



SYLLABUS FOR COMPUTER SCIENCE SEC

(Skill Enhancement Course)

Under Single Major Single Minor (FYUGP)
(To be implemented from Session 2024-25)

SEMESTER: I, II & III

Proposed Syllabus for Computer Science SEC (Skill Enhancement Course)							
Year	Semester	Paper Code	Paper	Credits	Periods/Week	Exam. Marks	Total Marks
1 st Year	I	POOASEC105 / POOASEC106	Basic Programming in Python / MS Power Point	2	2	40	60
		POOASEC105L / POOASEC106L	Basic Programming in Python (Lab) / MS Power Point (Lab)	1	1	20	
	II	POOBSEC218 / POOBSEC219	Cyber Security / HTML Programming	2	2	40	60
		POOBSEC218L / POOBSEC219L	Cyber Security (Lab) / HTML Programming (Lab)	1	1	20	
2 nd Year	III	POOCSEC332 / POOCSEC333	Fundamentals of Computer Networking / MS Excel	2	2	40	60
		POO CSEC332L / POO CSEC333L	Fundamentals of Computer Networking (Lab) / MS Excel (Lab)	1	1	20	

Semester - I

Course- SEC Paper:	Paper Code-POOASEC105 Basic Programming in Python	Credits-2	Lectures/Week-2
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Prerequisite(s) and/or Note(s):

1. High school mathematics.
2. Note(s): Syllabus changes yearly and may be modified during the term itself, depending on the circumstances. However, students will be evaluated only on the basis of topics covered in the course.

Course Objectives

Knowledge Acquired:

1. Fundamental Concepts: Students acquire knowledge of fundamental programming concepts such as variables, data types, loops, conditionals, and functions in Python.
2. Data Structures: They learn about essential data structures like lists, tuples, dictionaries, and sets, understanding their usage and implementation.

Skills Gained:

1. Coding Proficiency: Through hands-on practice and assignments, students develop coding proficiency in Python, enabling them to write clear, concise, and functional code.
2. Problem-Solving: They enhance their problem-solving skills by applying Python programming concepts to solve various computational problems and algorithms.
3. Debugging and Troubleshooting: Students acquire skills in debugging code and troubleshooting errors, learning how to identify and fix common programming mistakes effectively.

Competency Developed:

1. Logical Thinking: Python programming exercises require logical thinking and algorithmic problem-solving skills, helping students develop a logical mindset.
2. Attention to Detail: Writing code necessitates attention to detail to ensure accuracy and functionality. Students develop this competency through debugging and code review processes.
3. Collaboration and Documentation: Students learn to collaborate on coding projects using version control systems like Git and to document their code effectively, enhancing their ability to work in teams and communicate technical concepts clearly.

Syllabus Overview

Unit 1: Introduction to Python	10 Lectures
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Structure of a Python Program, Elements of Python, Entering Expressions into the Interactive Shell, The Integer, Floating-Point, and String Data Types, String Concatenation and Replication, Storing Values in Variables

Unit 2: Flow control and Functions	10 Lectures
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Boolean Values, Comparison Operators, Boolean Operators, Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution, Flow Control Statements, Importing Modules, Ending a Program Early with `sys.exit()`, `def` Statements with Parameters, Return Values and return Statements, The None Value, Keyword Arguments and `print()`, Local and Global Scope, The global Statement, Exception Handling.

Unit 3: List, Dictionary, String and Tuples**10 Lectures**

String, String functions, Manipulating Strings, Lists: Creating Lists; Operations on Lists; Built-in Functions on Lists; Implementation of Stacks and Queues using Lists; Nested Lists. Dictionaries: Creating Dictionaries; Operations on Dictionaries; Built-in Functions on Dictionaries; Dictionary Methods; Populating and Traversing Dictionaries. Tuples and Sets: Creating Tuples; Operations on Tuples; Built-in Functions on Tuples; Tuple Methods; Creating Sets; Operations on Sets; Built-in Functions on Sets; Set Methods.

Suggested Readings

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. Python Tutorial/Documentation www.python.org 2015
3. Allen Downey, Jeffrey Elkner, Chris Meyers, How to think like a computer scientist : learning with Python, Freely available online. 2012
4. <http://docs.python.org/3/tutorial/index.html>
5. <http://interactivepython.org/courselib/static/pythonds>
6. <http://www.ibiblio.org/g2swap/byteofpython/read/>

Course-SEC	Paper Code-POOASEC105L	Credits-1	Lab hours/Week-2
Paper:	Basic Programming in Python (Lab)		

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon users' choice.
2. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria:
 - a. Grade A: Percentage ≥ 80
 - b. Grade B: Percentage ≥ 70 and < 80
 - c. Grade C: Percentage ≥ 60 and < 70
 - d. Grade D: Percentage ≥ 40 and < 60
 - e. Grade E: Percentage < 40
3. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. WAP to display the first n terms of Fibonacci series.
5. WAP to find factorial of the given number.
6. WAP to implement the use of arrays in Python.
7. WAP to implement String Manipulation in python in Python.
8. WAP to find sum of the following series for n terms: $1 - 2/2! + 3/3! - \dots - n/n!$

Course- SEC Paper:	Paper Code- POOASEC105 MS Power Point	Credits-2	Lectures/Week-2
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Prerequisite(s) and/or Note(s):

1. High school mathematics.
2. Note(s): Syllabus changes yearly and may be modified during the term itself, depending on the circumstances. However, students will be evaluated only on the basis of topics covered in the course.

Course Objectives

Knowledge Acquired:

1. Presentation design principles understanding.
2. MS PowerPoint interface familiarity.
3. Slide layout and formatting comprehension.

Skills Gained:

1. Slide creation and editing proficiency.
2. Visual content insertion capability.
3. Animation and transition application skill.

Competency Developed:

1. Effective presentation delivery competency.
2. Audience engagement techniques mastery.
3. Time management during presentations efficiency.

Syllabus Overview

Unit 1: Creating and Managing Presentations	15 Lectures
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Create a Presentation: Insert and Format Slides, Modify Slides, Handouts, and Notes, Change Presentation Options and Views, Configure a Presentation for Print, Configure and Present a Slide Show, Insert and Format Text: Insert and Format Shapes and Text Boxes, Insert and Format Images, Order and Group Objects.

Unit 2: Tables, Charts, SmartArt, and Media	7 Lectures
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Insert and Format Tables: Insert and Format Charts, Insert and Format SmartArt graphics, Insert and Manage Media.

Unit 3: Transitions and Animations	8 Lectures
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Apply Slide Transitions, Animate Slide Content, Set Timing for Transitions and Animations, Working with bullets and numbering, Working with different views, Working with slide Master, Slide show option

Suggested Readings

1. Microsoft power point 2019 ,learning the basics by Eric Stockson
2. Microsoft power point 2019 for beginners by J.Davidson.
3. Marquee series Microsoft power point 2019 by Audrey Roggenkamp & Lan Rutkowsky ,Nita Rutkosky

Course-SEC	Paper Code- POOASEC105L	Credits-1	Lab hours/Week-2
Paper:	MS Power Point (Lab)		

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Creating a Title Slide
2. Creating Slides Using Layouts
3. Create a presentation that consists of 5 slides and save your Presentation in desktop.
4. Demonstrate slide transitions and animation
5. Insert slide number, slide date, slide header and footer
6. Demonstrate rehearse time.
7. Demonstrate master slide.

Semester - II

Course- SEC Paper:	Paper Code-POOBSEC218 Cyber Security	Credits-2	Lectures/Week-2
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Prerequisite(s) and/or Note(s):

1. Anyone interested in learning about the subject.
2. Note(s): Syllabus changes yearly and may be modified during the term itself, depending on the circumstances. However, students will be evaluated only on the basis of topics covered in the course.

Course Objectives

Knowledge Acquired:

1. Cyber threats landscape understanding.
2. Principles of cryptography comprehension.
3. Network security protocols familiarity.

Skills Gained:

1. Ethical hacking techniques application.
2. Security assessment tools utilization.
3. Incident response plan development.

Competency Developed:

1. Risk assessment proficiency.
2. Security policy formulation expertise.
3. Communication of security concepts clarity

Syllabus Overview

Unit 1: Introduction of Cyber Security	5 Lectures
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A Brief History of the Internet, Computer Crime, Defining Cyber Security and Cyberspace, Communication and web technology, Internet, World wide web, regulation of cyberspace, concept of cyber security, Issues and challenges of cyber security. Cyber security terminologies: Security, Attacks, risk, vulnerability, exploit, hacker, Computer Criminals, Cyber warfare, Security Services, Security Mechanisms, Case Studies.

Unit 2: Cyber crimes	6 Lectures
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Cyber crimes targeting Computer systems and Mobiles - spyware, logic bombs, DoS, virus, Trojans, ransomware, data breach, Online scams and frauds - email scams, Phishing, Online job fraud, Online sextortion, Debit/ credit card fraud, Online payment fraud, website defacement, Cyber espionage, Darknet - illegal trades, drug trafficking, human trafficking, Social Media Scams & Frauds-impersonation, identity theft, misinformation, fake news, cyber crime against persons - cyber grooming, child pornography, cyber stalking, Cyber bullying, Social Engineering attacks, Crime reporting procedure, Case studies.

Unit 3: Digital Devices Security, Tools & Technologies for Cyber Security	12 Lectures
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End Point device and Mobile phone security, Password policy, Security management, Data backup, Downloading and management of third party software, Device security policy, Cyber Security best practices, Significance of host firewall and Ant-virus, Wi-Fi security, Configuration of basic security policy and permissions.

Unit 4: Cyber law and Investigation	7 Lectures
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Cyber crime and legal landscape around the world, IT Act, 2000 and its amendments. Limitations of IT Act, 2000. Cyber crime and punishments, Cyber Laws and Legal and ethical aspects related to new technologies- AI/ML, IoT, Blockchain, Darknet and Social media, Cyber Laws of other countries, Case Studies.

Suggested Readings

1. "Cybersecurity for Dummies" by Chey Cobb.
2. "Computer Hacking Beginners Guide" by Alan T. Norman
3. "Hacking: Computer Hacking, Security Testing, Penetration Testing, and Basic Security" by John Slavo.
4. Bharat Bhaskar, Electronic Commerce: Framework, Technology and Application, 4thEd., McGraw Hill Education
5. Security in Computing, 3rd Edition, Charles P. Pfleeger & Shari Lawrence Pfleeger, PHI
6. Cryptography and Network Security, A. Kahate, TMH

Course-SEC Paper:	Paper Code- POOBSEC218L Cyber Security (Lab)	Credits-1	Lab hours /Week-1
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Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. What are the Roles and Responsibilities of System Administrator? Demonstrate the steps for creating the User account, setting permissions, and protecting your files with password.
2. What is Wifi? How do you configure the Wifi on Windows operating system
3. Write the steps for creating the User account, setting permissions and protecting your files with password.
4. Write the steps for installation of software from Open source Mode and Paid subscription mode.
5. Write the steps to establish peer to peer network connection using two systems in a LAN.
6. Write the steps in providing network security and to set Firewall Security in windows.
7. Prepare a Case study on Ransomware attacks.
8. Prepare a case study on Social Media Crime.
9. Write the steps to prevent the denial of Service attacks.
10. What is Malware? Write the steps to remove the malware from your PC.
11. List out the various Mobile security apps. Write the steps to install and use, one of the mobile security app.
12. Write the steps to analyze the E-Mail Application's security vulnerabilities.
13. Write the steps to read Email Headers and identify them as SPAM.
14. Write the steps to check whether the website is legitimate or not.

Course- SEC Paper:	Paper Code-POOBSEC219 HTML Programming	Credits-2	Lectures/Week-2
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Prerequisite(s) and/or Note(s):

1. Anyone interested in learning about the subject.
 - a. Experience with any text editor like notepad,
 - b. How to create directories and files on your computer.
 - c. How to navigate through different directories.
 - d. How to type content in a file and save them on a computer.
 - e. Understanding about images in different formats like JPEG, PNG format.
2. Note(s): Syllabus changes yearly and may be modified during the term itself, depending on the circumstances. However, students will be evaluated only on the basis of topics covered in the course.

Course Objectives

Knowledge Acquired:

1. Understanding of web page structure.
2. Notepad, browser familiarity.
3. Knowledge about building web pages.

Skills Gained:

1. Proficiency in web page development.
2. Visual content insertion capability.
3. Creation of forms, tables.

Competency Developed:

1. Effective web page development competency.
2. Understanding the core concepts of web development and how web pages are constructed.
3. Ability to structure and organize content on a web page effectively.
4. Skills in creating forms to collect and manage user input.

Syllabus Overview

Unit 1: HTML Overview	5 Lectures
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Introduction to web page designing using HTML: create and save an HTML document, access a web page using a web browser, Basic HTML document, HTML document structure.

Unit 2: HTML basic tags	5 Lectures
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Heading tag, Paragraph tag, Line break tag, Centering content, Horizontal lines, Preserve formatting, HTML tags: html, head, title, body, (attributes: text, background, bgcolor, link, vlink, alink), br (break), hr (horizontal rule), inserting comments, h1..h6 (heading), p (paragraph), b (bold), i (italics), u (underline), ul (unordered list), ol (ordered list), and li (list item). Description lists: dl, dt and dd. Attributes of ol (start, type), ul (type).

Unit 3: HTML Formatting	5 Lectures
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Bold Text, Italic Text, Underlined Text, Strike Text, Monospaced Font, Superscript Text, Subscript Text, Inserted Text, Deleted Text, Larger Text, Smaller Text, Grouping Content

Unit 4: HTML – Images, Tables, Forms**15 Lectures**

Insert images: img (attributes: src, width, height, alt), sup (super script), sub(subscript). HTML Forms: Textbox, radio buttons, checkbox, password, list, combo box. Embed audio and video in a HTML page. Create a table using the tags: table, tr, th, td, rowspan, colspan

Suggested Readings

1. HTML 5.0 for Beginners, Vinod Kumar Murugesan
2. Learn HTML in Easy way, Ritesh Kumar.
3. A Complete Reference, HTML and CSS, Thomas A. Powell

Course-SEC	Paper Code- POOBSEC219L	Credits-1	Lab hours/Week-2
Paper:	HTML Programming (Lab)		

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Creating an HTML document for displaying a web page with the following tags:
 - a. Bold
 - b. Italic
 - c. Alignment
 - d. Paragraph
 - e. Underline
 - f. Text colour
 - g. Background colour
 - h. Heading
 - i. Line break
 - j. pre
2. HTML program to create nested lists
3. HTML program to create a form to take input from user and display it
4. HTML program demonstrating use of tables.
5. Design a web page of your CV with headings as objective, educational qualification, achievement, strength, hobbies and personal details.
Apply the following specifications:
 - a. Set any light colour as page background
 - b. Bold and underline all headings
 - c. Insert your image on the left side of the web page
 - d. Use heading tag to specify the heading
 - e. After every heading is over put a horizontal line
 - f. Use pre tag for educational qualification.

Semester - III

Course- SEC	Paper Code-POOCSEC332	Credits-2	Lectures/Week-2
Paper:	Fundamentals of Computer Networking		

Prerequisite(s) and/or Note(s):

1. Basic Computer Literacy: Students should be familiar with fundamental computer operations such as using the keyboard, mouse, files, folders, and basic software applications.
2. No Prior Networking Knowledge Required: This is an introductory course, designed for beginners.
3. Recommended for: Undergraduate students from Computer Science, IT, Electronics, or any discipline with interest in Information Technology.

Course Objectives:

1. To introduce students to the basic concepts and purpose of computer networks.
2. To explain the different types of networks, devices, transmission media, and communication protocols.
3. To provide a foundational understanding of network architectures such as the OSI and TCP/IP models.
4. To familiarize students with basic IP addressing, configuration of small networks, and networking tools.
5. To develop practical skills for designing, setting up, and troubleshooting basic wired and wireless networks.

Knowledge Acquired:

By the end of this course, students will have gained theoretical and practical understanding of:

1. The role and components of computer networks in modern communication.
2. Types of networks (LAN, WAN, MAN), topologies, and data transmission media.
3. Hardware components like routers, switches, hubs, access points, NICs, and their uses.
4. Networking protocols such as TCP/IP, HTTP, FTP, SMTP, DNS, and DHCP.
5. Network security fundamentals including firewall basics, encryption, and safe internet practices.

Skills Gained:

1. Identify and differentiate between types of networks, hardware, and topologies.
2. Setup, configure, and troubleshoot a basic wired or wireless network.
3. Use basic networking tools and commands like ping, ipconfig, tracert, and netstat.
4. Share resources like printers and files over a local network, Configure Wi-Fi routers and manage basic internet sharing settings.
5. Implement safe browsing and basic network security practices.

Competency Developed:

1. Understanding the foundational structure and operation of computer networks.
2. Performing hands-on tasks involved in configuring small network environments.
3. Communicating effectively using networking terminology and concepts.
4. Applying practical problem-solving techniques in network setup and troubleshooting.
5. Enhancing employability for roles such as IT support technician, helpdesk executive, or junior network administrator.

Syllabus Overview

Unit 1: Introduction to Computer Networks 12 Lectures

Definition and objectives of computer networks; Advantages and applications of networking; Types of networks: LAN, MAN, WAN, PAN; Network topologies: Bus, Ring, Star, Mesh, Hybrid; Modes of transmission: Simplex, Half Duplex, Full Duplex; Categories of networks: Peer-to-Peer vs. Client-Server; Basic network architecture: OSI Model (overview) and TCP/IP model (layers and functions)

Unit 2: Networking Hardware and Transmission Media 6 Lectures

Networking devices: NIC (Network Interface Card), Switch, Hub, Router, Bridge, Gateway, Repeater, Access Point; Transmission media - Guided: Twisted Pair, Coaxial Cable, Fiber Optic, Unguided -Wi-Fi, Bluetooth, Infrared, Satellite, Concept of signal types: Analog and Digital signals; IP addressing: IPv4 and IPv6 (Basics only)

Unit 3: Network Protocols and Configuration 5 Lectures

Concept of protocol and protocol stacks; Important networking protocols: TCP/IP, HTTP/HTTPS, FTP, SMTP, POP3, DNS and DHCP; IP Addressing schemes, subnetting (basic concepts); Understanding firewalls and antivirus for network protection.

Unit 4: Network Setup, Troubleshooting, and Security Basics 7 Lectures

Steps to create a small network (wired/wireless LAN setup); Configuring a Wi-Fi router and sharing Internet connection; File and printer sharing over LAN; Common network troubleshooting tools and commands: ping, ipconfig, tracert, nslookup, netstat; Introduction to cybersecurity basics in networking Safe browsing practices, securing Wi-Fi, network encryption (WPA/WPA2); Introduction to Virtual Private Networks (VPN)

Suggested Readings

1. Data Communications and Networking, Author: Behrouz A. Forouzan, Publisher: McGraw-Hill Education.
2. Computer Networks, Author: Andrew S. Tanenbaum & David J. Wetherall, Publisher: Pearson Education
3. Computer Networking: A Top-Down Approach, Author: James F. Kurose & Keith W. Ross Publisher: Pearson
4. Networking All-in-One For Dummies (8th Edition), Author: Doug Lowe, Publisher: Wiley
5. Introduction to Networking, Author: Bruce Hallberg, Publisher: McGraw-Hill

Supplementary Materials and Online Resources:

1. Cisco Networking Essentials – Craig Berg Hands-on book with basic configuration and troubleshooting for beginners.
2. CompTIA Network+ Guide to Networks – Jill West, Tamara Dean, Jean Andrews Good for learners aiming at industry certification and real-world examples.
3. Cisco Networking Academy – <https://www.netacad.com> Free structured courses by Cisco for beginner to intermediate networking students.
4. GCF LearnFree – Computer Networking – <https://edu.gcfglobal.org/en/computers> Interactive tutorials and beginner-level explanations of networking concepts.
5. Microsoft Learn – Networking Fundamentals – <https://learn.microsoft.com>

Course-SEC	Paper Code-POOCSEC332L	Credits-1	Lab hours/Week-2
Paper:	Fundamentals of Computer Networking (Lab)		

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Create a diagram illustrating LAN, MAN, and WAN with examples.
2. Identify and compare various network topologies: Star, Ring, Bus, Mesh.
3. Simulate peer-to-peer and client-server communication using two computers.
4. Categorize different types of networks based on geographic coverage and purpose.
5. Label and explain the seven layers of the OSI model using a real-world analogy.
6. Create a table comparing OSI vs TCP/IP model with examples for each layer.
7. Identify different networking devices (hub, switch, router, NIC, modem) and state their purpose.
8. Connect two computers using Ethernet crossover cable and test connectivity.
9. Demonstrate the use of a Wi-Fi dongle and access point to connect a PC wirelessly.
10. Create a visual layout of different network cables (coaxial, twisted pair, fibre optic) and describe their use.
11. Test signal strength in various areas using a Wi-Fi analyser tool.
12. Create a presentation showing the differences between analog and digital transmission signals.
13. Use ping to test the connectivity between two devices on a network.
14. Demonstrate tracert or traceroute to trace the route to a public domain (e.g., www.google.com).
15. Demonstrate the use of nslookup command to find IP addresses of domains.
16. Demonstrate the use of email protocols (SMTP/POP/IMAP) using a mail client.
17. Set up a small wired LAN for file sharing between 3 computers.
18. Install and configure a Wi-Fi router with password.
19. Enable and disable Windows firewall and observe its effect on ICMP (ping) traffic.
20. Use netstat to observe active connections on a system and interpret the results.

Course- SEC	Paper Code- POOCSEC333	Credits-2	Lectures/Week-2
Paper:	MS Excel		

Prerequisite(s) and/or Note(s):

1. Basic knowledge of using a computer and operating systems (Windows/macOS)
2. Familiarity with basic mathematical operations
3. No prior experience with MS Excel is required Course Objectives:
 1. To provide comprehensive knowledge of Microsoft Excel from basic to advanced features
 2. To enable students to efficiently manage, analyze, and visualize data
 3. To develop problem-solving skills using formulas, functions, and tools in Excel
 4. To prepare students for professional and academic tasks involving spreadsheet usage

Knowledge Acquired:

1. Understanding of the Excel interface and navigation
2. Concepts of workbook, worksheets, cell references, ranges, and data types
3. Knowledge of formatting, sorting, filtering, and conditional formatting
4. Deep understanding of formulas and functions (logical, statistical, lookup, text, date/time)
5. Knowledge of data visualization tools such as charts and graphs.

Skills Gained:

1. Creating, formatting, and managing worksheets and workbooks
2. Applying and combining functions for calculations and data analysis
3. Using charts and graphs to represent data visually and effectively
4. Collaborating and protecting workbooks with shared access and security features
5. Importing/exporting data from other sources

Competency Developed:

1. Ability to use MS Excel efficiently in academic, personal, and professional contexts
2. Proficiency in data management and decision-making based on spreadsheet analysis
3. Enhanced productivity through automation and advanced Excel tools
4. Readiness for administrative, business analytics, accounting, data entry, and reporting roles
5. Foundation for certification exams like Microsoft Office Specialist (MOS) – Excel

Syllabus Overview

Unit 1:	Introduction to MS Excel	12 Lectures
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Overview of spreadsheet software and applications; Getting started with Excel: interface, ribbons, toolbars, and menus; Creating, saving, and opening workbooks; Understanding cells, rows, columns, ranges ; Data entry: text, numbers, dates; Basic formatting: font, alignment, number formats, borders, and colours, Introduction to worksheet management (insert, delete, rename, move)

Unit 2:	Working with Formulas and Functions	8 Lectures
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Cell referencing: relative, absolute, and mixed references; Basic arithmetic formulas and operators; Common Mathematical functions: SUM, AVERAGE, PERCENTAGE, MIN, MAX, and COUNT; Logical: IF, AND, OR; Text: CONCATENATE, LEFT, RIGHT, LEN, TRIM; Date/Time: TODAY, NOW, DAY, MONTH, YEAR

Unit 3:	Data Management and Presentation	5 Lectures
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Sorting and Filtering data; Conditional Formatting, Data validation and drop-down lists, Charts and Graphs: Column, Bar, Line, Pie charts; Formatting chart elements; Printing worksheets and setting page layouts

Unit 4:	Practical Applications and Productivity Tools	5 Lectures
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Using Templates in Excel; Working with Multiple Sheets; Introduction to Tables and basic data analysis; Freeze Panes, Split View, and Zoom features; Basic PivotTable creation and interpretation; Protecting worksheets and workbooks; Exporting data (PDF, CSV)

Suggested Readings

1. Microsoft Excel 2021 Step by Step , *Author:* Curtis Frye, *Publisher:* Microsoft Press
2. Excel 2021 Bible, *Author:* Michael Alexander, Richard Kusleika, *Publisher:* Wiley
3. Excel Basics In 30 Minutes (2nd Edition), *Author:* Ian Lamont, *Publisher:* i30 Media Corporation
4. Microsoft Excel Data Analysis and Business Modeling, *Author:* Wayne L. Winston
Publisher: Microsoft Press
5. Excel All-in-One For Dummies, *Author:* Greg Harvey, *Publisher:* Wiley

Course-SEC	Paper Code- POOCSEC333L	Credits-1	Lab hours/Week-2
Paper:	MS Excel (Lab)		

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Create a new workbook and save it with the name Student_Info.xlsx.
2. Enter the details of 10 students: Name, Roll No, Class, and Marks in 3 subjects.
3. Format the worksheet by applying borders, font styles, and background color.
4. Rename the worksheet as "Student Data" and insert a header and footer.
5. Adjust column widths and row heights to fit the data properly.
6. Use the Wrap Text and Merge & Center options for a title row.
7. Copy data from one sheet to another and move a worksheet within the workbook.
8. Insert a new row and column in your data and input additional student information.
9. Calculate the Total Marks and Average Marks of each student using formulas.
10. Apply the IF function to assign grades (e.g., IF(Average $\geq$ 60, "Pass", "Fail")).
11. Use the MAX, MIN, and COUNT functions on marks.
12. Use the ROUND, ROUNDDUP, and ROUNDDOWN functions on average marks.
13. Use TEXT functions like LEFT, RIGHT, MID, and CONCATENATE on student names.
14. Insert the current date using the TODAY() function and show how many days have passed since a given date using DATEDIF().
15. Apply Sorting to arrange the students in ascending order of total marks.
16. Apply Conditional Formatting to highlight marks below 40 in red.
17. Create a Pie Chart showing percentage-wise marks of a single student.
18. Freeze the top row and the first column to make headings visible while scrolling.
19. Prepare a print-friendly version of your worksheet using Page Layout settings.
20. Create a new sheet and apply a Template for a monthly expense tracker.
21. Create a PivotTable to summarize total marks by class.
22. Protect a worksheet with a password and try editing locked cells.
23. Use the Goal Seek tool to find out the marks required in one subject to achieve a total of 250.
24. Split the worksheet window and use Zoom to focus on a section of data.
25. Export the student data to PDF and CSV formats.