SAMRAT VIKRAMADITYA VISHWAVIDYALAYA, UJJAIN MP

(Session -2025-2026 onwards)

B.Sc. (Hon's) Computer Science FOUR YEARS (EIGHT SEMESTERS), CBCS SCHEME (NEP)

S.No.	Paper code	Course Component and Name of Course	Credits			Marks		Total
			T	P	Total	Max Marks CCE Internals	Max Marks Theory Externals	
1.	BSCH 601 Major-1	Programming in Phython	4	0	4	30	45	100
	BSCH P	Programming in Phython	0	1	1	10	15	
2.	BSCH 602 Major-2	Cyber Security	5	0	5	40	60	100
3.	BSCH 603 Major-3	Cloud Computing	4	0	4	40	60	100
4.	BSCH-604 Ability Enhancement	Major Project	6	0	6	80	120	200
Total Credits and marks			19	1	20	200	300	500

PART A: Introduction				
Program: Degree		Class: VI Sem	Year: III Year	Session: 2025-26
Subject: Computer Science				
1.	Course Code	**BSCH – 601**		
2.	Course Title	**PROGRAMMING IN PYTHON**		
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	**Major-1**		
4.	Pre-Requisite (if any)	Basic knowledge of programming		
5.	Course Learning Outcomes(CLO)	• Students will be able to design web applications using python • Students will be able to create GUI application • Students will be able to plot graphs • Students will be able to image processing • Student will able to access. • Student will able to learn working with database.		
6.	Credit Value	4 Credits		
7.	Total Marks	Max.Marks : 75(45+30)	Min. Passing Marks: 28	

PART B: Content of the Course		
Total No. of Lectures(in hours per week): 1 Hour per Day		
Total Lectures:60 Hours		
Unit	Topics	No. of Lectures
I	**Python Introduction:** History, Features, Python vs other languages, Python Installation path setup and running programme, Python IDE: Anaconda, Pycharm, Spider, Jupyter notebook, Google Colab. Python Syntax, comment, variable, literals, datatype, type casting, operators, Control Statements- If-else, Match-case, while loop, for loop, break, continue and pass statement.	12
II	**Python Function and Module:** Defining and calling function, Arguments- arbitrary arguments, keyword argument, Default arguments, return value, Pass by reference vs value, Recursion, Variable scope. **Modules-** Module creation, using import, from..import and, from..as statement, Math module, DateTime module.	12
III	**Python OOPs Concept-** Class & Object, Constructor, Inheritance and Polymorphism. String and string manipulation, **Python Collection-** List, tuple, set, dictionaries and Arrays. Python error and Exception Handling, File Handling, Read and Write CSV and Excel file, Python Multithreading.	12
IV	**Python Djengo / Flask**- Overview of HTML, CSS, JavaScript, installation of Djengo/Flask, create website with python code, Run website using Djengo/Flask Framework. **Python with MySQL / SQLite-** Installation, Creating database, connection and table, Data manipulation with Insert, Select, Update and Delete command.	12
V	**Python Miscellaneous:** Command line arguments, CGI programming, GUI programming using Tkinter, Image Processing using OpenCV, Plotting graph using Matplotlib, Overview of NumPy, Pandas, SciPy, Keras, Tensorflow and Pillow.	12

PART C: Learning Resources

Textbooks, Reference Books, Other Resources
Suggested Readings: 1. Let Us Python, Yashavant Kanetkar and Aditya Kanetkar, BPB publication 2. Zero To Mastery In Python Programming, Monu Singh Rakesh K. Yadav, Srinivas Arukonda, Vayu Education Of India publication. 3. Python All-in-One for Dummies, John Shovic, Alan Simpson, Wiley publication
https://nptel.ac.in/courses/106106145 https://www.javatpoint.com/python-tutorial https://www.tutorialspoint.com/python/index.htm https://www.w3schools.com/python/

Part D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks: **75** Continuous Comprehensive Evaluation (CCE): **30** Marks University Exam (UE): **45** Marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test Assignment/Presentation	15 15 **Total Marks: 30**
External Assessment: University Exam (UE) Time: 03.00 Hours	Section (A): Five Short Questions Section (B): Five Long Questions	03 × 05 = 15 06 × 05= 30 **Total Marks: 45**

PART A: Introduction				
Program: Degree		Class: VI Sem	Year: III Year	Session: 2025-26
Subject: Computer Science				
1.	Course Code	**BSCHP – 601**		
2.	Course Title	**PROGRAMMING IN PYTHON**		
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	**Major-1**		
4.	Pre-Requisite (if any)	Basic knowledge of programming		
5.	Course Learning Outcomes(CLO)	• Students will be able to design web applications using python • Students will be able to create GUI application • Students will be able to plot graphs • Students will be able to image processing • Student will able to access. • Student will able to learn working with database.		
6.	Credit Value	1		
7.	Total Marks	Max.Marks : 25(10+15)	Min. Passing Marks: 10	

PART B: Content of the Course		
No. of Lab Practicals (in hours per week): **2 hours per week**		
Total No. of Lab.: **60 Hrs.**		
	Suggestive list of Practicals	**No. of Labs.**
	Given the problem statement, students are required to write code in Python, execute and test it. Students should be given assignments on following: 1. Python program to add two numbers 2. Python Program to print maximum of two numbers 3. Python Program for factorial of a number 4. Python Program to check Armstrong Number 5. Python program to check whether a number is Prime or not 6. Python Program to print given n-th Fibonacci number 7. Python Program to print ASCII Value of a character 8. Python program to reverse words in a given String 9. Python Program to find sum of array 10. Python program to find sum of elements in list 11. Python program to find the sum of all items in a dictionary	60

	12. Python program to Find the size of a Tuple 13. Python program to get Current Date and Time 14. Python program to write and read text file 15. Python program to read csv and excel file 16. Python Program for exception handling 17. Python Program for creating and running web pages using Djengo or flask 18. Python Program for insert, select, update and delete operation on MySQL / SQLite. 19. Python program for image processing 20. Python Program to plot graphs.	

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings:

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2. Zero To Mastery In Python Programming, Monu Singh Rakesh K. Yadav, Srinivas Arukonda, Vayu Education Of India publication.
3. Python All-in-One for Dummies, John Shovic, Alan Simpson, Wiley publication

https://nptel.ac.in/courses/106106145
https://www.javatpoint.com/python-tutorial
https://www.tutorialspoint.com/python/index.htm
https://www.w3schools.com/python/

PART D: Assessment and Evaluation

Internal Assessment : Continuous Comprehensive Evaluation (CCE) : **10Marks**		**External Assessment**: University Exam (UE) : **15 Marks** Time : **02.00 Hours**	
Internal Assessment	**Marks**	**External Assessment**	**Marks**
Hands-on Lab Practice	2 Marks	Practical record file	5 Marks
Viva	3 Marks	Viva voce practical	5 Marks
Lab Test from practical list	2 Marks	Table works/ Exercise Assigned (02) in practical exam	2 Marks
Assignments (Charts/ Model)/ Technology Dissemination/ Excursion/ Lab visit/ Industrial Training	3 Marks	Reports of excursion/ Lab visits/ Industrial training/ Survey/ Collection/ Models	3 Marks
Total ***Excursion/ Lab visits/ Industrial Training is compulsory***	**10 Marks**	**Total**	**15 Marks**

PART A: Introduction				
Program: BCA		Class: VI SEM	Year: III Year	Session: 2025-26
Subject: Computer Science				
1.	Course Code	BSCH 602		
2.	Course Title	**Cyber Security**		
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	Major II		
4.	Pre-Requisite (if any)			
5.	Course Learning Outcomes(CLO)	**After the successful completion of the course, the student shall be able to-**: ➢ To grasp the fundamental principles, concepts, and terminology of cyber security, including various types of cyber threats, attacks, and vulnerabilities. ➢ To be able to design, implement, and manage network security measures, including firewalls, intrusion detection systems, and secure wireless networks.. ➢ To understand the principles of cryptography and be able to apply cryptographic techniques to secure communication channels, such as encrypting data and verifying digital signatures. ➢ To understand the legal and ethical aspects of cyber security, including privacy laws, intellectual property rights, and ethical hacking practices. ➢ To develop a continuous learning mindset, keeping up-to-date with emerging trends, new threats, and evolving technologies in the field of cyber security.		
6.	Expected job role /career opportunities	➢ Security Analyst ➢ Ethical Hacker/Penetration Tester ➢ Security Consultant ➢ Digital Forensics Analyst		
7.	Credit Value	5		
8.	Total Marks	Max. Marks : 100	Min. Passing Marks: 35	

PART B: Content of the Course		
Total No. of Lectures(6 hours per week): 01 Hours per day		
Total Lectures: 60 Hours		
Unit	Topics	No. of Lectures
I	Introduction to Cyber Security, Need for security, Concept of Cyber Space, CyberCrimes and Cyber-attack.Fundamental security principles – threats, attacks andvulnerability.Key Security triad – Confidentiality, Integrity and Availability.Introduction to different classes of security attacks - active and passive.Impact ofattacks on an organization and individuals. Principles of Cybersecurity– Applycybersecurity architecture principles. Cybersecurity models	12
	History, what is Information Security? Critical Characteristics of Information, NSTISSCSecurity Model, Components of an Information	12

II	System, Securing the Components,Balancing Security and Access, The Security SDLC, The Computer Security Problem - Targets and Attacks.Approaches to Computer Security, Basic Security Terminology - Security Models.Legal, Ethical and Professional Issues.	
III	Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk.Risk Identification, Techniques for Identifying risks, Risk Analysis: Types of Risk Analysis, Probability and impact assessment, Risk Matrix, Prioritizing Risks.Risk Evaluation: Accepting, Transferring, Mitigating or Avoiding Risks, Risk Treatment, Monitoring and Review.	12
IV	Introduction Cyber Threat, Definition of Cyber Crime, Classification – Current Threats and Trends, Diversity of Cyber Crime, Cyber Hate Crimes, Cyber Terrorism. Cyber Strategy– National Security Strategy – Cyber Security Strategy – Organized Crime Strategy –Cyber Crime Strategy, Policy Cyber Crime, International Response – National Cyber Security Structure, Strategic Policy Requirements.	12
V	Preventing Cyber Crime, Password Protection, Get Safe Online, Cyber Security, Guidance for Business, Cyber Crime Investigation Skills, Criminal Investigation, Code of Ethics, Hi-Tech Investigations, Capturing and Analyzing Digital Evidence, Cyber security testing – Penetration testing. System Level Solutions –Introduction to Intrusion Detection System (IDS) and Intrusion Protection System (IPS). Basic Concept of Ethical, Hacking. Protecting against Cyber Crime	12

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings:

1. Textbooks:

- "Principles of Information Security" by Michael E. Whitman and Herbert J. Mattord, 6th Edition (2021), Publisher: Cengage Learning
- "Computer Security: Principles and Practice" by William Stallings and Lawrie Brown, 4th Edition (2018), Publisher: Pearson
- "Cryptography and Network Security: Principles and Practice" by William Stallings, 8th Edition (2020), Publisher: Pearson
- "Security Engineering: A Guide to Building Dependable Distributed Systems" by Ross J. Anderson, 2nd Edition (2008). Publisher: Wiley

2. Suggestive digital platforms web links:

https://owasp.org/

https://www.sans.org/

https://www.nist.gov/cybersecurity

https://thehackernews.com/

Suggested equivalent online courses: https://onlinecourses.swayam2.ac.in

Part D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks: **100** Continuous Comprehensive Evaluation (CCE): **40**Marks University Exam (UE): **60** Marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test Assignment/Presentation	20 20 **Total Marks: 40**
External Assessment: University Exam (UE) Time: 03.00 Hours	Section (A):Short Answer type questions Section (B): Long Answer Type Questions	04× 05 = 20 08× 05 = 40 **Total Marks: 60**

PART A: Introduction				
Program: Degree		Class: VI SEM	Year: III Year	Session: 2025-26
Subject: Computer Science				
1.	Course Code	**BSCH 603**		
2.	Course Title	**Cloud Computing**		
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	**Minor I**		
4.	Pre-Requisite (if any)	To study this course, a student must have the basic knowledge of internet. This course will be studied by all the students of PG level under the Core Course category.		
5.	Course Learning Outcomes(CLO)	• Basic knowledge of internet. • DBMS • Computer Networking and Communication.		
6.	Credit Value	4 Credit		
7.	Total Marks	Max. Marks : 100	Min. Passing Marks: 35	

PART B: Content of the Course		
Total No. of Lectures (in hours per week): 01 Hours per day		
Total Lectures: 60 Hours		
Unit	Topics	No. of Lectures
I	**Basics of Cloud Computing:** Definition, History of Cloud Computing, Characteristics of cloud computing, Advantages and Disadvantages, Principles of cloud computing. Cloud Computing Architecture**,** How does cloud computing works, Real world applications of Cloud computing, Cloud Storage.	12
II	**Cloud Deployment Models:** Types of Cloud- Public, Private, Hybrid, Community, Public Cloud vs Private Cloud vs Hybrid Cloud. **Cloud Service Model:** Cloud Based Services, Software as a Service (SaaS), Platform as a Service (PaaS). Infrastructure as a Service (IaaS): differences among SaaS, PaaS and IaaS.	12
III	**Cloud Virtualization:** Virtualization in Cloud Computing, characteristics, Difference between Cloud Computing and Virtualization, Pros and Cons of Virtualization in Cloud Computing, Data Virtualization.	12
IV	**Hardware Virtualization & Software Virtualization**: Server Virtualization, Operating system based Virtualization, Network Virtualization. **Cloud Service Provider:** Amazon Web Services (AWS) vs Azure vs (GCP), Security risks and Privacy challenges of Cloud Computing.	12
V	**Grid Computing:** Definition, Differences between Grid and Cloud Computing, Differences between Fog and Cloud Computing, IoT and Cloud Computing, Media streaming, advantages of streaming in cloud, Overview of Multi Cloud.	12

PART C: Learning Resources
Textbooks, Reference Books, Other Resources
Suggested Readings: 1. Tomar Saurabh, Cloud Computing, Wiley Pub. 2. Selvi : Mastermind Cloud Computing, TMH, Pub.
Suggestive digital platform web links: **https://www.simplilearn.com/tutorials/cloud-computing-tutorial** https://www.tutorialspoint.com/cloud_computing/cloud_computing_tutorial.pdf https://www.simplilearn.com/cloud-computing-basics-guide-pdf
Suggested equivalent online courses: **https://onlinecourses.nptel.ac.in/noc21_cs14/preview** **https://www.youtube.com/watch?v=2LaAJq1lB1Q** **https://www.mygreatlearning.com/cloud-computing/free-courses**

Part D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks: **100** Continuous Comprehensive Evaluation (CCE): **40** Marks University Exam (UE): **60** Marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test Assignment/Presentation	20 20 **Total Marks: 40**
External Assessment: University Exam (UE) Time: 02.00 Hours	Section (A):Short Answer type questions Section (B): Long Answer Type Questions (50 Words Each)	04 × 05 = 20 08 × 05 = 40 **Total Marks: 60**