitations of Cloud Computing– Characteristics of cloud computing– Applications of Cloud Computing– Cloud Deployment Model– Cloud Service Models | 25% |

| | |
|--------------------------------------|---|
| Teaching-Learning Methodology | Blended learning approach incorporating traditional classroom teaching as well as online / ICT-based teaching practices |
|--------------------------------------|---|

| Evaluation Pattern | | |
|---------------------------|--|---------------------------|
| Sr. No. | Details of the Evaluation | Weightage *(%) |
| 1. | Internal Written/Practical Examination | 50% |
| 2. | Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance | |
| 3. | External Examination | 50% |

| Course Out comes : Having completed this course, the learner will be able to | |
|---|---|
| 1. | Knowledge about recent trends in Information Technology. |
| 2. | Understanding of the basic concepts related to Artificial Intelligence, Machine Learning, Big Data and cloud computing. |

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GUJARAT INSTITUTIONAL RATING FRAMEWORK (4 STAR)

NAAC Reaccredited CGPA 3.56 – GRADE **A⁺** KCG-Dept of Edu. Govt of Gujarat-April 2017

NAAC Reaccredited - CGPA 3.30 - GRADE **'A⁺'** UGC – MHRD, Govt of India – June 2022

Syllabus as per NEP 2020 with effect from the Academic Year 2025-2026

| Suggested References : | |
|------------------------|--|
| Sr. No. | References |
| 1. | Bart Baesens, Analytics in a Big Data World first published in May 2014 by Wiley. |
| 2. | Sridhar Alla, Big Data Analytics with Hadoop 3, Ingram, 2018. |
| 3. | Artificial Intelligence: A Modern Approach, Stuart Russel, Peter Norvig, PHI published in 2020. |
| 4. | The Art of SEO: Mastering Search Engine Optimization by Eric Enge, Stephan published in September 2023 |

| On-line resources to be used if available as reference material | |
|---|---|
| 1. | https://www.tutorialspoint.com/ |
| 2. | https://www.w3schools.com/ |
| 3. | https://www.javatpoint.com/ |

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Syllabus as per NEP 2020 with effect from the Academic Year 2025-2026

**DEEN DAYAL UPADHYAY KAUSHAL KENDRA
BACHELOR OF VOCATION (SOFTWARE DEVELOPMENT)
SEMESTER – V**

| | | | |
|-----------------------------|-------------------|---------------------|---|
| Course Code | BVS05SEC06 | Title of the Course | Fundamental concepts of Information Security |
| Total Credits of the Course | 02 | Hours per Week | 02 |

| | |
|---------------------------|---|
| Course Objectives: | <ol style="list-style-type: none">1. To prepare students to understand security basics.2. Understand cryptography and the principles and system security.3. Understand common attacking techniques such as virus, rojan, worms and common security policies and the basic cryptography. |
|---------------------------|---|

| Course Content | | |
|-----------------------|--|---------------------------|
| Unit | Description | Weightage *(%) |
| 1. | Introduction of Information Security and Cryptography <ul style="list-style-type: none">– Introduction of Information Security– Security Attacks– Security Services– Network Security Model– Introduction of Cryptography– Conventional Encryption principles– Substitution Ciphers vs. Transposition Ciphers– Types of Attack on Encrypted Messages– Introduction of Symmetric and Asymmetric Key Cryptography | 50 % |
| 2. | Concept of System Security and Network Security <ul style="list-style-type: none">– Intruders (Masquerader, Misfeasor, Clandestine User)– Intruder Behavior Patterns (Hacker, Criminal, Insider Attack)– Viruses and related threats (Trap Doors, Logic Bombs, Trojan Horses, Viruses, Worms)– Antivirus approaches : Detection, Identification and Removal– Concept of Digital Signatures | 50 % |

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| | | |
|--|---|--|
| | <ul style="list-style-type: none">– Introduction of Firewall– Need for Firewall– Characteristics of Firewall– Principles of Firewall– Types of Firewall | |
|--|---|--|

| | |
|--------------------------------------|---|
| Teaching-Learning Methodology | Blended learning approach incorporating traditional classroom teaching as well as online / ICT-based teaching practices |
|--------------------------------------|---|

| Evaluation Pattern | | |
|---------------------------|--|---------------------------|
| Sr. No. | Details of the Evaluation | Weightage *(%) |
| 1. | Internal Written/Practical Examination | 50% |
| 2. | Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance | |
| 3. | External Examination | 50% |

| Course Out comes : Having completed this course, the learner will be able to | |
|---|---|
| 1. | Understand the principles and practices of cryptographic techniques. |
| 2. | Understand a variety of generic security threats and vulnerabilities, and identify & analyze particular security problems for given applications. |

| Suggested References: | |
|------------------------------|---|
| Sr. No. | References |
| 1. | Tanenbaum A. S., Computer Networks, Prentice-Hall of India Pvt. Ltd., New Delhi, 1997. |
| 2. | William Stallings: Network Security Essentials (Applications and Standards), Pearson Education India, 2001. |

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| | |
|---|---|
| On-line resources to be used if available as reference material | |
| 1. | https://www.tutorialspoint.com/ |
| 2. | https://www.w3schools.com/ |
| 3. | https://www.javatpoint.com/ |