SYLLABUS FOR

THE FOUR-YEAR UNDERGRADUATE PROGRAMME (FYUGP)

As per provision of NEP-2020 to be implemented from Academic Year 2022 onwards

Session 2025-26

Semester – VII & VIII(Honors and Honors with Research)

DEPARTMENT OF COMPUTER SCIENCE

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)

B. SC. (Multiple Major) – DEGREE COURSE (Session 2025-26)
Major – Computer Science

	SEMESTER	COURSE TYPE	Theory/ Practical	COURSE CODE	PAPER TITLE	CREDIT L	T	P	Max Marks	ESE	IA
F O U R T H Y E A R	**VII**	DSC-VIIA	Theory	UBSDCT704	Programming in Python	3	0	0	100	80	20
		DSC-VIIA	Practical	UBSDCL704	Programming in Python - LAB	0	0	1	50	40	10
		DSE-VII A	Theory	UBSDET704 A	Machine Learning	3	0	0	100	80	20
		DSE-VII A	Practical	UBSDEL704 A	Machine Learning - LAB	0	0	1	50	40	10
		DSE-VIII A	Theory	UBSDET704 B	Theory of Computation	3	1	0	100	80	20
		DSE- IX A	Theory	UBSDET704 C	Soft Computing	3	1	0	100	80	20
		GE	Theory	UBSGET704	Relational Database Management System	3	0	0	100	80	20
		GE	Practical	UBSGEL704	Relational Database Management System	0	0	1	50	40	10
	VIII (Honors Course)	DSC- VIIIA	Theory		Web Technology	3	0	0	100	80	20
		DSC-VIIIA	Practical		Web Technology - LAB	0	0	1	50	40	10
		DSE-X A	Theory		Cloud Computing	3	1	0	100	80	20
		DSE-XI A	Theory		Cyber Security & Cyber Law	3	1	0	100	80	20
		DSE-XII A	Theory		Advanced Operating System	3	1	0	100	80	20
		DSE-XII A	Theory		Principles of Compiler Design	3	1	0	100	80	20
	VIII (Honors with Research Course)	DSC- VIIIA	Theory		Web Technology	3	0	0	100	80	20
		DSC-VIIIA	Practical		Web Technology - LAB	0	0	1	50	40	10
		DSE-X A	Theory		Cloud Computing	3	1	0	100	80	20
		Research project / Dissertation	Practical		Research project / Dissertation	0	0	4	100	80	20

ESE- End Semester Exam, IA-Internal Assessment
Instruction for Question paper setting
End Semester Exam (ESE) for DSC, DSE and GE
**There will be 03 sections of question of 80 marks**
Section A- section A will be very short answer type questions consisting 8 questions of 2 marks, two questions from each unit.

Section B- section B will be short answer type questions consisting 4 questions of 6 marks each, one question from each unit with internal choice.

Section C- section B will be long answer (Descriptive) type questions consisting 4 questions of 10 marks each, one question from each unit with internal choice.

Minimum Pass Marks 40%

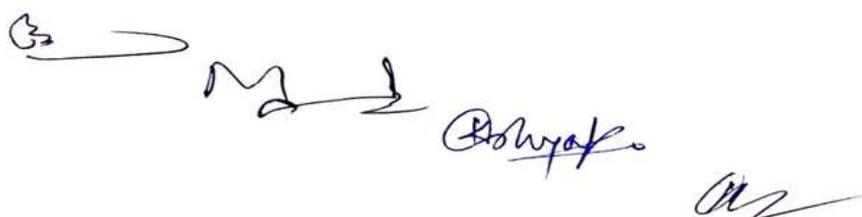| Section		Maximum Marks (80)
A	2 x 8 = 16	Very short answer type questions consisting 8 Questions of 2 marks, two question from each unit.
B	6 x 4 = 24	Short answer type questions consisting 4 questions of 6 marks each, one question from each unit with internal choice.
C	10 x 4 = 40	long answer (Descriptive) type questions consisting 4 questions of 10 marks each, one question from each unit with internal choice
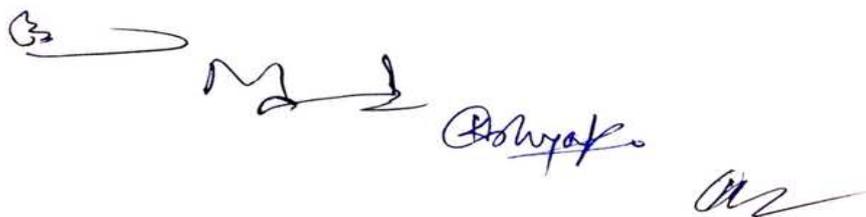
Program Objective

Po1-   It is to give foundation knowledge for the students to understand advance Computer Science including applied aspect for the same.

Po2-   It is to develop enhanced quantitative skills and pursuing higher Computer Science and research as well as.

Po3-   Students will be able to develop software as well as knowledge of research project and dissertation.

Po4–   Students will become employable in various governments, public and private sectors.

Po5-   Scientific tempers in general and computer temper in particular will the developed in students.

Po6-   Sufficient subject matter competence and enable students to prepare for various competitive examinations such as GATE, UGC-CSIR, NET/JRF , college professor and Civil Services Examinations.

Program Specific Outcome (PSO)

PSO1-   Student should be able to understand the Programming knowledge of Python Programming Language.

PSO2-   Student should be able to know the Machine learning.

PSO3-   Student under stand and knowledge of soft computing.

PSO4-   Student should be able to working in cloud computing .

PSO5-   Student should be able to website development using Web technology .

PSO6-   Student should be able to know functions and basics of Cyber security and Cyber law.

PS07-   Student under stand and knowledge of Advanced Operating System.

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)
FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VII**	Subject: **Computer Science**
Course Type: **DSC**	Course Code:
Course Title:	**Programming in Python**
Credit: **4 (3 Theory + 1 Practical)**	Lecture: **45**
M.M. 100 = **Theory (ESE 80 + IA 20)** (Theory)	Minimum Passing Marks: **40%**
M.M. 50 = 50 (Internal 10 + Practical (Practical) Record – 20 + Practical 10 + Viva 10)	Minimum Passing Marks: **40%**

Prerequisite	As per Program	
Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Define the structure and components of a Python program. • Demonstrate proficiency in handling of loops and creation of functions. Identify the methods to create and manipulate lists, tuples and dictionaries. • Discover the commonly used operations involving regular expressions and file system. • Use libraries to write python program. • Use various data structure of python. • Interpret the concepts of Object-Oriented Programming as used in Python.	

Total No. of Teaching–Learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	Topics (Course contents)	No. o Perio
I	**Introduction to Python Programming**: What is a Program, Formal and Natural Languages, Why use Python, Uses of python, Strengths & Drawbacks, The Python Interpreter, Running Python, The IDLE User Interface, The Interactive Prompt, Script Mode, Dynamic Typing , Debugging. **Types, Operators, Expressions & Statements**: Values and Types, Assignment Statement, Variable Names, Expressions & Statements, Order of Operations, String Operations, Comments.	10
II	**Conditionals**: Boolean Expressions, Logical operators, Conditional & Alternative Execution, Chained and Nested Conditions. **Iterations**: Reassignment, Updating Variables, The "for" and "while" statements, break. **Strings**: String is a sequence, len, Traversal with a for loop, String Slices, Searching, Looping and Counting, String Methods, the "in" operator, String Comparison.	10
III	**Lists, Tuples, and Dictionaries;** Basic list Operators, replacing, inserting, removing an element, searching and sorting lists, Accessing tuples, Operations, Working, Functions and Methods, dictionary literals, adding and removing keys, accessing and replacing values, Traversing Dictionaries.	10
IV	**Function, Files and Graphics**: Defining a function, calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables, **Files**: Files & Persistence, Reading and Writing, Filenames and Paths. **Graphics programming**: Drawing with turtle graphics, using turtle module, moving the turtle with any direction, moving turtle to any location, the color, bgcolor, circle and speed method of turtle, drawing with colors, drawing basic shapes using iterations. **Python Libraries**: Exploring python libraries like Panda, Numpy, TensorFlow, Scikit-Learn, Keras, PyTorch, SciPy etc.	15

Text Books, Reference Books and Others

Text Books Recommended:

- T. Budd, Exploring Python, TMH, 1st Ed, 2011
- Allen Downey, Jeffrey Elkner, Chris Meyers, How to think like a computer scientist: Learning with Pyth,Freelyavailableonline.2012

Reference Books Recommended:

- Luca Massaron John Paul Mueller, Python for Data Science For Dummies, Wiley, 2ed, 2019
- Allen B. Downey, Think Python: How to Think Like a Computer Scientist, 2nd edition by O'Reilly, 2015
- Zed A. Shaw, Learn Python 3 the Hard Way (Addison-Wesley, 2016)

Online Resources:

- NPTEL URL link for Python Programming:
  https://www.youtube.com/watch?v=eoPsX7MKfc8&list=PLIdgECt554OVFKXRpo_kuI0XpUQKk0ycO
- Complete NPTEL link for Basic Python Programming:
  https://www.youtube.com/watch?v=Y3Ri2GdYfYg&list=PLqftY2uRk7oXvERQEgATSr-KzAh8WLW_D
- File Handling: https://www.w3schools.com/python/python_file_handling.asp
- NumPy: https://www.w3schools.com/python/numpy/default.asp
- Pandas: https://www.w3schools.com/python/pandas/default.asp
- SciPy: https://www.w3schools.com/python/scipy/index.php
- Django: https://www.w3schools.com/django/index.php
- Matplotlib: https://www.w3schools.com/python/matplotlib_intro.asp
- Machine Learning: https://www.w3schools.com/python/python_ml_getting_started.asp
- Python MySQL: https://www.w3schools.com/python/python_mysql_getstarted.asp
- Topics related Python from SWAYAM/NPTEL
  - https://www.youtube.com/channel/UCxu1cR5XRauYn37yg-Fh6rA
  - https://www.youtube.com/channel/UCJAgw1niUkaShdmA5aAZdQw
- Topics related Python from Tutorials
  - https://www.javatpoint.com/python-tutorial
  - http://docs.python.org/3/tutorial/index.html
  - http://interactivepython.org/courselib/static/pythonds
  - http://www.ibiblio.org/g2swap/byteofpython/read/
- Python for Beginners:
  - https://www.w3schools.com/python/python_intro.asp
  - https://www.python.org/about/gettingstarted/
  - https://www.javatpoint.com/python-tutorial
  - https://www.geeksforgeeks.org/python-programming-language/

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Department – Computer Science

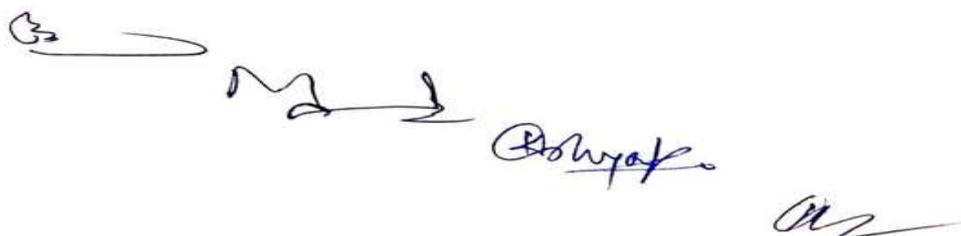|	
Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VII**	Subject: **Computer Science**
Course Type: **DSC LAB**	Course Code:
Course Title:	**LAB - Programming in Python**
Credit: 1	Lecture: **30**
M.M. 50 = 50 (Internal 10 + Practical (Practical) Record – 20 + Practical 10 + Viva 10)	Minimum Passing Marks: **40%**

Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Define the structure and components of a Python program. • Demonstrate proficiency in handling of loops and creation of functions. Identify the methods to create and manipulate lists, tuples and dictionaries. • Discover the commonly used operations involving regular expressions and file system. • Determine the need for scraping websites and working with CSV, JSON and other file formats. • Interpret the concepts of Object-Oriented Programming as used in Python.
Credit Value	1 Credits	*Credit =30 Hours Laboratory or Field Learning/Training*
Total Marks	Max. Marks: 50	Min Passing Marks: 20

Content of the Course

Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)

Module	Topics (Course contents)	No. of Period

List of Practical Experiments	**Note:** This is tentative list; the teachers concern can add more program as per requirement.
	1. Python program to find the union of two lists.
	2. Python program to find the intersection of two lists.
	3. Using for loop, print a table of Celsius/Fahrenheit equivalences. Let c be the Celsius temperatures ranging from 0 to 100, for each value of c, print the corresponding Fahrenheit temperature.
	4. Using while loop, produce a table of sins, cosines and tangents. Make a variable x in range from 0 to 10 in steps of 0.2. For each value of x, print the value of $\sin(x)$, $\cos(x)$ and $\tan(x)$.
	5. Write a program that reads an integer value and prints —leap year‖ or —not a leap year‖.
	6. Write a program that takes a positive integer n and then produces n lines of output shown as follows.
	    For example, enter a size: 5
	    *
	    **
	    ***
	    ****
	    *****
	7. Write a function that takes an integer _n‘as input and calculates the value of 1 + 1/1! + 1/2! + 1/3! + … + 1/n
		30

8. Write a function that takes an integer input and calculates the factorial of that number.
9. Write a function that takes a string input and checks if it's a palindrome or not.
10. Write a list function to convert a string into a list, as in list (_abc') gives [a, b, c].
11. Write a program to generate Fibonacci series.
12. Write a program to check whether the input number is even or odd.
13. Write a program to compare three numbers and print the largest one.
14. Write a program to print factors of a given number.
15. Write a method to calculate GCD of two numbers.
16. Write a program to create Stack Class and implement all its methods. (Use Lists).
17. Write a program to create Queue Class and implement all its methods. (Use Lists)
18. Write a program to implement linear and binary search on lists.
19. Write a program to sort a list using insertion sort and bubble sort.
20. Python program to remove the "i" th occurrence of the given word in a list where words repeat.
21. Python program to count the occurrences of each word in a given string sentence.
22. Python program to check if a substring is present in a given string.
23. Python program to map two lists into a dictionary.
24. Python program to count the frequency of words appearing in a string using a dictionary.
25. Python program to create a dictionary with key as first character and value as words starting with that character.
26. Python program to find the length of a list using recursion.
27. Python program to read a file and capitalize the first letter of every word in the file.
28. Python program to read the contents of a file in reverse order.
29. Python program to create a class in which one method accepts a string from the user and another prints it.
30. Study and Implementation of Database, Structured Query Language and database connectivity.

FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VII**	Subject: **Computer Science**
Course Type: **DSE - I**	Course Code:
Course Title:	**Machine Learning**
Credit: **4 (3 Theory + 1 Practical)**	Lecture: **45**
M.M. 100 = **Theory (ESE 80 + IA 20)** (Theory)	Minimum Passing Marks: **40%**
M.M. 50 = 50 (Internal 10 + Practical Record – 20 + Practical 10 + Viva 10) (Practical)	Minimum Passing Marks: **40%**

Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Gain a deep understanding of advanced AI and machine learning principles. • Acquire skills for conducting a thorough literature review and formulating research problems. • Learn to design and implement advanced AI and machine learning algorithms. • Can understand and design generative AI techniques. • Can apply AI and machine learning techniques to solve real-world problems.

Credit Value	3 Credits	*Credit = 15 Hours - learning & Observation*	
Total Marks	Max. Marks:	100	Min Passing Marks: 40

Content of the Course

Total No. of Teaching–Learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	Topics (Course contents)	No. of Period
I	**Introduction:** Concept of Machine Learning, Applications of Machine Learning, Key elements of Machine Learning, Supervised vs. Unsupervised Learning, Traditional programming Vs. Machine learning Statistical Learning: Bayesian Method, The Naïve Bayes Classifier.	13
II	**Linear Regression:** Prediction using Linear Regression, Gradient Descent, Linear Regression with one variable, Linear Regression with multiple variables, Polynomial Regression, Feature Selection and Feature Extraction. **Logistic Regression:** Classification using Logistic Regression, Logistic Regression vs. Linear Regression, Logistic Regression with one variable and with multiple variables.	11
III	**Regularization:** Regularization and its utility: The problem of Over fitting, Application of Regularization in Linear and Logistic Regression, Regularization and Bias/Variance. **Neural Networks:** Introduction, Model Representation, Gradient Descentvs. Perceptron Training, Stochastic Gradient Descent, Multilayer Perceptrons, Multiclass Representation, Back propagation Algorithms.	10
IV	**Deep Learning:** Introduction basics, various architectures of Deep learning: CNN, LSTM, Generative AI. **Machine learning tools:** Introduction of MATLAB, WEKA as machine learning tools, Using GUI of MATLAB and WEKA to develop Machine learning based models. Write programs to Implement machine learning models.	11

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books *Recommended:*

- Machine learning, Anuradha Srinivasaraghavan, Vincy Joseph, Wiley publication, India , 2019 edition.
- Introduction to Machine Learning with python A guide for data scientists, Andreas, C. Muller & Sarah Guido, O'Reilly.

Reference Books *Recommended:*

- Understanding machine learning: From theory to algorithms, shai shalev-shwartez, shai ben-david, Cambridge University press.
- Machine learning with python, Abhishek Vijayvargia, BPB publication.
- Machine learning using python, U Dinesh Kumar, Manaranjan Pradhan, Wiley publication.
- Deep learning, Ian Goodfellow , Yoshua Bengio, Aoran Courville, Adaptive computation and machine learning series.
- Machine learning, Tom M. Mitchell, McGraw Hill, Indian Edition.

Online Resources:

- Overview of Machine Learning:
  https://www.youtube.com/watch?v=whSKA8aO6xQ&list=PLyqSpQzTE6M-SISTunGRBRiZk7opYBf_K&index=3
- Introduction to Artificial Intelligence:
  https://www.youtube.com/watch?v=pKeVMlkFpRc&list=PLwdnzlV3ogoXaceHrrFVZCJKbm_laSHcH&index=2
- Deep Learning specialization:
  https://www.coursera.org/specializations/deep-learning
- Learning Material for Deep Learning
  https://onlinecourses.nptel.ac.in/noc24_cs114/preview
- Learning Material for Artificial Intelligence and Machine Learning
  https://onlinecourses.nptel.ac.in/noc24_ce107/preview
- Learning Material for Machine Learning
  https://onlinecourses.swayam2.ac.in/imb24_mg126/preview
- learning Material for Artificial Intelligence
  https://swayam-plus.swayam2.ac.in/course_detail?course_code=P_SMARTBRIDGE_01
- Learning Material for Machine Learning using Python
  https://www.coursera.org/specializations/machine-learning-introduction
- Learning Material for Artificial Intelligence
  https://www.coursera.org/learn/ai-for-everyone
- Learning Material for Machine Learning
  https://coursera.org/specializations/machine-learning-introduction

FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VII**	Subject: **Computer Science**
Course Type: **DSE – I LAB**	Course Code:
Course Title:	**LAB – Machine Learning**
Credit: 1	Lecture: **30**
M.M. 50 = 50 (Internal 10 + Practical (Practical) Record – 20 + Practical 10 + Viva 10)	Minimum Passing Marks: **40%**

Course Learning Outcomes (CLO)	At the end of course, Students will be able to: • Understand complexity of Machine Learning algorithms and their limitations; • Applying common Machine Learning algorithms in practice and implementing their own. • Perform experiments in Machine Learning using real-world data. • Design and implement machine learning solutions to classification, regression, and clustering problems; and be able to evaluate and interpret the results of the algorithms. • Understand modern notions in data analysis oriented computing.	
Credit Value	**1 Credits**	*Credit =30 Hours Laboratory or Field Learning/Training*
Total Marks	Max. Marks: 50	Min Passing Marks: 20

Content of the Course

Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)

Module	Topics (Course contents)	No. of Period
List of Practical Experiments	1. Use command to compute the size of a matrix, size/length of a particular row/column, load data from a text file, store matrix data to a text file, finding out variables and their features in the current scope. 2. Perform basic operations on matrices (like addition, subtraction, multiplication) and 3. Display specific rows or columns of the matrix. 4. Perform other matrix operations like converting matrix data to absolute values, taking the negative of matrix values, adding/removing rows/columns from a matrix, finding the maximum or minimum values in a matrix or in a row/column, and finding the sum of some/all elements in a matrix. 5. Create various type of plots/charts like histograms, plot based on sine/cosine function based on data from a matrix. Further label different axes in a plot and data in a plot. 6. Generate different subplots from a given plot and color plot data. 7. Use conditional statements and different type of loops based on simple example/s. 8. Perform vectorized implementation of simple matrix operation like finding the transpose of a matrix, adding, subtracting or multiplying two matrices. 9. Implement Linear Regression problem. For example, based on a dataset comprising of existing set of prices and area/size of the houses, predict the estimated price of a given house. 10. Based on multiple features/variables perform Linear Regression. For example, based on a number of additional features like number of bedrooms, servant room,	30

number of balconies, number of houses of years a house has been built – predict the price of a house.

11. Implement a classification/ logistic regression problem. For example based on different features of students data, classify, whether a student is suitable for a particular activity. Based on the available dataset, a student can also implement another classification problem like checking whether an email is spam or not.

12. Use some function for neural networks, like Stochastic Gradient Descent or back propagation - algorithm to predict the value of a variable based on the dataset of problem.

Note: List of experiments may be changed by the concerned teacher.

Text Books, Reference Books and Others

Text Books Recommended:
- Machine learning, Anuradha Srinivasaraghavan, Vincy Joseph, Wiley publication, India, 2019 edition.
- Introduction to Machine Learning with python A guide for data scientists, Andreas, C. Muller & Sarah Guido, O'Reilly.

Reference Books Recommended:
- Understanding machine learning: From theory to algorithms, shai shalev-shwartez, shai ben-david, Cambridge University press.
- Machine learning with python, Abhishek Vijayvargia, BPB publication.
- Machine learning using python, U Dinesh Kumar, Manaranjan Pradhan, Wiley publication.
- Deep learning, Ian Goodfellow , Yoshua Bengio, Aoran Courville, Adaptive computation and machine learning series.
- Machine learning, Tom M. Mitchell, McGraw Hill, Indian Edition.

Online Resources:
- Overview of Machine Learning:
  o https://www.youtube.com/watch?v=whSKA8aO6xQ&list=PLyqSpQzTE6M-SISTunGRBRiZk7opYBf_K&index=3
  o http://www.jnit.org/wp-content/uploads/2020/04/Machine-Learning-Lab-Manual.pdf
  o https://nthu-datalab.github.io/ml/
  o https://www.deeplearning.ai/courses/
  o https://www.jnec.org/labmanuals/csc/tc/scm1/Machine%20Learning%20LAB%20MANUAL%20(1).pdf
  o https://deepakdvallur.weebly.com/machine-learning-laboratory.html
  o https://copyassignment.com/machine-learning-a-gentle-introduction/
- Introduction to Artificial Intelligence:

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)
FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VII**	Subject: **Computer Science**
Course Type: **DSE - II**	Course Code:
Course Title:	**Theory of Computation**
Credit: **4 (Theory)**	Lecture: **60**
M.M. 100 = **Theory (ESE 80 + IA 20)** (Theory)	**Minimum Passing Marks: 40%**

Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Understanding of the core concepts in automata theory and formal languages. • Understanding and analyzing the fundamentals of compiler designing. • Design grammars and automata (recognizers) for different language classes. • Design the pushdown automata. • Design the Turing machine.	
Credit Value	**4 Credits**	*Credit = 15 Hours - Learning & Observation*
Total Marks	Max. Marks: 100	Min Passing Marks: 40

Content of the Course

Total No. of Teaching–Learning Periods (01 Hr. per period) – 60 Periods (60 Hours)

Unit	Topics (Course contents)	No. of Period
I	**Introduction to automata**: Definition and types of automata: Finite Automata, Pushdown Automata, Turing Machine, introduction to Grammar and languages according to the types of automata. **Finite Automata:** Introduction to Finite State Automata (FSA): Formal definition, simpler notations (state transition diagram, transition table). Types of FSA: Deterministic Finite Automata (DFA), Nondeterministic Finite Automata (NFA), Finite Automata with Epsilon Transitions, Elimination of Epsilon transitions, Conversion of NFA to DFA, Equivalence of NFA and DFA. Applications of Finite Automata, Minimization of Deterministic Finite Automata. Mealy machine, Moore machine.	15
II	**REGULAR EXPRESSIONS (RE):** Introduction to RE, Identities of Regular Expressions, Finite Automata and Regular Expressions- Converting from DFA to Regular Expressions, Converting Regular Expressions to Automata, applications of Regular Expressions. **REGULAR GRAMMARS**: Definition, regular grammars and FA, FA for regular grammar, Regular grammar for FA. Proving languages to be non-regular -Pumping lemma, applications, Closure properties of regular languages.	15
III	**CONTEXT FREE GRAMMAR (CFG):** Introduction to CFG's, Properties of CFG's, Derivation Trees, Sentential Forms, Rightmost and Leftmost derivations of Strings. Ambiguity in CFG, Minimization of CFG, Chomsky Normal Form (CNF), Greibach Normal Form (GNF), Pumping Lemma for CFLs. **PUSHDOWN AUTOMATA:** Introduction of PDA and its model, types of PDA, Languages accepted by the PDA, Acceptance by Final State and Acceptance by Empty stack and its Equivalence, Equivalence of CFG and PDA.	15
IV	**TURING MACHINES (TM):** Formal definition and model of Turing Machine, Types of TMs, Languages of a TM, TM as acceptors, Properties of recursive and recursively enumerable languages, Universal Turing machine, The Halting problem, Undecidable problems about TMs. Context sensitive language and linear bounded automata (LBA).	15

Text Books, Reference Books and Others

Text Books Recommended:

- John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman (2007), Introduction to Automata Theory Languages and Computation, 3rd edition, Pearson Education, India.
- K. L. P Mishra, N. Chandrasekaran (2003), Theory of Computer Science-Automata Languages and Computation, 2nd edition, Prentice Hall of India, India.

Reference Books Recommended:

- A.M. Padma Reddy, Finite Automata and Formal languages, Pearson Education India
- Michael Sipser, Third Edition, Introduction to the Theory of Computation, Cengage Learning.

Online Resources:

- NPTEL YouTube Channel: Lectures on Theory of Computation
  https://youtube.com/playlist?list=PLbMVogVj5nJSd25WnSU144ZyGmsqjuKr3&si=EvuSjnO_TT1oTHjn
- NPTEL YouTube Channel: Lectures on Theory of Automata, Formal Languages and Computation
  https://youtube.com/playlist?list=PL85CF9F4A047C7BF7&si=SBm-gIkmkjOBDscB
- NPTEL YouTube Channel: Lectures on Theory of Computation and Automata
  https://youtube.com/playlist?list=PL3-wYxbt4yCgBHUpwXDTLos3JStccGIax&si=TbYH91hmlOrtUEnN
- SWAYAM YouTube Channel: Introduction to Automata, Languages and Computations
  https://youtube.com/playlist?list=PLbRMhDVUMngcwWkzVTm_kFH6JW4JCtAUM&si=RbTG3WZ0Jf6Zx_pu

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)
FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VII**	Subject: **Computer Science**
Course Type: **DSE - III**	Course Code:
Course Title:	**Soft Computing**
Credit: **4 (Theory)**	Lecture: **60**
M.M. 100 = **Theory (ESE 80 + IA 20)** (Theory)	**Minimum Passing Marks: 40%**

Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Analyze and appreciate the applications which can use fuzzy logic. • Understand the difference between learning and programming and explore practical applications of Neural Networks (NN). • Understand the efficiency of a hybrid system and how Neural Network and fuzzy logic can be hybridized to form a Neuro-fuzzy network and its various applications • Understand the importance of optimizations and its use in computer engineering fields and other domains. • Introduce the ideas of fuzzy sets, fuzzy logic and use of heuristics based on human experience.

Credit Value	4 Credits	*Credit = 15 Hours - Learning & Observation*	
Total Marks	Max. Marks: 100		Min Passing Marks: 40

: **Content of the Course**

Total No. of Teaching–Learning Periods (01 Hr. per period) – 60 Periods (60 Hours)

Unit	Topics (Course contents)	No. of Period
I	**Introduction:** Soft computing, Different tools of soft computing: Fuzzy logic, Artificial Neural Network, Genetic Algorithm), Area of application. **Fuzzy Logic:** Introduction to Classical Sets and Fuzzy Sets, Membership Function, properties and operations of classical set and Fuzzy set, a-cuts, Properties of a-cuts, Linguistic Variables, Membership function, Classical relation and Fuzzy Relation and its properties and operations, Defuzzification and its methods, Fuzzy rule base.	15
II	**Artificial Neural Network(ANN):** Architecture, Introduction, Evolution of Neural Network, Biological Neural Network Vs ANN, Basic Model of ANN, Different types of ANN, Single layer Perceptron, Solving XOR problem, Activation function, Linear severability, Supervised and unsupervised learning, perceptron learning, delta learning, Feed-forward and Feedback networks, Error Back Propagation Network (EBPN), Associative memories and its types, Hopefield Network, Kohenen self-organizing Map.	15
III	**Genetic Algorithm:** What is Optimization?, Introduction, Application, GA operators: selection, crossover and mutation, different techniques of selection, crossover and mutation, different types of chromosomes, Application of GA.	15
IV	**Hybrid soft commuting:** Design of Neuro-Fuzzy model like ANFIS, Neuro-Genetic, Fuzzy-Genetic Neuro-Fuzzy-Genetic model.	15

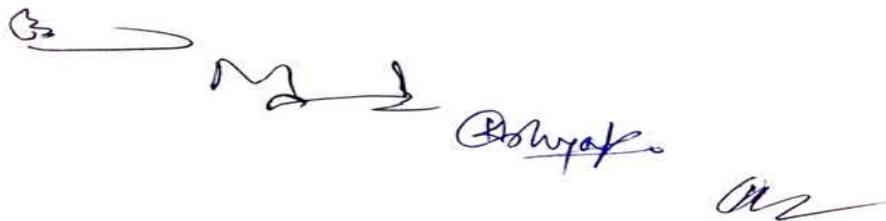| Text Books, Reference Books and Others |
| --- |

Text Books Recommended:

- Principles of soft computing, S.N. Shivanandan and S.N. Deepa , Wiley publication, Wiley India Edition.
- Neural network and Learning Machines, Simon Haykin, Pearson Education, 2011.
- Artificial Neural Networks, Robert J. Scholkoff, McGraw Hill Education (India) Pvt. Limited, 1997.
- Fuzzy Sets, Uncertainty and Information, G. J. Klir and T.A. Folger, PHI learning private limited. Publisher– Pearson 3Edition 1999

Reference Books Recommended:

- Neural Networks and Fuzzy Systems, A dynamical Systems Approach to Machine Learning, Bart Kosko, PHI learning private limited.
- Neural Networks, Fuzzy Logic and Genetic Algorithm: Synthesis and Applications, S. Rakasekaran, G.A. VijayalakshmiPai, PHI learning private limited, 14th Edition. 2003.
- Neural Networks and Fuzzy Logic, K. Vinoth Kumar, R. Saravana Kumar, S. K. Kataraia and Sons publication.
- Artificial Neural Networks, B.Yegnanarayana Prentice Halll of India (P) Limited.
- Introduction to Artificial Neural Systems, Jacek M. Zurada, Jaico Publication House.

Online Resources:

- Introduction to Soft computing: What is soft computing - Javatpoint
- Need for Soft Computing: Need for Soft Computing - GeeksforGeeks
- Introduction To Soft Computing: Introduction To Soft Computing - Course (nptel.ac.in)

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)
FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VII**	Subject: **Computer Science**
Course Type: **GE**	Course Code:
Course Title:	**Relational Database Management System**
Credit: **4 (3 Theory + 1 Practical)**	Lecture: **45**
M.M. 100 = **Theory (ESE 80 + IA 20)** (Theory)	Minimum Passing Marks: **40%**
M.M. 50 = 50 (Internal 10 + Practical (Practical) Record – 20 + Practical 10 + Viva 10)	Minimum Passing Marks: **40%**

Course Learning. Outcomes (CLO)	At the end of this course, the students will be able to: • Learn about Database Concepts, Architecture, various Users, Data Models and Data Management. • Familiar with RDBMS Software like Oracle and MySql. • Create various Tables and Databases. • Explore various SQL commands. • Create Database on the basis of E-R diagrams for Minor and Major Project.
Credit Value	**3 Credits** | *Credit = 15 Hours - Learning & Observation*
Total Marks	**Max. Marks: 100** | **Min Passing Marks: 40**

Content of the Course

Total No. of Teaching–Learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	Topics (Course contents)	No. of Period
I	**Overview of Database Management:** Introduction, Data Processing versus Data Management, Data Models: Network Model, Relational Model, Hierarchical Model, Instance and schema, View of Database system, File Oriented Approach vs Database Oriented Approach, Data Independence, DBMS Architecture, Database Administration Roles, Database languages: DDL, DML, DCL, TCL, Different kinds of DBMS users, Introduction to Data Dictionary.	12
II	**Database Design and E-R Model:** Introduction, Entity, Strong and weak entities, Relationship, Cardinality, Attributes, Concept of keys: Super key, Candidate key, Primary key, Alternate key, Foreign key, ER Diagram, Constraints in Database, Codd's Rules, Extended ER features: Generalization, Specialization and Aggregation, Participation, Converting an E-R model into relational Schema.	11
III	**Relational Database Design and Operations:** Introduction, Dependencies: Functional dependencies, Multivalued Dependencies, Join dependencies, Database anomalies, Decomposition, Normalization: Normal forms 1NF, 2NF, 3NF, BCNF, 4NF, 5NF, De-normalization. Relational Algebra: Select operation, Project operation, Union operation, Cartesian Product operation, Intersection operation, Join operation, Different types of joins (Inner join, Outer join, Self join).	11
IV	**Transaction:** Introduction, Desirable properties of transaction (ACID), Concurrency control techniques. Serializability.	11

Text Books, Reference Books and Others

Text Books Recommended:

- Database system concept, H. Korth and A. Silberschatz, TMH Publications.
- Data Base Management System, Alexies & Mathews,Vikash publication.
- Data Base Management System, C. J. Date ,Narosha Publication.
- Data Base Management System By James Matin.

Reference Books Recommended:

- Principles of Database System By Ullman.
- Program Design, Peter Juliff, PHI Publications.
- The Complete Reference, Kevin Loney, Oracle Press.
- SQL, PL/SQL The Programming Language of Oracle, Ivan Bayross , PustakKosh Publication.
- Microsoft SQL Server Management and Administration, Ross, STM Publications.

Online Resources:

- SWAYAM URL link for DBMS and RDBMS: https://youtu.be/f6LGtJutWyA
- SWAYAM URL link for DBMS and RDBMS: https://youtu.be/IoL9Ve2SRwQ
- SWAYAM URL link for DBMS and RDBMS: https://**swayam**.gov.in/courses/4434-data-base-management-system.
- Introduction of DBMS from SWAYAM: https://onlinecourses.swayam2.ac.in/ccc19_cs05/preview
- Introduction of RDBMS from SWAYAM : https://onlinecourses.nptel.ac.in/noc19_cs46/preview
- Introduction to DMBS: https://www.w3schools.in/dbms/intro
- Data independence: https://www.w3schools.in/dbms/data-independence
- Generalization and Aggregation: https://www.w3schools.in/dbms/generalization-aggregation
- Introduction to DMBS: https://www.javatpoint.com/dbms-tutorial

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)
FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VII**	Subject: **Computer Science**
Course Type: **GE LAB**	Course Code:
Course Title:	**LAB – Relational Database Management System**
Credit: 1	Lecture: **30**
M.M. 50 = 50 (Internal 10 + Practical (Practical) Record – 20 + Practical 10 + Viva 10)	Minimum Passing Marks: **40%**

Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Learn about Database Concepts, Architecture, various Users, Data Models and Data Management which helps them to interact with various Databases. • Develop various Tables and Databases which helps them to develop new Software. • Practice various SQL commands which helps them to generate new relationships among various Tables and Databases which are useful for Software Development. • Familiar with RDBMS Software like Oracle and SQL Server which are used as Backend for Software Development. • Develop new Databases for their Minor and Major Project Development which enhances their Data Storage, Data Accessibility and Data Management.
Credit Value	**1 Credits**	*Credit =30 Hours Laboratory or Field Learning/Training*

Total Marks	Max. Marks:	50	Min Passing Marks:	20

PART B- Content of the Course

Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)

Module	Topics (Course contents)	No. of Period

List of Practical Experiments	1. Design an employee table in Oracle/SQL Server having eid(primary key) ename, edesignation, edoj, edob, eaddress, salary, econtact as fields and answer the following questions :
	  a) Insert five records in above created table.
	  b) Display all five records.
	  c) Delete the fourth record.
	  d) Update the third record of the field ename as 'hari'.
	  e) Add one new field in the table.
	2. Design a salary table Oracle/SQL Server with one primary key and foreign key(employee table) having following fields :
	Month, working days, deptid, gross, incentive, deduction and net salary.
	  a) Insert five records in the above created table.
	  b) Display all five records.
	  c) Use foreign key relations and display records.
	  d) Update the second record of field deptid as 'Sales'.
	  e) Add one new field in the table.
	3. Create a new user in Oracle/SQL Server.
	4. Create a view in Oracle/SQL Server.
	5. Create a new table in Oracle/SQL Server and practice for join operation.
	6. Create a new user in Oracle/SQL Server and practice for the commit and rollback command.
		30
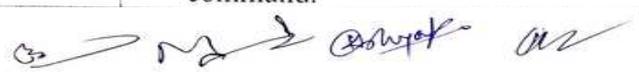
7. Create a new database in Oracle/SQL Server having at least five tables for the Hotel Management System.
8. Create a new database in Oracle/SQL Server having at least four tables for Covid Vaccination Management System.
9. Create a new database in Oracle/SQL Server having at least five tables for the Library Management System.
10. Create a new table in Oracle/SQL Server and practice for Group by and Order by Clause.
11. Create a new table in Oracle/SQL Server and practice for max(), min(), avg() and count() functions.
12. Create a new table in Oracle/SQL Server and practice for lower(), substr(),trim() and upper() functions.
13. Create a new table in Oracle/SQL Server and practice for unique and check constraints.
14. Create a new table in Oracle/SQL Server and practice for any two date formats.
15. Create a new table in Oracle/SQL Server and practice using clauses.
16. Create a new table in Oracle/SQL Server and practice for having clauses with sub queries.
17. Create a new table in Oracle/SQL Server and practice for aliases in any table.
18. Create a new table in Oracle/SQL Server and practice for inner and outer join.
19. Create a new table in Oracle/SQL Server and practice for Drop command.
20. Write a PL/SQL program for addition of two numbers.
21. Write a PL/SQL program to find the factorial value of any entered number.
22. Write a PL/SQL program for swapping of two numbers.
23. Write a PL/SQL program to print the first ten Natural Numbers.
24. Write a PL/SQL program to generate even series upto five digits starting from 2 and sum all the terms.
25. Write a PL/SQL program to practice for implicit and explicit cursors.

Text Books, Reference Books and Others

Text Books Recommended:
- Database system concept, H. Korth and A. Silberschatz, TMH Publications.
- Data Base Management System, Alexies & Mathews,Vikash publication.
- Data Base Management System, C. J. Date ,Narosha Publication.
- Data Base Management System By James Matin.

Reference Books Recommended:
- Principles of Database System by Ullman.
- Program Design, Peter Juliff, PHI Publications.
- The Complete Reference, Kevin Loney, Oracle Press.

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)
FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VIII (Honors Course)**	Subject: **Computer Science**
Course Type: **DSC**	Course Code:
Course Title:	**Web Technology**
Credit: **4 (3 Theory + 1 Practical)**	Lecture: **45**
M.M. 100 = **Theory (ESE 80 + IA 20)** (Theory)	Minimum Passing Marks: **40%**
M.M. 50 = 50 (Internal 10 + Practical (Practical) Record – 20 + Practical 10 + Viva 10)	Minimum Passing Marks: **40%**

Course Learning. Outcomes (CLO)	At the end of this course, the students will be able to: • Analyze a web page and identify its elements and attributes. • Create web pages using HTML, CSS, JAVASCRIPT, XHTML • Build dynamic web pages using JavaScript (Client-side programming). • Create XML documents and Schemas. • Build interactive web applications using PHP, AJAX. • Handling MySQL Database using PHP.
Credit Value	3 Credits	*Credit = 15 Hours - Learning & Observation*
Total Marks	Max. Marks: 100	Min Passing Marks: 40

Content of the Course

Total No. of Teaching–Learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	Topics (Course contents)	No. of Period
I	**Introduction:** Fundamentals of web technology: Webpages, website, browser, client, web servers, Basics of HTML CSS, Scripting Languages, MySQL, PHP etc., protocols governing the web, Web applications. Web Publishing: Introduction, Domain Name Registration, choosing a web host and signing up for an Account, web hosting. IDE for web development.	12
II	**HTML:** Introduction, Basic formatting tags: heading, paragraph, line break, bold, italic, underline, superscript, subscript, font and image. Different attributes like align, color, bgcolor, font face, border, size, Navigation Links using anchor tag: internal, external, mail and image links, Link to different web pages and sections. Lists: ordered, unordered and definition, Table tag, image tag, iframe tag. HTML Form controls: form, text, password, text area, button, checkbox, radio button, select box, hidden controls, Frameset and frames. Basics of DHTML, introduction of XML and its uses. Introduction of AJAX.	11
III	**CSS and Scripting Languages:** Introduction and features of CSS, CSS syntax, Creating Style sheets, CSS selectors (simple selector, combinator selectors, pseudo-class-selectors, pseudo-element-selectors, attribute selector), different ways to insert the CSS, different styling attributes and their settings like color, background, font, text, margin, position, border etc. **JavaScript:** introduction and features of java script, Syntax & Conventions, Variables, Expression, Branching & Looping, Function, Array, Objects, Events and Document Object model, Alerts, prompts and conforms.	11
IV	**PHP:** Introduction and features of PHP, data types, operators, control statements and looping, functions, array, string and string functions, object oriented, programming features of PHP: class-objects, abstraction, encapsulation, constructor, destructor, inheritance, polymorphism etc., Exception Handling. Handling HTML forms with PHP, Working with files and directories, session and cookies, PHP functions for Database Connectivity and basic operation with MySQL.	11

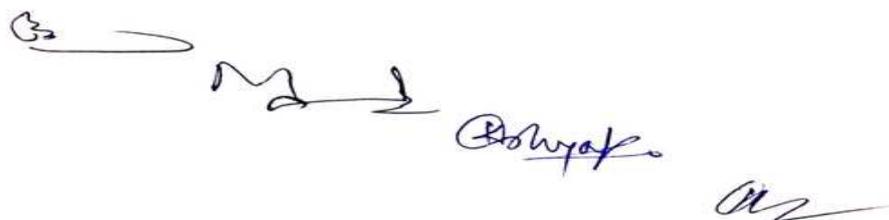| Text Books, Reference Books and Others |
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Text Books Recommended:

- Xavier, C, Web Technology and Design, New Age International.
- Ivan Bayross, HTML, DHTML, Java Script, Perl & CGI, BPB Publication.
- Ramesh Bangia, Internet and Web Design, New Age International.
- Ullman, PHP for the Web: Visual QuickStart Guide, Pearson Education.

Reference Books Recommended:

- Jim Converse & Joyce Park, PHP & MySQL Bible, Wiley India Publication
- Chuck Musiano & Bill Kenndy, O Reilly, HTML The Definitive Guide
- Joseph Schmuller, Dynamic HTML, BPB, 2000.
- Deitel, Deitel, Goldberg, Internet & World Wide Web How to Program, Pearson Education,
- Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.

Online Resources:

- Swayam Portal : Web technology:
  Web Technology - Course (swayam2.ac.in)
- W3schools: Web development Programming and Scripting Languages:
  https://www.w3schools.com
- Fundamentals of PHP:
  PHP Tutorial (tutorialspoint.com)
- IIT Kharagpur YouTube Link: Database and SQL
  https://youtube.com/playlist?list=PLIwC9bZ0rmjSkm1VRJROX4vP2YMIf4Ebh&si=Z5JJlgtFMUWTf Ntg
- NPTEL: SQL
  https://youtube.com/playlist?list=PLLQPIumE5cEgzU5hChH1V3H93x4UOlHR&si=2dxqvodFZcnQUu dR

FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VIII (Honors Course)**	Subject: **Computer Science**
Course Type: **DSC - LAB**	Course Code:
Course Title:	**LAB - Web Technol0ogy**
Credit: 1	Lecture: **30**
M.M. 50 = 50 (Internal 10 + Practical (Practical) Record – 20 + Practical 10 + Viva 10)	Minimum Passing Marks: **40%**

Course Learning. Outcomes (CLO)	At the end of this course, the students will be able to: • Analyze a web page and identify its elements and attributes. • Create web pages using HTML, CSS, JAVASCRIPT, XHTML • Build dynamic web pages using JavaScript (Client-side programming). • Create XML documents and Schemas. • Build interactive web applications using PHP, AJAX. • Handling MySQL Database using PHP.
Credit Value	1 Credits	Credit =30 Hours Laboratory or Field Learning/Training
Total Marks	Max. Marks: 50	Min Passing Marks: 20

Content of the Course

Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)

Module	Topics (Course contents)	No. of Period
Lab./Field Training/ Experiment	**HTML** 1. Write HTML code to create the following table: 2. Write HTML code to create the following lists: • C • C++ • Fortran • COBOL 3. Write HTML code to create the following lists: 1. Java 2. Visual Basic 3. Basic 4. COBOL 4. Write HTML code to demonstrate hyper linking between two web pages. 5. Create a marquee & also insert an image. 6. Write HTML code to create a frame in HTML with 3 columns (width= 30%, 30%, 40%) and put hyperlinked pictures inside each. 7. Write HTML code to create a webpage with a blue background and print the following text with white background. "Hello Word " 8. Write HTML code to create the following table:	30

Table for item 1:

Class	Subject 1	Subject 2	Subject 3
BCA-I	Visual Basic	PC Software	Electronics
BCA-II	C++	DBMS	English
BCA-III	Java	Multimedia	CSA

Table for item 8:

Course	OC	BC	MB	SC/ST	Total

Computer Science	9	18	5	5	37
Commerce	14	25	6	5	50
Grand Total					87

9. Write HTML code to create the following table:

Maruti		Tata		Ford	
Model	Price	Model	Price	Model	Price
Maruti 800	2 Lac	Sumo	2 Lac	Icon	5 Lac
Omni	3 Lac	Scorpio	3 Lac	Gen	2 Lac

10. Write HTML code to create the following table:

Pandit Ravishankar Shukla University		
Name	Roll No.	Class
Rahul	40	BCA-I
Preeti	85	BCA-I
Priya	74	BCA-I
Richa	95	BCA-I

11. Write HTML code to create the following table:

Students Record

Name	Subject	Marks
Arun	Java	70
	C	80
Ashish	Java	75
	C	69

12. Write HTML code to create the following table and also insert an image in the webpage.

Subject	Max	Min	Obtain
Java	100	33	75
Multimedia	100	33	70
Operating System	100	33	68
C++	100	33	73

13. Write HTML code to create the following table:

Name		Rahul	
Roll No.		101	
Subject	Max	Min	Obtain
Java	100	33	75
Multimedia	100	33	70

14. Write HTML code to create a form as the following:

Enter Name : _____

Enter Roll No. : _____

Enter Age : _____

Enter DOB : _____

15. Write HTML code to create the following form:
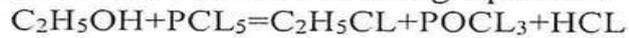
User Name : [   ]

Password : [   ]

When user types characters in a password
field. The browser displays asterisks or
bullets instead of character.

[Submit]

16. Write HTML code to create Student Registration Form
17. Write HTML code to create Contact Form
18. Write HTML code to insert Audio & Video in HTML
19. Write HTML code for the following equations:

$$C_2H_5OH+PCL_5=C_2H_5CL+POCL_3+HCL$$
$$4H_3PO_3=3H_3PO_4+PH_3$$
$$PCL_3+CL_2=PCL_5$$

20. Write the HTML code to display the following list:
    - Actors
        - Bruce Wills
        - Gerand Butler
        - Vin Diesel
        - Bradd Pitt
        - Paul Walker
        - Jason Statham
    - Actress
        - Julia Roberts
        - Angelina Jolie
        - Kate Wins let
        - Cameron Diaz

21. Write the HTML code to display the following list:
    1. Cricket Players
        A. Batsman
            i. Sachin Tendulkar
            ii. Rahul Dravid
            iii. Virendra Sehwag
        B. Bowlers
            i. Kumble
            ii. Zaheer Khan
            iii. Balaji
        C. Spinner
            i. Harbhajan
            ii. Ravindra Jadeja
            iii. Kartik

****

JavaScript

1. Write a java script, to print prime numbers from 1 and 50.
2. Write a script to get the largest value in an array.
3. Write a function to calculate the factorial of a number (a non-negative integer).
4. Write a script to demonstrate data validation.
5. Write a program to print dates using JavaScript.
6. Write a program to Sum and Multiply two numbers using JavaScript.

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DHTML

1. Create a web page which shows the changes of header dynamically.

2. Create a webpage which explains the use of relative positioning.
3. Display an alert box to alert the x and y coordinates of the cursor.

****

PHP

1. write script using for loop to print all integer between -10 to 10
2. write script to construct the following pattern, using nested for loop

```
1
1  2
1  2  3
1  2  3  4  5
```

3. Write a PHP script to get the largest key in an array.
4. Write a function to calculate the factorial of a number (a non-negative integer).
5. Write a PHP script to check string for palindrome.
6. Write a PHP script to collect the data from the registration form designed in HTML, and submit it to the database.
7. Write a PHP script to read the data from the database and display it into the web page in tabular form.

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MySQL

Task - I

Create the following table in MySQL:
       College (cname, city, caddress, cphone)
       Staffjoins (sid, cname, dept, doj, post, salary)
       Staffs (sid, sname, saddress , scontacts)
       Teaching (sid, class, paprid, fsession, tsession)
       Subject (paperid, subject, paper, papername)

Write the queries to perform the following operations.
1. List the name and post of a teacher teaching a computer subject.
2. List the name and city of all staff working in your college.
3. List the name and city of all staff working in your college who earn more than 15000.
4. Find the staff whose date of joining is 2005.
5. Find the staff whose names start with 'M' or 'R' and 'A' and/or 7 characters long.
6. Modify the database so that staffN1 now works in C2 college.
7. List maximum, average, minimum salary of each college.
8. Acquire details of staff by name in a college or each college.
9. List names of staff in ascending order according to salary who are working in all colleges.
10. Find the staff that earn a higher salary who earn greater than the average salary of their college.

Task - II

Create the following table MySQL:
Enrollment (enrollno, name, gender, DOB, address, phone)
Admission (adno, enrollno, course, yearsem, date, cname)
Feestucture (course_yearsem, fee)
Payment (billno, admno, amount, pdate,purpose)

Write the queries to perform the following operations.
1. Get full detail of all students who took admission this year class wise.
2. Get details of students who took admission in sai colleges.
3. Calculate the total amount of fees collected in this session.
4. List the students who have not paid full fees in your colleges.
5. List the number of admission in your college every year.
6. List the students in colleges in your city and also live in your city.

Task - III

Create the following table MySQL:
Subject (paperid, subject, paper, papername)
test(paperid,tdate,max,min)
score(rollno,paperid,marks,attendance)
students(admno,rollno,class,yearsem)

Write the queries to perform the following operations.
1. List roll no of students who were present in a paper of a subject.
2. List all roll numbers who have passed in first division.
3. List all students in BCA-II who have scored higher than average in your college.

Note: Concerned teacher can add additional practical exercises as per requirement.

Text Books, Reference Books and Others

Text Books Recommended:

- Xavier, C, Web Technology and Design, New Age International.
- Ivan Bayross, HTML, DHTML, Java Script, Perl & CGI, BPB Publication.
- Ramesh Bangia, Internet and Web Design, New Age International.
- Ullman, PHP for the Web: Visual QuickStart Guide, Pearson Education.

Reference Books Recommended:

- Jim Converse & Joyce Park, PHP & MySQL Bible, Wiley India Publication
- Chuck Musiano & Bill Kenndy, O Reilly, HTML The Definitive Guide
- Joseph Schmuller, Dynamic HTML, BPB, 2000.
- Deitel, Deitel, Goldberg, Internet & World Wide Web How to Program,Pearson Education,
- Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.

Online Resources:

- Swayam Portal : Web technology: Web Technology - Course (swayam2.ac.in)

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)
FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VIII (Honors Course)**	Subject: **Computer Science**
Course Type: **DSE - I**	Course Code:
Course Title:	**Cloud Computing**
Credit: **4 (Theory)**	Lecture: **60**
M.M. 100 = **Theory (ESE 80 + IA 20)** (Theory)	**Minimum Passing Marks: 40%**

Course Learning Outcomes (CLO)	After Completing this course, students will be able to: • Understand the concepts, characteristics and benefits of cloud computing. • Understand the key security and compliance challenges of cloud computing. • Understand the concept of Cloud Security and governance. • Learn the Concept of Cloud Infrastructure Model. • Understand the cloud storage, Cloud Virtualization & Micro services.	
Credit Value	**4 Credits**	*Credit = 15 Hours - Learning & Observation*
Total Marks	Max. Marks: 100	Min Passing Marks: 40

Content of the Course

Total No. of Teaching–Learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	Topics (Course contents)	No. of Period
I	**Fundamental Cloud Computing:** Concepts, Terminology, Technologies, Benefits, Challenges, SLAs and business cost metrics associated with cloud computing, SaaS, IaaS, PaaS delivery models, Common cloud deployment models and cloud characteristics, Various applications of cloud computing. **Cloud Architecture:** The technology architecture of cloud platforms and cloud-based solutions and services and their utilization via a set of cloud computing design patterns, Hybrid cloud deployment models, Compound design patterns and solution architectures that span cloud and on-premise environments.	15
II	**Cloud Security & Governance:** The cloud security mechanisms, cloud security architecture, A set of security design patterns, The definition of cloud governance precepts, Roles, Practices and processes, Common governance challenges and pitfalls specific to cloud computing.	15
III	**Cloud Storage:** The cloud storage devices, Structures and technologies, cloud storage mechanisms, Persistent storage, Redundant storage, Cloud-attached storage, Cloud-remote storage, Cloud storage gateways, Cloud storage brokers, Direct Attached Storage (DAS), Network Attached Storage (NAS), Storage Area Network (SAN), Various cloud storage-related design patterns.	15
IV	**Cloud Virtualization & Microservices:** Core topic areas pertaining to the fundamental virtualization mechanisms and types used within contemporary cloud computing platforms are explored along with various key performance indicators and related metrics, Microservices of Cloud Computing.	15

Text Books, Reference Books and Others

Text Books Recommended:

- Distributed Computing by Dollymore Cloud Computing (Wind) by Dr. Kumar Saurabh, 2nd Edison, Wiley India.

Reference Books Recommended:

- Cloud Computing: Principles and Paradigms, Editors: Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Wile, 2011 Cloud Computing: Principles, Systems and Applications, Editors: Nikos Antonopoulos, Lee Gillam, Springer, 2012.
- Handbook of Cloud Computing by Anand Nayyar, Publisher: BPB Publication.

Online Resources:

- Introduction to Cloud Computing from W3shool:
  https://www.w3schools.in/cloud-computing/tutorials/
- Introduction to Cloud Computing from Coursera:
  https://www.coursera.org/learn/introduction-to-cloud
- Cloud Computing Basics:
  https://www.coursera.org/learn/cloud-computing-basics
- Cloud Computing Concepts:
  https://www.coursera.org/learn/cloud-computing
- Cloud Computing Specialization from Coursera:
  https://www.coursera.org/specializations/cloud-computing
- Cloud Computing from SWAYAM/NPTEL: https://onlinecourses.nptel.ac.in/noc22_cs20/preview
  https://www.youtube.com/channel/UCK73cnkjfQNDwdBqMyaMtRg
- Cloud Computing Basics:
  https://terrorgum.com/tfox/books/cloudcomputingbasics_aselfteachingintroduction.pdf
- CLOUD COMPUTING Principles and Paradigms :
  https://dhoto.lecturer.pens.ac.id/lecture_notes/internet_of_things/CLOUD%20COMPUTING%20Principles%20and%20Paradigms.pdf
- Cloud Computing Tutorial For Beginners: https://www.youtube.com/watch?v=fLV_t2qKYyU
- Introduction to Cloud Computing: https://www.youtube.com/watch?v=Dv0sjAYnVCY
- Cloud Computing Tutorials: https://www.youtube.com/watch?v=NvA9PB6i8bg

FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VIII (Honors Course)**	Subject: **Computer Science**
Course Type: **DSE - II**	Course Code:
Course Title:	**Cyber Security and Cyber Law**
Credit: **4 (Theory)**	Lecture: **60**
M.M. 100 = **Theory (ESE 80 + IA 20) (Theory)**	**Minimum Passing Marks: 40%**

Course Learning Outcomes(CLO)	At the end of this course, students will be able to: • Understand the fundamental concepts in cyber security and distinguish among the attacks, thre... l vulnerabilities. • Identify, differentiate a... lain different cyber crimes and frauds. • Understand the concept ...ber security issues and challenges associated with it. • Understand the cyber c... their nature, legal remedies and how to report the crimes through avai... platforms and procedures. • Understand the basic ...epts related to E-Commerce and digital payments.
Credit Value	**4 Credits** | *Credit = 1ɔ Hours -Learning & Observation*
Total Marks	Max. Marks: 100 | **Min Passing Marks: 40**

B: Content of the Course

Total No. of Teaching– Learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	Topics (Course contents)	No. of Period
I	**Introduction:** Defining Cyberspace, Architecture of cyberspace, Internet, World wide web, Internet society, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security, Cyber Physical System Security, Classification of cyber crimes, Common cyber crimes- cyber crime targeting computers and mobiles, cyber crime against women and children, financial frauds, social engineering attacks, malware and ransomware attacks, zero day and zero click attacks, Cybercriminals modus-operandi, Reporting of cyber crimes, Remedial and mitigation measures.	15
II	**Authentication:** Vulnerability and vulnerability assessment, Intrusion Detection and Intrusion Prevention System, Introduction of Authentication, User Authentication Methods, Biometric Authentication Methods.	15
III	**Different Securities:** Window Security, Smartphone Security, Browser Security, Web Security, Email Security, Wi-Fi Security, and Social Media Security: Challenges, opportunities and pitfalls in online social network, Best practices for the use of Social media, Introduction to digital payments, Components of digital payment and stakeholders, Digital payments related common frauds and preventive measures. RBI guidelines on digital payments and customer protection in unauthorized banking transactions.	15
IV	**Cyber Law Basics:** Information Technology Act 2000-Amendments; Laws regarding posting of inappropriate content, Relevant provisions of Payment Settlement Act 2007, Cybercrimes and offenses dealt with IPC, RBI Act, IPR in India.	15

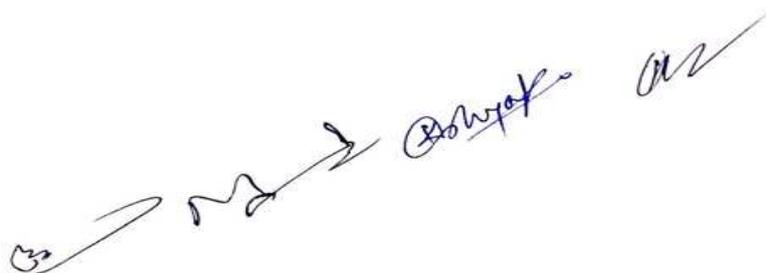**Text Books, Reference Books and Others**

Text Books Recommended:

- Cyber criminology: Exploring Internet Crimes and Criminal Behavior by K. Jaishankar, CRC press.
- Data communication and Networking by B. Forouzan, TMH.
- An unofficial guide to ethical hacking by Ankit Fadia, trinity publisher.
- An ethical guide to hacking mobile phones by Ankit Fadia, trinity publisher.
- Computer Network Security and Cyber Ethics by Siva Ram Murthy,B.S. Manoj , McFarland and Company , INC

Reference Books Recommended:

- Cyber Crime Impact in the New Millennium, by R. C Mishra , Auther Press. Edition 2010.
- Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011)
- Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver, Create Space Independent Publishing Platform. (Pearson , 13th November, 2001)
- Electronic Commerce by Elias M. Awad, Prentice Hall of India Pvt Ltd.
- Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers.
- Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt. Ltd.
- Fundamentals of Network Security by E. Maiwald, McGraw Hill.

Online Resources:

- Cyber Security from SWAYAM: https://onlinecourses.swayam2.ac.in/cec21_cs09/preview
- Introduction to Cyber Security from SWAYAM: https://onlinecourses.swayam2.ac.in/nou20_cs01/preview
- Cyber Security for Beginners: https://heimdalsecurity.com/pdf/cyber_security_for_beginners_ebook.pdf
- Cyber Criminology by K. Jaishankar: https://larose.staff.ub.ac.id/files/2011/12/Cyber-Criminology-Exploring-Internet-Crimes-and-Criminal-Behavior.pdf
- Fundamental of Cyber Security by Dr. Jitendra Pandey: http://www.uou.ac.in/sites/default/files/slm/FCS.pdf
- Information Technology Act 2000: https://www.meity.gov.in/content/information-technology-act-2000
- Information Technology Act: https://www.meity.gov.in/content/information-technology-act
- Cyber Crime Law and Practice: https://www.icsi.edu/media/webmodules/publications/Cyber_Crime_Law_and_Practice.pdf

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)
FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VIII (Honors Course)**	Subject: **Computer Science**
Course Type: **DSE - III**	Course Code:
Course Title:	**Advance Operating System**
Credit: **4 (Theory)**	Lecture: **60**
M.M. 100 = **Theory (ESE 80 + IA 20)** (Theory)	**Minimum Passing Marks: 40%**

Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Gain knowledge about advanced concepts of OS. • Understand the concept of distributed systems. • Understand process synchronisation and concurrency control. • Understand the architecture and functioning of mobile operating system. • Develop modules for mobile devices. • Understand the architecture of various advanced operating system.

Credit Value	4 Credits	Credit = 15 Hours - Learning & Observation	
Total Marks	Max. Marks: 100	Min Passing Marks: 40	

Content of the Course

Total No. of Teaching–Learning Periods (01 Hr. per period) – 60 Periods (60 Hours)

Unit	Topics (Course contents)	No. of Period
I	**Multiprocessor Operating Systems:** System Architectures, Structures of OS, OS design issues, Process synchronization, Process Scheduling and Allocation, memory management.	15
II	**Distributed Operating Systems:** System Architectures, Design issues, Communication models, clock synchronization, mutual exclusion, election algorithms, Distributed Deadlock detection, Distributed scheduling, Distributed shared memory, Distributed File system, Multimedia file systems, File placement, Caching.	15
III	**Database Operating Systems:** Requirements of Database OS, Transaction process model, Synchronization primitives, Concurrency control algorithms.	15
IV	**Mobile Operating Systems:** ARM and Intel architectures, Power Management, Mobile OS Architectures, Underlying OS, Kernel structure and native level programming, Runtime issues, Approaches to power management.	15

Text Books, Reference Books and Others

Text Books Recommended:

- Mukesh Singhal, Niranjan Shivaratri, "Advanced Concepts in Operating Systems", TMH, 2001
- William Stallings, "Operating Systems – Operating System: Internals and Design Principles", Prentice Hall, 2005.

Reference Books Recommended:

- Andrew S. Tanenbaum, "Distributed Operating Systems", Pearson Education, 1995.
- Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, "Operating System Principles", John Wiley & Sons Inc., 2006.

Online Resources:

- Advanced Concepts in Operating Systems:
  https://books.google.co.in/books/about/Advanced_Concepts_in_Operating_Systems.html?id=ajx9NAEACAAJ&redir_esc=y
- Distributed Operating System:
  https://www.javatpoint.com/distributed-operating-system
- Mobile Operating System
  https://www.sciencedirect.com/topics/computer-science/mobile-operating-system
  https://baou.edu.in/assets/pdf/PGDMAD_101_slm.pdf
- Database operating System:
- https://www.redswitches.com/blog/database-operating-system/#:~:text=A%20Database%20Operating%20System%20(DBOS,storage%2C%20retrieval%2C%20and%20manipulation.
  https://www.ibm.com/docs/en/psfa/7.2.1?topic=logs-database-operating-system
  https://eecs.berkeley.edu/230426-2/

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)
FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VIII (Honors Course)**	Subject: **Computer Science**
Course Type: **DSE - IV**	Course Code:
Course Title:	**Principles of Compiler Design**
Credit: **4 (Theory)**	Lecture: **60**
M.M. 100 = **Theory (ESE 80 + IA 20) (Theory)**	**Minimum Passing Marks: 40%**

Course Learning Outcome: (CLO)	• Specify and analyze the lexical, syntactic and semantic structures of advanced language features • Separate the lexical, syntactic and semantic analysis into meaningful phases for a compiler to undertake language translation • Write a scanner, parser, and semantic analyzer without the aid of automatic generators • Turn fully processed source code for a novel language into machine code for a novel computer • Describe techniques for intermediate code and machine code optimization • Design the structures and support required for compiling advanced language features.

Units	Topic (Course Contents)	No of Periods
I	Introduction to Compilers: Overview, Structure, implementation. Programming Language Grammars: Inter Language grammars, derivation, reduction, syntax tree, ambiguity, regular grammars & expressions.	15
II	Scanning and Parsing Techniques : The Scanner, parser, translation, elementary symbol table organization,structures.	15
III	Memory Allocation: Static and dynamic memory allocation, array allocation and access, allocation for strings, structure allocation, common & equivalence allocation. Introduction to Compilation of expressions.	15
IV	Compilation of Control Structures : Control transfers, procedural calls, conditional execution, iteration control constructs. Error detection, indication & recovery. Code Optimization: Major issues, optimizing transformations, local optimizations, program flow analysis, Global Optimization.	15

BOOKS RECOMMENDED:
1. Compiler Construction -D.M.Dhandhere(M)
2. Compiler Writing -Tremble-Sorenson(TMH)
3. Computers : Princ, Techniques cools by Aho-Person.
4. The Essence of Compilers by Hanter-Pearson.

FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VIII (Honors with Research Course)**	Subject: **Computer Science**
Course Type: **DSC**	Course Code:
Course Title:	**Web Technology**
Credit: **4 (3 Theory + 1 Practical)**	Lecture: **45**
M.M. 100 = **Theory (ESE 80 + IA 20)** (Theory)	Minimum Passing Marks: **40%**
M.M. 50 = 50 (Internal 10 + Practical (Practical) Record – 20 + Practical 10 + Viva 10)	Minimum Passing Marks: **40%**

Course Learning. Outcomes (CLO)	At the end of this course, the students will be able to: • Analyze a web page and identify its elements and attributes. • Create web pages using HTML, CSS, JAVASCRIPT, XHTML • Build dynamic web pages using JavaScript (Client-side programming). • Create XML documents and Schemas. • Build interactive web applications using PHP, AJAX. • Handling MySQL Database using PHP.	
Credit Value	3 Credits	Credit = 15 Hours - Learning & Observation
Total Marks	Max. Marks: 100	Min Passing Marks: 40

Content of the Course

Total No. of Teaching–Learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	Topics (Course contents)	No. of Period
I	**Introduction:** Fundamentals of web technology: Webpages, website, browser, client, web servers, Basics of HTML CSS, Scripting Languages, MySQL, PHP etc., protocols governing the web, Web applications. Web Publishing: Introduction, Domain Name Registration, choosing a web host and signing up for an Account, web hosting. IDE for web development.	12
II	**HTML:** Introduction, Basic formatting tags: heading, paragraph, line break, bold, italic, underline, superscript, subscript, font and image. Different attributes like align, color, bgcolor, font face, border, size, Navigation Links using anchor tag: internal, external, mail and image links, Link to different web pages and sections. Lists: ordered, unordered and definition, Table tag, image tag, iframe tag. HTML Form controls: form, text, password, text area, button, checkbox, radio button, select box, hidden controls, Frameset and frames. Basics of DHTML, introduction of XML and its uses. Introduction of AJAX.	11
III	**CSS and Scripting Languages:** Introduction and features of CSS, CSS syntax, Creating Style sheets, CSS selectors (simple selector, combinator selectors, pseudo-class-selectors, pseudo-element-selectors, attribute selector), different ways to insert the CSS, different styling attributes and their settings like color, background, font, text, margin, position, border etc. **JavaScript:** introduction and features of java script, Syntax & Conventions, Variables, Expression, Branching & Looping, Function, Array, Objects, Events and Document Object model, Alerts, prompts and conforms.	11
IV	**PHP:** Introduction and features of PHP, data types, operators, control statements and looping, functions, array, string and string functions, object oriented, programming features of PHP: class-objects, abstraction, encapsulation, constructor, destructor, inheritance, polymorphism etc., Exception Handling. Handling HTML forms with PHP, Working with files and directories, session and cookies, PHP functions for Database Connectivity and basic operation with MySQL.	11

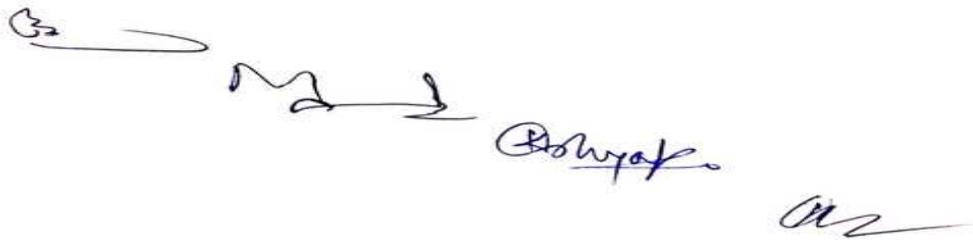| Text Books, Reference Books and Others |
| --- |

Text Books Recommended:

- Xavier, C, Web Technology and Design, New Age International.
- Ivan Bayross, HTML, DHTML, Java Script, Perl & CGI, BPB Publication.
- Ramesh Bangia, Internet and Web Design, New Age International.
- Ullman, PHP for the Web: Visual QuickStart Guide, Pearson Education.

Reference Books Recommended:

- Jim Converse & Joyce Park, PHP & MySQL Bible, Wiley India Publication
- Chuck Musiano & Bill Kenndy, O Reilly, HTML The Definitive Guide
- Joseph Schmuller, Dynamic HTML, BPB, 2000.
- Deitel, Deitel, Goldberg, Internet & World Wide Web How to Program,Pearson Education,
- Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.

Online Resources:

- Swayam Portal : Web technology:
  Web Technology - Course (swayam2.ac.in)
- W3schools: Web development Programming and Scripting Languages:
  https://www.w3schools.com
- Fundamentals of PHP:
  PHP Tutorial (tutorialspoint.com)
- IIT Kharagpur YouTube Link: Database and SQL
  https://youtube.com/playlist?list=PLlwC9bZ0rmjSkm1VRJROX4vP2YMIf4Ebh&si=Z5JJlgtFMUWTf
  Ntg
- NPTEL: SQL
  https://youtube.com/playlist?list=PLLQPIumE5cEgzU5hChH1V3H93x4UOlHR&si=2dxqvodFZcnQUu
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FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VIII (Honors with Research Course)**	Subject: **Computer Science**
Course Type: **DSC - LAB**	Course Code:
Course Title:	**LAB - Web Technol0ogy**
Credit: 1	Lecture: **30**
M.M. 50 = 50 (Internal 10 + Practical (Practical) Record – 20 + Practical 10 + Viva 10)	Minimum Passing Marks: **40%**

Course Learning. Outcomes (CLO)	At the end of this course, the students will be able to: • Analyze a web page and identify its elements and attributes. • Create web pages using HTML, CSS, JAVASCRIPT, XHTML • Build dynamic web pages using JavaScript (Client-side programming). • Create XML documents and Schemas. • Build interactive web applications using PHP, AJAX. • Handling MySQL Database using PHP.
Credit Value	1 Credits	*Credit =30 Hours Laboratory or Field Learning/Training*
Total Marks	Max. Marks: 50	Min Passing Marks: 20

: Content of the Course

Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)

Module	Topics (Course contents)	No. of Period
Lab./Field Training/ Experiment	**HTML** 1. Write HTML code to create the following table: 	Class	Subject 1	Subject 2	Subject 3
---	---	---	---
BCA-I	Visual Basic	PC Software	Electronics
BCA-II	C++	DBMS	English
BCA-III	Java	Multimedia	CSA | 2. Write HTML code to create the following lists: • C • C++ • Fortran • COBOL 3. Write HTML code to create the following lists: 1. Java 2. Visual Basic 3. Basic 4. COBOL 4. Write HTML code to demonstrate hyper linking between two web pages. 5. Create a marquee & also insert an image. 6. Write HTML code to create a frame in HTML with 3 columns (width= 30%, 30%, 40%) and put hyperlinked pictures inside each. 7. Write HTML code to create a webpage with a blue background and print the following text with white background. "Hello Word " 8. Write HTML code to create the following table: | Course	OC	BC	MB	SC/ST	Total		30

Computer Science	9	18	5	5	37
Commerce	14	25	6	5	50
Grand Total					87

9. Write HTML code to create the following table:

Maruti		Tata		Ford	
Model	Price	Model	Price	Model	Price
Maruti 800	2 Lac	Sumo	2 Lac	Icon	5 Lac
Omni	3 Lac	Scorpio	3 Lac	Gen	2 Lac

10. Write HTML code to create the following table:

Pandit Ravishankar Shukla University		
Name	Roll No.	Class
Rahul	40	BCA-I
Preeti	85	BCA-I
Priya	74	BCA-I
Richa	95	BCA-I

11. Write HTML code to create the following table:

Students Record

Name	Subject	Marks
Arun	Java	70
	C	80
Ashish	Java	75
	C	69

12. Write HTML code to create the following table and also insert an image in the webpage.

Subject	Max	Min	Obtain
Java	100	33	75
Multimedia	100	33	70
Operating System	100	33	68
C++	100	33	73

13. Write HTML code to create the following table:

Name		Rahul		
Roll No.		101		
Subject	Max	Min	Obtain	
Java	100	33	75	
Multimedia	100	33	70	

14. Write HTML code to create a form as the following:

Enter Name :

Enter Roll No. :

Enter Age :

Enter DOB :

15. Write HTML code to create the following form:

User Name : [   ]
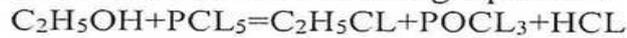
Password : [   ]

When user types characters in a password field. The browser displays asterisks or bullets instead of character.

[Submit]

16. Write HTML code to create Student Registration Form
17. Write HTML code to create Contact Form
18. Write HTML code to insert Audio & Video in HTML
19. Write HTML code for the following equations:
    $$C_2H_5OH+PCL_5=C_2H_5CL+POCL_3+HCL$$
    $$4H_3PO_3=3H_3PO_4+PH_3$$
    $$PCL_3+CL_2=PCL_5$$
20. Write the HTML code to display the following list:
    - Actors
        - Bruce Wills
        - Gerand Butler
        - Vin Diesel
        - Bradd Pitt
        - Paul Walker
        - Jason Statham
    - Actress
        - Julia Roberts
        - Angelina Jolie
        - Kate Wins let
        - Cameron Diaz
21. Write the HTML code to display the following list:
    1. Cricket Players
        A. Batsman
            i. Sachin Tendulkar
            ii. Rahul Dravid
            iii. Virendra Sehwag
        B. Bowlers
            i. Kumble
            ii. Zaheer Khan
            iii. Balaji
        C. Spinner
            i. Harbhajan
            ii. Ravindra Jadeja
            iii. Kartik

****

JavaScript

1. Write a java script, to print prime numbers from 1 and 50.
2. Write a script to get the largest value in an array.
3. Write a function to calculate the factorial of a number (a non-negative integer).
4. Write a script to demonstrate data validation.
5. Write a program to print dates using JavaScript.
6. Write a program to Sum and Multiply two numbers using JavaScript.

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DHTML

1. Create a web page which shows the changes of header dynamically.

2. Create a webpage which explains the use of relative positioning.
3. Display an alert box to alert the x and y coordinates of the cursor.

****

PHP
1. write script using for loop to print all integer between -10 to 10
2. write script to construct the following pattern, using nested for loop

```
1
1  2
1  2  3
1  2  3  4  5
```

3. Write a PHP script to get the largest key in an array.
4. Write a function to calculate the factorial of a number (a non-negative   integer).
5. Write a PHP script to check string for palindrome.
6. Write a PHP script to collect the data from the registration form designed in HTML, and submit it to the database.
7. Write a PHP script to read the data from the database and display it into the web page in tabular form.

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MySQL

Task - I

Create the following table in MySQL:
        College (cname, city, caddress, cphone)
        Staffjoins (sid, cname, dept, doj, post, salary)
        Staffs (sid, sname, saddress , scontacts)
        Teaching (sid, class, paprid, fsession, tsession)
        Subject (paperid, subject, paper, papername)

Write the queries to perform the following operations.
1. List the name and post of a teacher teaching a computer subject.
2. List the name and city of all staff working in your college.
3. List the name and city of all staff working in your college who earn more than 15000.
4. Find the staff whose date of joining is 2005.
5. Find the staff whose names start with 'M' or 'R' and 'A' and/or 7 characters long.
6. Modify the database so that staffN1 now works in C2 college.
7. List maximum, average, minimum salary of each college.
8. Acquire details of staff by name in a college or each college.
9. List names of staff in ascending order according to salary who are working in all colleges.
10. Find the staff that earn a higher salary who earn greater than the average salary of their college.

Task - II

Create the following table MySQL:
Enrollment (enrollno, name, gender, DOB, address, phone)
Admission (adno, enrollno, course, yearsem, date, cname)
Feestucture (course_yearsem, fee)
Payment (billno, admno, amount, pdate,purpose)

Write the queries to perform the following operations.
1. Get full detail of all students who took admission this year class wise.
2. Get details of students who took admission in sai colleges.
3. Calculate the total amount of fees collected in this session.
4. List the students who have not paid full fees in your colleges.
5. List the number of admission in your college every year.
6. List the students in colleges in your city and also live in your city.

Task - III

Create the following table MySQL:
Subject (paperid, subject, paper, papername)
test(paperid,tdate,max,min)
score(rollno,paperid,marks,attendance)
students(admno,rollno,class,yearsem)

Write the queries to perform the following operations.
1. List roll no of students who were present in a paper of a subject.
2. List all roll numbers who have passed in first division.
3. List all students in BCA-II who have scored higher than average in your college.

Note: Concerned teacher can add additional practical exercises as per requirement.

Text Books, Reference Books and Others

Text Books Recommended:

- Xavier, C, Web Technology and Design, New Age International.
- Ivan Bayross, HTML, DHTML, Java Script, Perl & CGI, BPB Publication.
- Ramesh Bangia, Internet and Web Design, New Age International.
- Ullman, PHP for the Web: Visual QuickStart Guide, Pearson Education.

Reference Books Recommended:

- Jim Converse & Joyce Park, PHP & MySQL Bible, Wiley India Publication
- Chuck Musiano & Bill Kenndy, O Reilly, HTML The Definitive Guide
- Joseph Schmuller, Dynamic HTML, BPB, 2000.
- Deitel, Deitel, Goldberg, Internet & World Wide Web How to Program,Pearson Education,
- Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.

Online Resources:

- Swayam Portal : Web technology: Web Technology - Course (swayam2.ac.in)

FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VIII (Honors with Research Course)**	Subject: **Computer Science**
Course Type: **DSE**	Course Code:
Course Title:	**Cloud Computing**
Credit: **4 (Theory)**	Lecture: **60**
M.M. 100 = **Theory (ESE 80 + IA 20)** (Theory)	**Minimum Passing Marks: 40%**

Course Learning Outcomes (CLO)	After Completing this course, students will be able to: • Understand the concepts, characteristics and benefits of cloud computing. • Understand the key security and compliance challenges of cloud computing. • Understand the concept of Cloud Security and governance. • Learn the Concept of Cloud Infrastructure Model. • Understand the cloud storage, Cloud Virtualization & Micro services.		
Credit Value	**4 Credits**	*Credit = 15 Hours - Learning & Observation*	
Total Marks	Max. Marks: 100	Min Passing Marks: 40	

Content of the Course

Total No. of Teaching–Learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	Topics (Course contents)	No. of Period
I	**Fundamental Cloud Computing:** Concepts, Terminology, Technologies, Benefits, Challenges, SLAs and business cost metrics associated with cloud computing, SaaS, IaaS, PaaS delivery models, Common cloud deployment models and cloud characteristics, Various applications of cloud computing. **Cloud Architecture:** The technology architecture of cloud platforms and cloud-based solutions and services and their utilization via a set of cloud computing design patterns, Hybrid cloud deployment models, Compound design patterns and solution architectures that span cloud and on-premise environments.	15
II	**Cloud Security & Governance:** The cloud security mechanisms, cloud security architecture, A set of security design patterns, The definition of cloud governance precepts, Roles, Practices and processes, Common governance challenges and pitfalls specific to cloud computing.	15
III	**Cloud Storage:** The cloud storage devices, Structures and technologies, cloud storage mechanisms, Persistent storage, Redundant storage, Cloud-attached storage, Cloud-remote storage, Cloud storage gateways, Cloud storage brokers, Direct Attached Storage (DAS), Network Attached Storage (NAS), Storage Area Network (SAN), Various cloud storage-related design patterns.	15
IV	**Cloud Virtualization & Microservices:** Core topic areas pertaining to the fundamental virtualization mechanisms and types used within contemporary cloud computing platforms are explored along with various key performance indicators and related metrics, Microservices of Cloud Computing.	15

Text Books, Reference Books and Others

Text Books Recommended:

- Distributed Computing by Dollymore Cloud Computing (Wind) by Dr. Kumar Saurabh, 2nd Edison, Wiley India.

Reference Books Recommended:

- Cloud Computing: Principles and Paradigms, Editors: Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Wile, 2011 Cloud Computing: Principles, Systems and Applications, Editors: Nikos Antonopoulos, Lee Gillam, Springer, 2012.
- Handbook of Cloud Computing by Anand Nayyar, Publisher: BPB Publication.

Online Resources:

- Introduction to Cloud Computing from W3shool:
  https://www.w3schools.in/cloud-computing/tutorials/
- Introduction to Cloud Computing from Coursera:
  https://www.coursera.org/learn/introduction-to-cloud
- Cloud Computing Basics:
  https://www.coursera.org/learn/cloud-computing-basics
- Cloud Computing Concepts:
  https://www.coursera.org/learn/cloud-computing
- Cloud Computing Specialization from Coursera:
  https://www.coursera.org/specializations/cloud-computing
- Cloud Computing from SWAYAM/NPTEL: https://onlinecourses.nptel.ac.in/noc22_cs20/preview
  https://www.youtube.com/channel/UCK73enkjfQNDwdBqMyaMtRg
- Cloud Computing Basics:
  https://terrorgum.com/tfox/books/cloudcomputingbasics_aselfteachingintroduction.pdf
- CLOUD COMPUTING Principles and Paradigms :
  https://dhoto.lecturer.pens.ac.id/lecture_notes/internet_of_things/CLOUD%20COMPUTING%20Principles%20and%20Paradigms.pdf
- Cloud Computing Tutorial For Beginners: https://www.youtube.com/watch?v=fLV_t2qKYyU
- Introduction to Cloud Computing: https://www.youtube.com/watch?v=Dv0sjAYnVCY
- Cloud Computing Tutorials: https://www.youtube.com/watch?v=NvA9PB6i8bg

GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)
FYUGP (CBCS/LOCF Course)
Department – Computer Science

Session: **2025-26**	Program: **B.Sc. (Maths)**
Semester: **VIII (Honors with Research Course)**	Subject: **Computer Science**
Course Type: **Major Project**	Course Code:
Course Title:	**Research Project / Dissertation**
Credit: **4**	Lecture: **60**
M.M. 100 =	**Minimum Passing Marks: 40%**

Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Enhance knowledge on latest techniques. • Make ready for IT industry. • Upgrade skill set as per IT industry. • Handle real word applications. • Debug Problem to make DFD of proposed system.	
Credit Value	4 Credits	Credit = 15 Hours - Learning & Observation
Total Marks	Max. Marks: 100	Min Passing Marks: 40

Content of the Course

Total No. of Teaching–Learning hours - 60 Hours

Important Guidelines for Project	No. of Period

A project report has to be submitted as per the rules described below:
 	
1. **Number of Copies:** The student should submit One hard bound copy of the Project Report with one CD/DVD.
2. **No of students:** Every student has to submit separate project.
3. **Acceptance / Rejection of Project Report:** The student must submit a project report to the Head of Department/Project Guide for approval. The Head of Department/Project Guide holds the right to accept the project or suggest modifications for resubmission.
4. **Format of the Project Report :**The student must adhere strictly to the following format for the submission of the Project Report
   I. **Paper:** The report shall be typed on white paper, A4 size or continuous computer stationary bond, for the final submission. The report to be submitted to the University must be original and subsequent copies may be photocopied on any paper.
   II. **Typing:** The typing shall be of standard letter size, double-spaced and on one side of the paper only, using black ribbons and black carbons.
   III. **Margins:** The typing must be done in the following margins
      Left ----- 35mm, Right ----- 20mm
      Top ----- 35mm, Bottom ----- 20mm
   IV. **Binding:** The Report shall be Rexene bound in black. Plastic, spiral bound Project Reports not be accepted.
   V. **Front Cover:** The front cover should contain the following details:
      TOP: The title in block capitals of 6mm to 15mm letters.
      CENTER: Full name in block capitals of 6mm to 10mm letters.
      BOTTOM: Name of the University, year of submission- all in block capitals of 6mm to 10mm letters on separate lines with proper spacing and centring.
	60

VI. **Blank Sheets:** At the beginning and end of the report, two white black bound papers should be provided, one for the purpose of binding and other to be left blank.

5. **Abstract:** Every report should have an abstract following the Institute's Certificate. The abstract shall guide the reader by highlighting the important material contained in the individual chapters, section, subsection etc.

6. **Certificates etc:** The report should contain the following:
   I. Institute Certificate: Successful completion of project by competent authority.
   II. Acknowledgment
   III. List of Figures
   IV. Tables
   V. Nomenclature and Abbreviations

7. **Contents of the Project Report:** The project report must contain following in form of chapter, however student may include any other relevant chapter(s):
   I. **Introduction to the project:** This chapter shall highlight the purpose of project work, it will also define the chapters to be followed in the Project Report.
   II. **Scope of work:** Brief scope of the project work done
   III. **Existing System and Need for proposed System:** If there is some system already in use, then give brief detail of it in order to help to understand the enhancements carried out by the student in the existing system.
   IV. **Operating Environment:** Hardware and Software required and used.
   V. **Proposed System:** Which may contain following:
      a. **Objectives to be fulfilled:** clearly define the objective(s) of the system.
      b. **User Requirements:** State the requirements of the use in an unambiguous manner.
      c. **Requirements Determination Techniques and Systems Analysis Methods Employed:** Use the formal methods to describe the requirements of the use like Fact Finding Methods, Decision Analysis, and Data Flow Analysis etc.
      d. **Prototyping:** If the prototypes has been developed prior to the detailed design, then give details of the prototype.
      e. **System Feature:** Which includes as follows:
      • Module specifications
         • D.F.D. and ER
         • System flow charts
         • Data Dictionary
         • Structure charts
         • Database /File layouts
         • Design of Input Design of Output screens and reports
         • User Interfaces
         • Design of Control Procedures

8. **Testing procedures and Implementation phase**
9. **Problems encountered, Drawbacks and Limitations**
10. **Proposed Enhancements/ Future enhancement**
11. **Conclusions**
12. **Bibliography**
13. **Annexure**

Text Books, Reference Books and Others

Text Books Recommended:

- Database system concept, H. Korth and A. Silberschatz, TMH Publications.
- Data Base Management System, Alexies & Mathews, Vikash publication.
- Roger S. Pressman, Software Engineering, A practitioner's Approach, 6th edition, McGraw Hill International Edition.

Reference Books Recommended:

- The Complete Reference, Kevin Loney, Oracle Press.
- SQL, PL/SQL the Programming Language of Oracle, Ivan Bayross, PustakKosh Publication.
- Microsoft SQL Server Management and Administration, Ross, STM Publications.
- James Rumbaugh, Ivar Jacobson, The unified modelling language user guide Grady Booch, Pearson Education.

Online Resources:

- SWAYAM URL link for DBMS and RDBMS: https://youtu.be/f6LGtJutWyA
- SWAYAM URL link for DBMS and RDBMS: https://swayam.gov.in/courses/4434-data-base-management-system
- Introduction of RDBMS from SWAYAM : https://onlinecourses.nptel.ac.in/noc19_cs46/preview
- Introduction to DMBS: https://www.w3schools.in/dbms/intro
- NPTEL YouTube Channel: Software Engineering Lectures by Prof Rajib Mall, IIT Kharagpur https://youtube.com/playlist?list=PLbRMhDVUMngf8oZR3DpKMvYhZKga90JVt&si=tTBITZUdivHpNz1H
- NPTEL YouTube Channel: Software Engineering Lecture Series https://youtube.com/playlist?list=PL8751DA481F0F0D17&si=07IfYV7GP8_oc1xZ