

# **Bachelor of Information Technology (BIT)**

## **Course Curriculum**

**Faculty of Education & Social Sciences  
Bagmati Province University (BPU)  
Hetauda**

**2025**

## **Introduction**

The Bachelor of Information Technology (BIT) is a comprehensive undergraduate degree program designed to equip students with the theoretical knowledge and practical skills required in the field of Information Technology. This program focuses on equipping students with a strong foundation in theoretical knowledge and practical skills related to the design, development, management, and implementation of IT solutions. This program also focuses on the study of systemic approaches to select, develop, apply, integrate, and administer secure computing technologies to enable users to accomplish their personal, organizational, and societal goals. The BIT program is ideal for students passionate about technology and its applications in solving real-world problems. It opens doors to dynamic, high-demand careers in the IT sector and provides the tools needed to thrive in a tech-driven world.

## **Objectives**

The objectives of the BIT program are as follows:

- Prepare students for successful careers in the IT industry by equipping them with technical, analytical, and managerial skills.
- Equip students with a strong foundation in programming, networking, database management, and software development.
- Enable proficiency in the use of modern IT tools, technologies, and frameworks.
- Teach students to analyze complex problems and develop effective IT solutions.
- Encourage innovative thinking and the application of technology to real-world challenges.
- Provide hands-on training through lab sessions, internships, and projects to build job-ready skills.
- Emphasize ethical practices, professional communication, and teamwork in IT project environments.
- Expose students to the latest trends in IT and rapid evolution of technology.
- Develop leadership and entrepreneurial skills for roles in IT management and innovation-driven startups.
- Enable understanding of the societal and global impact of IT solutions.

## **Eligibility Criteria**

The candidate applying for admission to the BIT program must have

- Completed twelve years of schooling or its equivalent by the Nepal Government.
- Attained at least second division in the 10 + 2, PCL, or equivalent program, or received minimum D+ grade in each of the subjects in grades 11 and 12 with minimum CGPA of 1.80.
- Completed all application requirements.
- Obtained pass marks in the entrance examination taken from the University.

## **Duration and Total Credit Hours**

- **Duration:** The duration of the BIT program is four (4) years, divided into eight (8) semesters.
- **Total Credit Hours:** 124 credit hours

## **Instructional Techniques**

The BIT program employs a student-centered learning approach. The program's teaching methodology encompasses interactive lectures, student presentations, seminars, case studies, practical and project works. The faculty will identify the most appropriate instructional and educational methods for each course. Integrating technology and digital pedagogy is essential in the teaching-learning process, ensuring that students are adequately prepared for contemporary educational challenges.

## **Projects and Internship**

Students are required to develop real world software application, utilizing their knowledge and skills in related areas. They will also develop a project report that contains the detail of development steps during project development.

Students are required to complete internship work in various companies and organizations that develop or use IT systems. Every student will work on actual projects during this time, gaining hands-on experience in their field. Students must write an individual project report outlining their work and contributions to the organization in the format specified. Internship report, depth of the work done and presentation of their findings will be considered for the evaluation of the internship.

## **Attendance**

The BIT program is an intensive professional course that requires a high level of commitment from students. Regular attendance in all classes and presentations is mandatory. Students must attend at least 80% of all scheduled classes; those who fail to meet this requirement will not be permitted to sit for the semester-end examinations.

## **Evaluation**

All the courses except project work and internship should be evaluated through internal evaluation and end-semester examination. The 40% of the overall weight will be assigned for internal evaluation and remaining 60% will be assigned for end-semester examination. The overall internal evaluation will be conducted by the subject teacher through internal examinations, different classroom activities, projects, field works, and seminars. The end-semester examination will be conducted by the University. The final grade and grade point in each course will be the sum of overall weightage of in all categories.

For the courses having laboratory work, 25% of the overall final evaluation will be assigned for final practical examination. The university will invite a subject expert for the evaluation of practical examination.

Project works and internship are evaluated by different evaluators. To pass these courses, students should secure minimum pass marks in the evaluation of each evaluator and the final grade and

grade point will be the sum of all these evaluations. For the final evaluation, an external examiner will be assigned.

<b>Evaluation scheme for theory only courses</b>				
<b>Internal Evaluation</b>	<b>Weight</b>	<b>Marks</b>	<b>External Evaluation</b>	<b>Marks</b>
Attendance & Class Participation	10%	4	Final theory examination	60
Homework / Assignments	20%	8		
First-term examination	20%	8		
Second-term examination	25%	10		
Project work / Case study / Presentation / Lab work	25%	10		
<b>Total Internal</b>	100%	40	<b>Total External</b>	60
Full Marks: 40 + 60 = 100				

<b>Evaluation scheme for theory + lab courses</b>				
<b>Internal Evaluation</b>	<b>Weight</b>	<b>Marks</b>	<b>External Evaluation</b>	<b>Marks</b>
Attendance & Class Participation	10%	4	Final theory examination	45
Homework / Assignments	20%	8	Final practical examination	15
First-term examination	20%	8		
Second-term examination	25%	10		
Project work / Case study / Presentation	25%	10		
<b>Total Internal</b>	100%	40	<b>Total External</b>	60
Full Marks: 40 + 45 + 15 = 100				

**Final theory examination question pattern for theory only courses (3 Hours):**

- Short Questions: Remembering, Understanding and Applying Level (8 questions × 5 marks each = 40 marks) with 2 OR Questions.
- Long Questions: Higher Ability Level (2 questions × 10 marks each = 20 marks) with 1 OR Question.

**Final theory examination question pattern for theory and lab courses (2 Hours):**

- Short Questions: Remembering, Understanding and Applying Level (7 questions × 5 marks each = 35 marks) with 2 OR Questions.
- Long Questions: Higher Ability Level (1 question × 10 marks each = 10 marks) with 1 OR Question.

**Final lab examination evaluation:**

- The final lab examination will be evaluated on the basis of lab examination, lab sheets, and viva voce. The marks allocated is 5, 5, and 5 for lab exam, lab sheets, and viva voce respectively.

**Passing Grade and Grading System**

The test administered by Bagmati Province University serves as the final assessment of the students. To be eligible to take semester exam, students must receive at least a 'B' or a grade point Average (GPA) of 3.00 in the internal evaluation. A minimum grade of 'B' or CGPA of 3.00 is required of the student in order to pass the semester exam. The following will be the grading scheme:

<b>Letter Grade</b>	<b>Cumulative Grade Point Average (CGPA)</b>	<b>Marks Obtained in Percent</b>	<b>Divisions / Remarks</b>
A	4	90-100	Distinction
A-	3.7-3.99	80-89.9	Very Good
B+	3.3- 3.69	70-79.9	First Division
B	3.00 - 3.29	60 - 69.9	Second Division
B-	2.70 - 2.99	50 - 59.9	Pass in Individual Subject
F	Below 2.70	Below 50	Fail

**Make up/ Retake Exam**

Make up/Retake examination shall be conducted as per the semester guideline.

## Course Cycle

The BIT program is a four-year course divided into eight semesters. Each semester lasts 16 weeks and involves intensive study. The program covers 124 credit hours and includes different courses related to information technology, some interdisciplinary courses, project works, and internship.

<b>Semester I</b>			
<b>S.N.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>
1	BIT411	Foundations of Information Technology	3
2	BIT412	Programming in C	3
3	BIT413	Digital Logic	3
4	BIT414	Mathematics	3
5	BIT415	Economics	3
<b>Total Credit Hours</b>			<b>15</b>
<b>Semester II</b>			
<b>S.N.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>
1	BIT421	Object-oriented Programming	3
2	BIT422	Computer Architecture	3
3	BIT423	Discrete Structure	3
4	BIT424	Statistics	3
5	BIT425	Communication Skills	3
<b>Total Credit Hours</b>			<b>15</b>
<b>Semester III</b>			
<b>S.N.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>
1	BIT431	Python Programming	3
2	BIT432	Data Structure and Algorithms	3
3	BIT433	Database Management System	3
4	BIT434	Web Technology I	3
5	BIT435	Society and Information Technology	3
<b>Total Credit Hours</b>			<b>15</b>
<b>Semester IV</b>			
<b>S.N.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>
1	BIT441	Operating System	3
2	BIT442	System Analysis and Design	3
3	BIT443	Web Technology II	3
4	BIT444	Artificial Intelligence	3
5	BIT445	Technical Writing	3
6	BIT446	Project I	2
<b>Total Credit Hours</b>			<b>17</b>
<b>Semester V</b>			
<b>S.N.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>
1	BIT451	Software Project Management	3
2	BIT452	Mobile Application Development	3

3	BIT453	Database Administration	3
4	BIT454	.Net Development	3
5	BIT455	Principles of Management	3
6	BIT456	Project II	2
<b>Total Credit Hours</b>			<b>17</b>
<b>Semester VI</b>			
<b>S.N.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>
1	BIT461	Computer Network and Data Communication	3
2	BIT462	Business Information Systems	3
3	BIT463	E-Commerce and Digital Marketing	3
4	BIT464	Digital Governance	3
5	BIT465	Psychology	3
<b>Total Credit Hours</b>			<b>15</b>
<b>Semester VII</b>			
<b>S.N.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>
1	BIT471	GIS and Remote Sensing	3
2	BIT472	Information Security	3
3	BIT473	Machine Learning	3
4	BIT474	Major Project	3
5		Elective I	3
<b>Total Credit Hours</b>			<b>15</b>
<b>List of Courses for Elective I</b>			
<ol style="list-style-type: none"> <li>1. Computer Graphics and Animation (BIT511)</li> <li>2. Internet of Things (BIT512)</li> <li>3. IT Entrepreneurship and Innovation (BIT513)</li> <li>4. Big Data Technologies (BIT514)</li> <li>5. Human Computer Interaction (BIT515)</li> <li>6. Emerging Technologies (BIT516)</li> </ol>			
<b>Semester VIII</b>			
<b>S.N.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>
2	BIT481	Cloud Computing	3
3	BIT482	Internship	6
4		Elective II	3
5		Elective III	3
<b>Total Credit Hours</b>			<b>15</b>
<b>List of Courses for Elective II &amp; Elective III</b>			
<ol style="list-style-type: none"> <li>1. Cyber Security and Ethics (BIT517)</li> <li>2. Digital Economy (BIT518)</li> <li>3. Information System Auditing (BIT519)</li> <li>4. Game Development (BIT5120)</li> <li>5. Natural Language Processing (BIT521)</li> </ol>			

6. DevOps (BIT522) 7. Computer Vision (BIT523) 8. Data Warehousing and Data Mining (BIT524) 9. Software Quality Assurance (BIT525) 10. Network and System Administration (BIT526) 11. Deep Learning (BIT527)	
---	--

## SEMESTER-WISE DETAILED SYLLABUS

### Semester I

**Course Title:** Foundations of Information Technology

**Nature of the Course:** Theory + Lab

**Semester:** I

**Course Code:** BIT411

**Credit Hours:** 3

**Total Hours:** 48

#### **Course Description:**

This course provides the basic concepts of computers, including hardware, memory, input/output devices, and software. It covers data representation, including number systems and binary arithmetic. The course also provides an overview of operating systems, computer networks, the internet, and computer security. Students will also gain an understanding of IT applications and their societal impact. The laboratory component offers practical experience with hardware, operating systems, application packages, the internet and security issues.

#### **Course Objectives:**

The main objective of this course is to provide students with a comprehensive understanding of different concepts of information technology, including hardware, software, networks, Internet, IT applications, security, and social impact.

#### **Learning Outcomes:**

Upon successful completion of this course, students will be able to:

- Explain the fundamental concepts of computer systems and their constituent components.
- Gain basic knowledge of operating system principles and functionalities.
- Acquire foundational knowledge of computer networks, the internet, and essential computer security concepts.
- Describe the diverse applications of Information Technology and its societal implications.

#### **Course Contents:**

##### **Unit 1: Introduction to Computer (6 Hrs.)**

Introduction of Computer System, Classification of Computers, Computer Applications, Concept of Computer Organization, Central Processing Unit (CPU), Concept of Microprocessor, Computer Bus, Ports and Interfaces in Computer System, Input/Output Devices, I/O Unit and I/O System, Instruction Format and Instruction Set

##### **Unit 2: Memory, Storage, and Data Representation in Computers (8 Hrs.)**

Memory Representation, Memory Hierarchy, CPU Registers, Cache Memory, Primary Memory (RAM and ROM), Secondary Memory, Hard Disk Drive, Optical Disk (CD/DVD) and Flash Memory Devices (USB drives, SSDs). Introduction to **Number System (decimal, binary, octal, and hexadecimal), Conversion between Number Systems** (decimal to binary, binary to hexadecimal). **Binary Arithmetic** (addition, subtraction, multiplication, division)

##### **Unit 3: Computer Software and Operating System Concepts (12 Hrs.)**

Types of Software (System Software, Application Software), Introduction to Operating System: Defining the operating system and its fundamental role, Functions of Operating System, Types of Operating System, Booting Process, Working Knowledge of GUI-based Operating System, Software Licensing and Open Source Software, Application packages, Key features of word processor, spread sheet and presentation package

**Unit 4: Computer Network and Data Communication (6 Hrs.)**

Concept of Computer Network, Data Transmission Media, Computer Network, Network Topology, Communication Protocol (TCP/IP, HTTP, FTP), Network Devices, Wireless Networking (Wi-Fi and Bluetooth)

**Unit 5: The Internet, Web Technologies, and Emerging IT Trends (10 Hrs.)**

Concept of Internet, Internet Protocol (TCP/IP), The Internet Architecture, World Wide Web (WWW), Basic Internet Terminology( URL, HTTP, FTP, domain name, and IP address), Internet Services(email, search engines, e-commerce, e-governance, e-learning, e-banking, social networking, and cloud computing, Emerging Trends in IT(Internet of Things (IoT), Wearable Computing, Cloud Computing, Web 2.0), Ethics in use internet (Netizen and Netiquitee)

**Unit 6: IT Applications, Security, and Societal Impact (6 Hrs.)**

Applications of IT in Various Domains, Chatbots and Generative AI and their application, Societal Impacts of IT, Impact of AI in Society, Computer Security Threats and Attacks, Security Mechanisms, Information Security and Ethical Considerations

**Laboratory Works:**

The laboratory work includes realizing hardware components of computers, using operating systems, word processors, spreadsheets, presentation graphics, and the internet and its services.

**Text Book:**

Sinha, P. K., & Sinha, P. (2015). *Computer Fundamentals: Concepts, Systems & Applications* (8th ed.). BPB Publications. ISBN:9788176567527.

**Reference Books:**

Rajaraman, V. (2020). *Fundamentals of computers* (7th ed. Third edition, seventeenth printing). PHI Learning. ISBN: 978-8120351852.

Norton, P., & Goel, A. (2019). *Introduction to computers* (7th ed.). Tata McGraw-Hill Education. ISBN: 978-9387067028.

Arora, A. (2018). *Computer Fundamentals and Applications*. ISBN: 9789325971608.

<https://learn.microsoft.com/>

<https://workspace.google.com/learning-center/>

<https://edu.gcfglobal.org/>

<https://www.datacamp.com/>

**Course Title:** Programming in C  
**Nature of the Course:** Theory + Lab  
**Semester:** I

**Course Code:** BIT412  
**Credit Hours:** 3  
**Total Hours:** 48

**Course Description:**

This course introduces the concepts of C programming. It covers basic elements of C along with the operators, input output statements, control statements, functions, arrays, strings, pointers, structures and file handling.

**Course Objectives:**

The main objective of this course is to familiarize students with different concepts of C programming including language preliminaries, control statements, functions, arrays, pointers, structures and unions, and file handling.

**Learning Outcomes:**

Upon successful completion of this course, students will be able to:

- Understand the basic concepts of programming language
- Know basics of C programming
- Able to write C program using various constructs in C
- Implement real world problems using C programming language

**Course Contents:**

**Unit 1: Introduction (5 Hrs.)**

Concepts of Programming; Programming Language; Types of programming languages; Structure of C Program; Compilation of C Program; C Standards; Character Set; Tokens; Escape Sequence; Delimiters; Variables; Data types; Constants; Variables; Expressions; Statements; Symbolic Constants; Comments; Preprocessor Directives

**Unit 2: Operators and Expressions (4 Hrs.)**

Arithmetic Operators; Unary Operators; Relational and Logical Operators; Assignment Operators; The Conditional Operator; sizeof Operator; Operator Precedence; Expression and Its Evaluation; Type Conversion

**Unit 3: Data Input and Output (4 Hrs.)**

Input/output operations, Conversion specifications, Formatted Input Output; Unformatted Input Output

**Unit 4: Control Statements (6 Hrs.)**

Branching statements: IF Statements; Looping statements: For, While, and Do-while; Nested Control Structures, The Statement; Break Statement; The Continue Statement, The Comma Operator; The goto Statement

**Unit 5: Functions (6 Hrs.)**

Function; Library Function; User Defined Function; Defining a Function; Accessing a Function; Function Prototypes; Passing Arguments to Function; Recursion; Automatic Variables; Global Variables; Static Variables

**Unit 6: Arrays (5 Hrs.)**

Defining Array; Types of array: Single dimensional and Multidimensional; Array Declaration; Array Initialization; Passing Arrays to Functions

**Unit 7: Strings (4 Hrs.)**

Character Array; Strings; String Definition; Null Character; String Initialization; Reading and Writing Strings; Processing Strings; Passing Strings to Functions; Library Functions for Strings

**Unit 8: Pointers (5 Hrs.)**

Basics of Pointer; The & and \* Operators; Pointer Declaration; Pointer to Pointers; Pointers and Arrays; Dynamic Memory Allocation; Pointer Arithmetic; Operations on Pointers; Pointers and Character Strings, Array of Pointers, Passing and Returning Pointers to/from a Function

**Unit 9: Structure and Union (5 Hrs.)**

Defining a Structure; Processing a Structure; Structures and Pointers; Array of Structure; Passing Structures to Function; Self-Referential Structures; Pointer and Structures; Unions

**Unit 10: File Handling (4 Hrs.)**

File, Text and Binary Files; File Modes; Opening and Closing of File; Reading and Writing File; Accessing the File Randomly

**Laboratory Works:**

The laboratory work includes writing C programs for implementing the concepts mentioned in above chapters.

**Text Book:**

Gottfried, B. (2018). *Programming with C*. 4<sup>th</sup> Edition. McGraw Hill Education.

**Reference Books:**

Kelley, A. & Pohl, I. (1998). *A Book on C*. 4<sup>th</sup> Edition. Pearson Education.

Kernighan, K.A. & Ritchie, D.M. (1988). *The C programming Language*. 2<sup>nd</sup> Edition, PHI Publication.

Balagurusamy, E. (2019). *Programming in ANSI C*, 8<sup>th</sup> Edition. TMH publication.

Schildt, H. (2000). *C: The Complete Reference*. 4<sup>th</sup> Edition. Osborne/McGraw-Hill Publication.

**Course Title:** Digital Logic  
**Nature of the Course:** Theory + Lab  
**Semester:** I

**Course Code:** BIT413  
**Credit Hours:** 3  
**Total Hours:** 48

**Course Description:**

This course provides different concepts of digital logic, covering binary systems, Boolean algebra and logic gates, simplification of Boolean functions, combinational logic, sequential logic, and registers, counters, and memory unit.

**Course Objectives:**

The main objective of this course is to equip students with a solid foundation in digital logic design, enabling them to analyze, design, and implement combinational and sequential digital circuits for real-world applications.

**Learning Outcomes:**

Upon successful completion of this course, students will be able to:

- Understand basic concepts of binary systems and Boolean algebra.
- Learn to use logic gates.
- Learn to simplify Boolean functions.
- Know concepts of combinational logic.
- Know concepts of sequential logic.
- Gain knowledge of registers, counters, and memory unit.

**Course Contents:**

**Unit 1: Binary Systems (4 Hrs.)**

Digital Computers and Digital Systems; Binary Numbers; Number Base Conversions; Octal and Hexadecimal Numbers; Complements; Binary Codes; Binary Storage and Registers; Binary Logic; Integrated Circuits

**Unit 2: Boolean Algebra and Logic Gates (6 Hrs.)**

Basic Definitions; Axiomatic Definition of Boolean Algebra; Basic Theorems and Properties of Boolean Algebra; Boolean Functions; Canonical and Standard Forms; Other Logic Operations; Digital Logic Gates; IC Digital Logic Families

**Unit 3: Simplification of Boolean Functions (6 Hrs.)**

The Map Method; Two- and Three-variable Maps; Four-variable Map; Product of Sums Simplification; NAND and NOR Implementation; Don't-care Conditions

**Unit 4: Combinational Logic (10 Hrs.)**

Introduction; Design Procedure; Adders; Subtractors; Code Conversion; Analysis Procedure; Multilevel Nand Circuits; Multilevel NOR Circuits; Exclusive-OR and Equivalence Functions; Binary Parallel Adder; Decimal Adder; Magnitude Comparator; Decoders; Multiplexers; Read-Only Memory; Programmable Logic Array

**Unit 5: Sequential Logic (7 Hrs.)**

Introduction; Flip-Flops; Triggering of Flip-flops; Analysis of Clocked Sequential Circuits; State Reduction and Assignment; Flip-flop Excitation Tables; Design Procedure; Design of Counters; Design with State Equations

**Unit 6: Registers, Counters, and Memory Unit (7 Hrs.)**

Introduction; Registers; Shift Registers; Ripple Counters; Synchronous-counters; Timing Sequences; The Memory Unit

**Unit 7: Processor Logic Design (8 Hrs.)**

Introduction; Processor Organization; Arithmetic Logic Unit; Design of Arithmetic Circuit; Design of Logic Circuit; Design of Arithmetic Logic Unit; Status Register; Design of Shifter; Processor Unit; Design of Accumulator

**Laboratory Works:**

Laboratory work involves practical experiments with logic gates, adders, subtractors, multiplexers, demultiplexes, encoders, decoders, flop-flops, registers, and counters.

**Text Books:**

Mano, M. M. (2016). *Digital Logic and Computer Design*. Pearson.

**Reference Books:**

Stephen, B., & Vranesic, Z. (2009). *Fundamentals of Digital Logic with VHDL Design*. McGraw Hill.

Rafiqzaman, M. (2005). *Fundamentals of Digital Logic and Microcomputer Design*. 5<sup>th</sup> Edition. John Wiley & Sons, Inc.

**Course Title:** Mathematics  
**Nature of the Course:** Theory  
**Semester:** I

**Course Code:** BIT414  
**Credit Hours:** 3  
**Total Hours:** 48

**Course Description:**

This course provides basic concepts of calculus including limits, continuity, differentiation and integration of algebraic and transcendental functions, and their applications.

**Course Objectives:**

The main objective of this course is to provide students with a comprehensive understanding of different concepts of mathematics including limits and continuity, differentiation, integration, partial derivatives, and their applications.

**Learning Outcomes:**

Upon successful completion of this course, students will be able to:

- acquire elementary knowledge of calculus and analytical geometry.
- solve limit, continuity, differentiation and integration problems.
- apply the techniques of calculus to solve real life problems.

**Course Contents:**

**Unit 1: Limits and Continuity (5 Hrs.)**

Limit of a Function, Calculating Limits Using the Limit Laws, The Precise Definition of a Limit, Continuity, Limits at Infinity, Asymptotes: Horizontal, Vertical and Oblique.

**Unit 2: Differentiation (8 Hrs.)**

Derivatives and Rates of Change, Differentiation Rules: Algebraic Functions, Trigonometric Functions, Exponential Functions, Logarithmic Functions, Inverse Trigonometric Functions, and Hyperbolic Functions, Linear approximations and differentials.

**Unit 3: Application of Differentiation (9 Hrs.)**

Maximum and Minimum Values: Absolute and Local, Mean Value Theorem: Rolle's and Mean Value Theorem, Indeterminate Forms and L'Hospital's Rule, Curve Sketching, Optimization Problems, Newton's Method.

**Unit 4: Integrals (10 Hrs.)**

Antiderivatives, Definite Integral, Fundamental Theorems of Calculus, Indefinite Integrals and Net Change Theorem, Substitution Method, Techniques of Integration: Integration by parts, Trigonometric Substitution, Integration of Rational Functions by Partial Fractions, Approximate Integration, Improper integrals.

**Unit 5: Applications of Integration (8 Hrs.)**

Areas Between Curves, Volumes, Volumes by Cylindrical Shells, Average Value of a Function, Arc Length, Area of a Surface of Revolution.

**Unit 6: Partial Derivatives (8 Hrs.)**

Functions of Several Variables, Limits and Continuity, Partial Derivatives, Tangent Planes and Linear Approximations, Chain Rule, Directional Derivatives and Gradient Vector, Maximum and Minimum Values, Lagrange Multipliers.

**Text Books:**

Stewart, J., Clegg, D. & Watson S. (2024). *Calculus Early Transcendental* (9<sup>th</sup> ed.). Cengage.

Thomas, G. B. & Finney R. L. (2022). *Calculus and Analytic Geometry* (9<sup>th</sup> ed.). Pearson.

**Reference Books:**

Adams, R. A. & Essex, C. (2010). *Calculus: a complete course*. Pearson.

Weir, M. D. & Thomas, J. H. (2009). Thomas' *Calculus: Early Transcendentals* (12th ed.). Addison  
Wesley.

**Course Title:** Economics  
**Nature of the Course:** Theory  
**Semester:** I

**Course Code:** BIT415  
**Credit Hours:** 3  
**Total Hours:** 48

**Course Description:**

This course introduces students to fundamental economic concepts with a strong focus on their application in the Information Technology (IT) sector. It incorporates numerical problem-solving, data analysis, and real-world case studies to enhance students' analytical skills. Topics include demand and supply in digital markets, pricing strategies, cost analysis, market structures, national income, and the impact of macroeconomic policies on the IT industry.

**Course Objectives:**

The main objective of this course is to provide students with a foundational understanding of economic principles, concepts, and systems.

**Learning Outcomes:**

Upon successful completion of this course, students will be able to:

- Apply economic principles to IT business models, pricing strategies, and market trends.
- Solve numerical problems related to demand, supply, elasticity, cost, and revenue in IT firms.
- Analyze government policies and economic indicators affecting the digital economy.
- Use economic models to evaluate competition, digital market structures, and industry regulations.
- Perform simple data-driven economic analysis on IT sector trends.

**Course Contents:**

**Unit 1: Introduction to Economics and Digital Economy (4 Hrs.)**

Economic problems: Scarcity, choice, and opportunity cost; Microeconomics vs. macroeconomics in IT; Role of IT in economic growth and productivity; Numerical Application: Calculating opportunity cost and production possibility frontier

**Unit 2: Demand, Supply, and Price Mechanism in IT Markets (10 Hrs.)**

Concept of Demand, determinant of demand, law of demand; Price, income, and cross-elasticity of demand in IT services; Concept of Supply, determinants of supply and law of supply. Concepts of Elasticity of supply, Market equilibrium and digital market shifts; Pricing strategies: Freemium, subscription, dynamic pricing; Government interventions: Taxes, price ceilings, and digital subsidies. Consumer and producer surpluses; Numerical Problems: Elasticity calculations, equilibrium price and quantity, tax impact on pricing

**Unit 3: Consumer Behavior and Digital Market Decision-Making (7 Hrs.)**

Utility concepts and consumer choices in digital markets; Cardinal vs. ordinal utility; Indifference curve analysis for IT services; Behavioral economics in online purchases and digital consumption; Numerical Problems: Utility maximization and budget constraints

**Unit 4: Production, Costs, and Revenue in the IT Sector (5 Hrs.)**

Production function and scalability of IT businesses; Cost analysis in software development, cloud computing, and startups; Revenue models: Advertising, licensing, and pay-per-use models; Numerical Problems: Short-run and long-run cost analysis, break-even analysis

**Unit 5: Market Structures and Competition in IT (7 Hrs.)**

Perfect competition, monopolistic competition, monopoly, and oligopoly in digital markets; Case studies on big tech firms (Google, Apple, Microsoft, Amazon); Anti-trust policies and digital market regulations; Numerical Problems: Profit maximization under different market structures.

**Unit 6: National Income and Macroeconomic Indicators (5 Hrs.)**

GDP, GNP, and national income accounting; Economic growth, inflation, and unemployment in the IT sector; Numerical Problems: GDP calculations, inflation rate, and unemployment rate computation.

**Unit 7: Macroeconomic Policies and the IT Industry (10 Hours)**

Monetary and fiscal policy tools impacting the digital economy; Government policies on data privacy, taxation, and digital regulations; Case Study Analysis: The impact of tax regulations on tech companies

**Activities:**

- **Data Analysis:** IT industry trend analysis using economic indicators.
- **Case Studies:** Real-world application of pricing models in IT firms.
- **Policy Review:** Analysis of taxation and regulation impact on the digital economy.
- **Numerical Problem Solving:** Economic decision-making in IT business models.

**Text Books:**

Mankiw, N. G. (2020). *Principles of Economics* (9th ed.). Cengage Learning.

Varian, H. R. (2014). *Intermediate Microeconomics: A Modern Approach* (9th ed.). W.W. Norton & Company.

Shapiro, C., & Varian, H. R. (1999). *Information Rules: A Strategic Guide to the Network Economy*. Harvard Business Review Press.

**Reference Books:**

Krugman, P., & Wells, R. (2018). *Microeconomics* (5th ed.). Worth Publishers.

Pindyck, R. S., & Rubinfeld, D. L. (2017). *Microeconomics* (9th ed.). Pearson.

Goldfarb, A., Greenstein, S., & Tucker, C. (2015). *Economic Analysis of the Digital Economy*. University of Chicago Press.

Brynjolfsson, E., & McAfee, A. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. W.W. Norton & Company.

# SEMESTER-WISE DETAILED SYLLABUS

## Semester II

**Course Title:** Object-oriented Programming

**Course Code:** BIT151

**Nature of the Course:** Theory + Lab

**Credit Hours:** 3

**Semester:** II

### Course Description:

This course covers the basic concepts of object-oriented programming using Java programming. Before diving into object-oriented programming concepts like classes, objects, encapsulation, inheritance, and polymorphism, students will gain an extensive knowledge of Java's structure. Students will learn how to create modular, reusable code using Java's object-oriented programming features through practical demonstrations.

### Course Objectives:

Upon successful completion of this course, students will be able to:

- Recognize the fundamentals of Java, including its syntax, data types, and control structures.
- Apply object-oriented programming (OOP) principles, including encapsulation, inheritance, and polymorphism, in Java.
- Examine the differences between abstract classes and interfaces, along with their suitable applications.
- Implement exception handling and file input/output activities for creating strong Java programs.
- Create and implement modular Java applications utilizing object-oriented programming principles to enhance reusability and maintainability.

### Course Contents:

#### Unit 1: Introduction to Java (10 hrs.)

Overview of Java: History, Features, and Applications, Setting up the Java Development Environment (JDK, IDEs), Basic Syntax: Variables, Data Types, Operators: Arithmetic, relational, logical, and bitwise operators, Control Statements: If-else, switch-case, loops (for, while, do-while), Input and Output: Using Scanner and System.out for basic I/O operations.

#### Unit 2: Classes, Objects, and Encapsulation (12 hrs.)

Introduction to OOP Concepts (Class, Object, Encapsulation, Inheritance, Polymorphism, abstraction), Defining Classes and Creating Objects, Constructors: default and parameterized, Access Modifiers: public, private, protected, Encapsulation: Hiding Data Using Private Fields and Public Methods Getters and Setters, The this keyword.

#### Unit 3: Inheritance and Polymorphism (10 hrs.)

Inheritance: Extending Classes Using extends Keyword, Types of Inheritance: Single, Multilevel, and Hierarchical, Super Keyword and Constructor Chaining, Method Overriding vs. Method Overloading  
Polymorphism: Compile-Time and Runtime Polymorphism, Abstract classes and methods

#### Unit 4: Interfaces and Abstract Classes (8 Hrs.)

Abstract Classes: Partial Implementation Using the abstract Keyword, Interfaces: Defining Contracts Using the interface Keyword, Differences Between Abstract Classes and Interfaces, Default and Static Methods in Interfaces

#### Unit 5: Exception Handling and File I/O (8 Hrs.)

Understanding Exceptions: Checked vs. Unchecked Exceptions, Try-Catch-Finally Blocks  
Custom Exceptions, File Input/Output: Reading and Writing Files, Working with Streams: Byte Streams and Character Streams

**Laboratory Works:**

Laboratory work should be done covering all the topics listed above; it must include:

- Class and Object
- Class with encapsulation and methods and validation
- Implement a class with constructors.
- Using inheritance and abstract classes.
- Demonstrate polymorphism
- Handle exceptions and read/write to I/O.

**Text Books:**

Somashekara, M. T., Guru, D. S., & Manjunatha, K. S. (2017). Object oriented programming with JAVA (Eastern economy edition). PHI Learning Private Limited. ISBN: 9788120352872

Java: A Beginner's Guide (2022), 9<sup>th</sup> Ed., Herbert Schildt, MC Graw Hill

**Reference Books:**

Core java Volume I – Fundamentals, Ninth Edition, Cary S. Horstmann and Gary Cornell

Core java Volume II – Advanced Features, Ninth Edition, Cary S. Horstmann and Gary Cornell

Java: The Complete Reference, Ninth Edition, Herbert Schildt

Deitel, P. J., & Deitel, H. M. (2013). *Java: How to program*. PHI Learning Private Limited.

**Web Links:**

<https://www.codecademy.com/>

<https://www.freecodecamp.org/>

<https://www.hackerrank.com/>

<https://leetcode.com/>

<https://codegym.cc/>

**Course Title:** Computer Architecture  
**Nature of the Course:** Theory + Lab  
**Semester:** II

**Course No:** BIT  
**Credit Hrs:** 3

**Course Description:** This course introduces the concepts of computer architecture. It covers the concepts of register transfer, microoperations, elements of computer organization, microprogrammed control, components of CPU, pipelining, computer arithmetic, input output and memory organization.

**Course Objectives:**

Upon successful completion of this course, students will be able to:

- Understand the basic concepts computer architecture
- Understand and evaluate the CPU designs
- Interpret the concept of pipelining in computer architecture
- Comprehend computer arithmetic
- Understand how I/O and memory organization works
- Able to write programs for simulating the computer architecture concepts using some languages like VHDL

**Course Contents:**

**Unit 1: Register Transfer and Microoperations (6 Hrs.)**

Register Transfer Language; Register Transfer; Bus and Memory Transfer: Bus System, Three State Bus Buffer; Memory Transfer; Binary Adder, Binary Adder-Subtractor, Binary Incrementer, Arithmetic Circuit; Logic Microoperations; Shift Microoperations; Arithmetic Logic Shift Unit

**Unit 2: Concepts of Computer Organization (8 Hrs.)**

Instruction Codes; Computer Registers; Computer Instructions; Timing and Control; Instruction Cycle; Memory Reference Instructions; Input-Output Configurations; Input-Output Instructions; Program Interrupts; Design of Basic Computer; Design of Accumulator Logic

**Unit 3: Microprogrammed Control (5 Hrs.)**

Control Memory; Microinstruction and Microprogram; Microprogrammed Control Organization; Address Sequencing; Conditional Branching; Conditional Branch; Mapping of Instruction; Subroutines, Microinstruction Format, Symbolic Microinstructions; Symbolic Microprogram; Design of Control Unit

**Unit 4: Central Processing Unit (6 Hrs.)**

Major Components of CPU; General Register Organization; Stack Organization; Instruction Formats; Addressing Modes; Data Transfer and Manipulation; Program Control; Types of Interrupt, RISC and CISC

**Unit 5: Pipelining (6 Hrs.)**

Parallel Processing; Pipelining; Arithmetic Pipeline; Instruction Pipeline; RISC Pipeline; Vector Processing; Array Processors

**Unit 6: Computer Arithmetic (5 Hrs.)**

Addition and Subtraction; Multiplication Algorithms; Division Algorithms

**Unit 7: Input Output Organization (4 Hrs.)**

Input-Output Interface; Asynchronous Data Transfer; Modes of Transfer: Priority Interrupt; Direct Memory Access

**Unit 8: Memory Organization (5 Hrs.)**

Memory Hierarchy; Main Memory; Auxiliary Memory; Associative Memory; Cache Memory; Virtual Memory; Memory Management Hardware

**Laboratory Works:**

The laboratory work includes writing programs in C and VHDL for implementing the concepts mentioned in above chapters.

**Text Books:**

M. Morris Mano, “Computer System Architecture”, Prentice Hall of India, Pvt. Ltd., 3<sup>rd</sup> Edition, 2007  
William Stallings, Computer Organization and Architecture, Pearson, 11<sup>th</sup> Edition, 2021

**Course Title:** Discrete Structure  
**Nature of the Course:** Theory + Lab  
**Semester:** II

**Course Code:**  
**Credit Hours:** 3  
**Total Hours:** 48

**Course Description:**

This course provides different concepts of discrete structures, covering logic and proofs, number theory, induction and recursion, counting and advanced counting techniques, graphs, and trees.

**Course Objectives:**

Upon successful completion of this course, students will be able to:

1. Know different concepts of logic and proof methods.
2. Understand number theory and applications.
3. Apply induction, recursion, and counting techniques.
4. Understand graphs and their applications.
5. Know different concepts of trees and their applications.

**Course Contents:**

**Unit 1: Logic and Proofs (6 Hrs.)**

Propositional Logic; Applications of Propositional Logic; Propositional Equivalences; Predicates and Quantifiers; Nested Quantifiers; Rules of Inference; Proof Methods and Strategies

**Unit 2: Number Theory (6 Hrs.)**

Divisibility and Modular Arithmetic; Integer Representations and Algorithms; Primes and Greatest Common Divisors; Solving Congruences

**Unit 3: Induction and Recursion (4 Hrs.)**

Mathematical Induction; Strong Induction and Well Ordering; Recursive Definitions and Structural Induction; Recursive Algorithms; Program Correctness

**Unit 4: Counting and Advanced Counting (10 Hrs.)**

Basics of Counting; Pigeonhole Principle; Permutations and Combinations; Binomial Coefficients and Identities; Generalized Permutations and Combinations; Generating Permutations and Combinations; Applications of Recurrence Relations; Solving Linear Recurrence Relations; Divide-and-Conquer Algorithms and Recurrence Relations; Inclusion-Exclusion

**Unit 5: Relations (6 Hrs.)**

Relations; Properties of Relations; n-ary Relations; Representing Relations; Closures of Relations; Equivalence Relations; Partial Orderings

**Unit 6: Graphs (10 Hrs.)**

Graph and Graph Models; Graph Terminology and Special Types of Graphs; Representing Graphs and Graph Isomorphism; Connectivity; Euler and Hamilton Paths and Circuits; Shortest-Path Problem; Planar Graphs; Graph Coloring

**Unit 7: Trees (6 Hrs.)**

Trees; Applications of Trees; Tree Traversals; Spanning Trees; Minimum Spanning Trees

**Laboratory Works:**

Students should implement all the concepts and algorithms studied in each unit of the course using any suitable programming language.

**Text Books:**

Rosen, K. H. (2019). *Discrete Mathematics and Its Applications* (8<sup>th</sup> ed.). McGraw-Hill Education.

Kolman, B., Busby R., & Ross S. C. (2015). *Discrete Mathematical Structures* (6<sup>th</sup> ed.). Pearson Publications.

**Reference Books:**

Mott, J. L., Kandel, A. & Baker T. P. (2008). *Discrete Mathematics for Computer Scientists and Mathematicians* (2<sup>nd</sup> ed.). Printice Hall of India.

Bogart, K., Drysdale, S. & Stein, C. (2010). *Discrete Mathematics for Computer Scientists* (1<sup>st</sup> ed.). Addison-Wesley.

**Course Title:** Statistics  
**Nature of the Course:** Theory + Lab  
**Semester:** II

**Course Code:** BIT424  
**Credit Hours:** 3  
**Total Hours:** 48

**Course Description:**

This course offers a comprehensive introduction to important statistical concepts, including variable types, data management, data summarization, probability and some probability distributions, as well as correlation and regression analysis. In addition to the conceptual understanding, students will gain practical experience in statistical analysis and interpretation using statistical software.

**Course Objectives:**

Upon successful completion of this course, students will be able to:

1. understand the concepts of statistics and statistical science, and its applications
2. perform different descriptive statistical analysis, apply and interpret them appropriately
3. understand, compute and interpret probabilities, mathematical expectations in different conditions
4. enhance knowledge about probability distribution functions, some selected probability distributions, and apply them in real life situations
5. gain idea about sampling techniques, sampling distributions, point and interval estimations and their applications in statistical analysis
6. carry out correlation and regressions analysis
7. handle statistical software for performing preliminary statistical analysis

**Course Contents:**

**Unit 1: Introduction (6 Hrs.)**

Definition of statistics, need and importance of statistics, statistics as statistical science; application of statistics in Artificial Intelligence (AI), machine learning, information technology; scales of measurement, variable and its type, data types, sources of data, editing, coding and transcribing data, data visualization; frequency distribution, graphical presentation of frequency distribution; Steam and leaf display; cross-tabulation

**Unit 2: Data summarization (7 Hrs)**

Measures of central tendency: methods of measuring central tendency, choice of appropriate method of measuring central tendency; measures of dispersion: methods of measuring variability, absolute and relative statistical measures, choice of appropriate measure of variability; five number summary; box-plot; measures of skewness; measures of kurtosis; moments up to 4<sup>th</sup> moments and their use for measuring different summary measures

Numerical examples related to IT

**Unit3: Probability (6 Hrs)**

Concepts and definition of probability, laws of probability, conditional probability, marginal probability, joint probability, computations of probability in cross tabulated data, prior and posterior probabilities, Bayes theorem

Numerical examples related to IT

**Unit 4: Mathematical expectation and probability distributions (5Hrs)**

Concept of a random variable and its type; probability distribution of a random variable; mathematical expectation of a random variable: addition and multiplicative theorems of expectation (without proof) and their applications

Numerical examples related to IT

**Unit 5: Probability distributions (10 Hrs)**

Probability distribution function; Binomial distribution: assumptions, probability mass function, graphical presentation, major characteristics, applications; Poisson distribution: assumptions, probability mass function, graphical presentation, major characteristics, applications; Normal distribution: need and importance, probability density function, normal curve, standardized normal distribution, characteristic features, applications; exponential distribution: probability density function, graphical presentation, major characteristics, memoryless property, applications  
Numerical examples related to IT

**Unit 6: Sampling and Sampling Distribution (5 Hrs.)**

Concept of population and sampling, statistic, parameter, sample survey vs. census survey; sampling error and non-sampling error; types of sampling; standard error of mean; standard error of proportion; sampling distribution of mean and proportion; need of inferential statistics; concept of estimation and its properties(without proof); confidence interval estimation for mean and proportion, problem specific interpretation of confidence interval  
Numerical examples related to IT

**Unit 7: Correlation and Regression Analysis (9 Hrs.)**

Concept of relationship between two or more variables, linear and non-linear relationship between two variables, bivariate frequency distribution; correlation between two variables: Scatter plot, Karl Pearson's coefficient of correlation, assumptions of Pearson's correlation; Spearman's rank correlation; regression analysis: fit of linear regression model using ordinary least square(OLS) method, interpretation of regression coefficients, prediction in regression, concept of regression diagnostics, coefficient of determination and its interpretation  
Numerical examples related to IT

**Laboratory Works:****Practical (Computational Statistics):**

Laboratory works include different practical sessions which are to be exclusively performed in the Computerized Statistics Laboratory. The coverage of the practical problems are described in the following table.

**Practical problems**

<b>S. No.</b>	<b>Coverage of the units for Computational Statistics</b> (Using any statistical software such as Microsoft Excel, SPSS, STATA etc. whichever is convenient).	<b>No. of practical problems</b>
1	Data management(data editing, coding and transcribing), data visualization, stem and leaf display, frequency curves, problem specific interpretations	1
2	Measures of central tendency and their applications	1
3	Measures of variability and their applications, problem specific interpretations	1
4	Measures of skewness and kurtosis using method of moments, measures of Skewness using Box and whisker plot, problem specific interpretations	2
5	Scatter diagram, correlation coefficient and their interpretations, checking linearity assumptions, problem specific interpretations	2
6	Fitting of simple linear regression model, computations of $R^2$ , visual assessment of residuals, problem specific interpretations	1
7	Joint, marginal, conditional probability and Bayes theorem	2
8	Problems related to Binomial, Poisson and Normal, and exponential probability distributions and their applications	3

9	Problems related sampling, and sampling distribution of mean and proportion, confidence interval estimation for mean and proportion and their interpretations	3
	<b>Total number of practical problems</b>	<b>16</b>

**Text Books:**

Michael Baron (2013). *Probability and Statistics for Computer Scientists. 2<sup>nd</sup> Ed.*, CRC Press, Taylor & Francis Group, A Chapman & Hall Book.

Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, & Keying Ye(2012). *Probability & Statistics for Engineers & Scientists. 9<sup>th</sup> Ed.*, Printice Hall.

**Reference Books:**

Chatfield, Chris. *Statistics for technology (2018). A course in applied statistics.* Routledge.

Douglas C. Montgomery & George C. Ranger (2003). *Applied Statistics and Probability for Engineers. 3<sup>rd</sup> Ed.* John Willey and Sons, Inc.

Richard A. Johnson (2001). *Probability and Statistics for Engineers. 6<sup>th</sup> Ed.* Pearson Education, India

**Course Title:** Foundations of Communication Skills for IT Professionals **Course Code:** BIT425  
**Nature of the Course:** Theory + Lab **Credit Hours:** 3  
**Semester:** II **Total Hours:** 48

**Course Description:**

This course equips undergraduate IT students with essential communication skills for technical and professional success, grounded in *Fast-Tracking Your Career: Soft Skills for Engineering and IT Professionals* by Wushow Chou (2013). It covers verbal, non-verbal, written, and digital communication, emphasizing clarity, teamwork, and adaptability in IT contexts. Students will learn to articulate technical ideas, collaborate effectively, produce professional documentation, and use industry-standard communication tools, aligning with the book's focus on interpersonal skills, leadership, and career-building strategies for IT professionals.

**Course Objectives:**

Upon successful completion of this course, students will be able to:

1. Apply communication principles to excel in IT professional environments.
2. Produce clear, professional written and oral communications for diverse audiences.
3. Leverage digital tools for effective IT collaboration and project management.
4. Demonstrate interpersonal and leadership skills to enhance teamwork and resolve communication challenges.

**Course Contents:**

**Unit 1: Introduction to Communication (4 Hrs.)**

- Importance of soft skills in IT careers (*Ch. 1: Importance of Soft Skills*)
- Communication process: sender, message, channel, receiver, feedback
- Types of communication: verbal, non-verbal, written, digital
- Overcoming barriers to communication in technical settings

**Unit 2: Verbal and Non-Verbal Communication (6 Hrs.)**

- Clarity and precision in verbal communication (*Ch. 2: Verbal Communication*)
- Non-verbal cues: body language, tone, and eye contact (*Ch. 3: Nonverbal Communication*)
- Presenting technical information to diverse stakeholders
- Active listening for collaboration in IT teams

**Unit 3: Written Communication for IT (8 Hrs.)**

- Crafting professional emails, reports, and documentation (*Ch. 5: Written Communication*)
- Writing user manuals and help files for IT systems
- Adapting style for technical and non-technical audiences
- Avoiding pitfalls in technical writing

**Unit 4: Digital and Computer-Mediated Communication (8 Hrs.)**

- Using tools like Slack, Microsoft Teams, and email effectively (*Ch. 6: Computer-Mediated Communication*)
- Best practices for virtual meetings and video conferencing
- Building a professional online presence for IT careers
- Ethical considerations in digital communication

### **Unit 5: Interpersonal and Team Communication (6 Hrs.)**

- Building trust and rapport in teams (*Ch. 7: Interpersonal Skill*)
- Conflict resolution and negotiation (*Ch. 8: Negotiation and Conflict Resolution*)
- Cultural competence in global IT settings (*Ch. 9: Intercultural Skill*)
- Collaborative problem-solving in group projects

### **Unit 6: Professional Presentations and Public Speaking (8 Hrs.)**

- Structuring presentations for IT projects (*Ch. 4: Presentation Skill*)
- Using visual aids and tools like PowerPoint or Canva
- Engaging technical and non-technical audiences
- Managing presentation anxiety for confident delivery

### **Unit 7: Communication in IT Contexts (8 Hrs.)**

- Communicating with clients and stakeholders (*Ch. 10: Communication with Nontechnical People*)
- Simplifying technical jargon for accessibility
- Agile communication practices (e.g., stand-ups, sprint reviews)
- Case studies on communication in IT project management (*Ch. 11: Career Building with Soft Skills*)

### **Laboratory Works:**

Practical exercises include:

- Drafting emails, reports, and user documentation
- Using collaboration tools (e.g., Microsoft Teams, Jira) for team projects
- Delivering mock presentations with peer feedback
- Role-playing client interactions and team meetings
- Practicing virtual communication via video conferencing
- Analyzing IT communication case studies

### **Text Book:**

Chou, W. (2013). *Fast-Tracking Your Career: Soft Skills for Engineering and IT Professionals*. Wiley-IEEE Press.

### **Reference Books:**

Smith, J. (2019). *Communication Skills*. NSCC Edition, Pressbooks.

Mishra, B., & Sharma, P. (2009). *Communication Skills for Engineers and Scientists*. ResearchGate Publications.

Bovee, C. L., & Thill, J. V. (2020). *Business Communication Today* (15th ed.). Pearson Education.