SYLLABUS FOR COMPUTER SCIENCE SEC

(Skill Enhancement Course)

Under Single Major Single Minor (FYUGP)

(To be implemented from Session 2024-25)

SEM. I & II

Year	Semester	Paper Code	Paper	Credits	Periods/Week	Exam. Marks	Total Marks
1st 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	
2nd Year	II	POOBSEC218 / POOBSEC219	Cyber Security / HTML Programming	3	3	40	60
		POOBSEC218L / POOBSEC219L	Cyber Security (Lab) / HTML Programming (Lab)	1	1	20	

Proposed Syllabus for Computer Science SEC (Skill Enhancement Course)

Course- SEC Paper:	Paper Code-POOASEC105	Credits-2	Lectures/Week-2
	Basic Programming in Python		

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

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

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

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: $1 – 2/2! + 3/3! - - - - - n/n!$

Course- SEC Paper:	Paper Code- POOASEC105 MS Power Point	Credits-2	Lectures/Week-2

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

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

Insert and Format Tables: Insert and Format Charts, Insert and Format SmartArt graphics, Insert and Manage Media.

Unit 3: Transitions and Animations	8 Lectures

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

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.

Course- SEC Paper:	Paper Code-POOBSEC218 Cyber Security	Credits-2	Lectures/Week-2

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

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

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

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

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 Slavio.
4. Bharat Bhaskar, Electronic Commerce: Framework, Technology and Application, 4thEd., McGraw Hill Education
5. Security in Computing,3rd Edition,Charles P. Pfleeger & Shari Lawrence Pfeleeger,PHI
6. Cryptography and Network Security,A.Kahate,TMH

Course-SEC Paper:	Paper Code- POOBSEC218L Cyber Security (Lab)	Credits-1	Tut. hours/Week-1

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.
15. Write the steps to prevent the denial of Service attacks
16. Demonstrate the use of Network tools: ping, ipconfig, ifconfig, tracert, arp, netstat, whois
17. Demonstrate sending of a protected word document.

| Course- SEC | Paper Code-POOBSEC219 | Credits-2 | Lectures/Week-2 |
| Paper: | HTML Programming | | |

Prerequisite(s) and/or Note(s):
(1) Anyone interested in learning about the subject.

1. Experience with any text editor like notepad,
2. How to create directories and files on your computer.
3. How to navigate through different directories.
4. How to type content in a file and save them on a computer.
5. 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

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

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

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 KumarMurugesan
2. Learn HTML in Easy way, Ritesh Kumar.
3. A Complete Reference, HTML and CSS, Thomas A. Powell

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

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) 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.
(3) HTML program to create nested lists
(4) HTML program to create a form to take input from user and display it
(5) HTML program demonstrating use of tables.