

FOUR YEAR UNDERGRADUATE PROGRAM (NEP-2020)

Program: Bachelor in Computer Application (2024 -28)

DISCIPLINE – COMPUTER APPLICATION

SESSION – 2024 -25

DSC -01 to 20		DSE -01 to 12	
Code	Title	Code	Title
CASC -01	Discrete Mathematics	CASE -01	Cyber Security and Cyber Law
CASC -02T	Computer Fundamental and MS-Office	CASE -02	Artificial Intelligence and Expert System
CASC -02P	Lab 1: MS-Office	CASE -03	Numerical Analysis
CASC -03T	Operating System	CASE -04	Computer System Architecture
CASC -03P	Lab 2: Operating System	CASE -05	Computer Graphics
CASC -04	Digital Electronics	CASE -06T	Cloud Computing
CASC -05T	Programming in C++	CASE -06P	Lab 13: Cloud Computing
CASC -05P	Lab 3: Programming in C++	CASE -07	Cryptography and Network Security
CASC -06T	Data Structure	CASE -08	Advanced Operating systems
CASC -06P	Lab 4: Data Structure Using C++	CASE -09	Soft Computing
CASC -07	Software Engineering	CASE -10	Digital Image Processing
CASC -08T	Relational Database Management System	CASE -11	Big Data Analytics
CASC -08P	Lab 5: Relational Database Management System (Oracle/MySQL)	CASE -12	Major Project-2
CASC -09T	Programming in Java		
CASC -09P	Lab 6: Programming in Java	DGE -01 & 02	
CASC -10	Theory of Computation	CAGE -01T	Computer Fundamental and MS-Office
CASC -11T	Web Technology	CAGE -01P	Lab 1: MS-Office
CASC -11P	Lab 7: Web Technology	CAGE -02T	Operating System
CASC -12T	Python Programming	CAGE -02P	Lab 2: Operating System
CASC -12P	Lab 8: Python Programming	VAC	
CASC -13	Data Mining and Data Warehousing	CAVAC-01	Artificial Intelligence
CASC -14T	Programming in .Net	SEC	
CASC -14P	Lab 9: Programming in .Net	CASEC-01	ICT Based Learning
CASC -15T	Machine Learning		
CASC -15P	Lab 10: Machine Learning		
CASC -16	Data Communication and Computer Networking		
CASC -17T	Advanced Java		
CASC -17P	Lab 11: Advanced Java		
CASC -18	Major Project-1		
CASC -19T	Mobile Application Development		

Dr. H.S. Hota (Chairman)
Dr. K.S. Dubey
Dr. SK Saha
Dr. Anamika Gupta
Dr. Anil Kumar Saha
Dr. Pratik Kumar
Dr. S.S. Saini
Dr. R. Khuntia
Dr. Anil Kumar
Dr. Anil Kumar
Dr. Anil Kumar

CASC -19P	Lab 12: Mobile Application Development		
CASC -20T	Fundamentals of IoT and Applications		
CASC -20P	Lab 14: Fundamentals of IoT and Applications		

Program Outcomes (PO):

- Gain a complete exposure to the theories and practices of Computer Application.
- Get transformed into a skilled learner and active programmer, enabling the students to focus on their higher studies.
- Value computer professionals and programmers.
- Explore how the concepts and applications of Computer lead to innovative thinking with a problem-solving attitude.

Program Specific Outcomes (PSO):

- Understand the basic computer knowledge and concept of operating systems.
- Understanding the concept of programming and develop program in C++.
- Understanding the concept of data structure and implementation with C/C++.
- Understanding the concept of DBMS and implementation in MySQL /Oracle.
- Understanding the concept of OOPs and Java programming and develop program in Java.
- Understanding the concept of web technology and its implementation with HTML/CSS/DHTML/PHP.
- Understand the basic concept of data and computer networks.
- Understanding the basic concept of digital electronics.
- Understanding the basic concept of cyber security and cyber law.
- Understanding the basic concept of Artificial Intelligence.

~~Dr. H.S. Hota~~
(Chairman)

~~Kiran~~
(Dr. K.B. Dubey)

~~Dr. S.K. Salu~~

~~Dr. J.K. Kumbhar~~

~~Annu~~
(Dr. Anil Sharma)

~~Dr. S. Jain~~
R. Khuntia

Sushil
(Sushil Kumar Sahu)

~~Anita~~
11/10/24
Dr. J.K. Kumbhar

~~Anu~~
(Dr. Anamika Shukla Ma)

~~Dr. S.~~
(Dr. S. Thakur)

~~Dr. S.~~
18-11-2024
Dr. S. Thakur

~~Dr. S.~~
(Shailendra Arora)

Anjeeta
ANJEETA KUMAR

~~H.S.P. Tonale~~
(H.S.P. Tonale)

	DSE	CASE-02	Artificial Intelligence and Expert System	4	100	40
5 th Semester	DSC (Major/Core)	CASC-13	Data Mining and Data Warehousing	4	100	40
		CASC-14T	Programming in .Net	3	100	40
		CASC-14P	Lab 9: Programming in .Net	1	50	20
		CASC-15T	Machine Learning	3	100	40
		CASC-15P	Lab 10: Machine Learning	1	50	20
	DSE	CASE-03	Numerical Analysis	4	100	40
6 th Semester	DSC (Major/Core)	CASC-16	Data Communication and Computer Networking	4	100	40
		CASC-17T	Advanced Java	3	50	20
		CASC-17P	Lab 11: Advanced Java	1	100	40
		CASC-18	Major Project-1	4	50	20
	DSE	CASE-04	Computer System Architecture	4	100	40
7 th Semester	DSC (Major/Core)	CASC-19T	Mobile Application Development	3	100	40
		CASC-19P	Lab 12: Mobile Application Development	1	50	20
	DSE	CASE-05	Computer Graphics	4	100	40
		CASE-06T	Cloud Computing	3	100	40
		CASE-06P	Lab 13: Cloud Computing	1	50	20
		CASE-07	Cryptography and Network Security	4	100	40
		CASE-08	Advanced Operating systems	4	100	40
8 th Semester	DSC (Major/Core)	CASC-20T	Fundamentals of IoT and Applications	3	100	40
		CASC-20P	Lab 14: Fundamentals of IoT and Applications	1	50	20
	DSE	CASE-09	Soft Computing	4	100	40
		CASE-10	Digital Image Processing	4	100	40
		CASE-11	Big Data Analytics	4	100	40
		CASE-12	Major Project - 2	4	100	40

Dr H.S. Hada
(Chairman)

Dr. K.B. Dubey

Dr. S.K. Saha

Dr. S.K. Saha

Dr. Anil Sharma

Dr. Anil Sharma

Dr. S. Datta

H.S.P. Tandi

Dr. Sushil Kumar Saha

Dr. Anand Kumar

Dr. Shailendra Arora

Dr. Anjeeta Kujur

Dr. Anamika Shukla Jha

Dr. Anamika Shukla Jha

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- B. A. Davey & H. A. Priestley (2002). Introduction to Lattices and Order (2nd edition). Cambridge University Press.
- Edgar G. Goodaire & Michael M. Parmenter (2018). Discrete Mathematics with Graph Theory (3rd edition). Pearson Education.

Reference Books Recommended:

- Rudolf Lidl & Günter Pilz (1998). Applied Abstract Algebra (2nd edition). Springer.
- Kenneth H. Rosen (2012). Discrete Mathematics and its Applications: With Combinatorics and Graph Theory (7th edition). McGraw-Hill.
- C. L. Liu (1985). Elements of Discrete Mathematics (2nd edition). McGraw-Hill.

Online Resources:

- SWAYAM Portal: Online Lectures on Discrete Mathematics
https://onlinecourses.swayam2.ac.in/cec20_ma02/preview
- NPTEL YouTube Channel: Online Lectures on Discrete Mathematics
https://youtube.com/playlist?list=PL0862D1A947252D20&si=saljtYdT4Z-_Js
- NPTEL YouTube Channel: Online Lectures on Discrete Mathematics
https://youtube.com/playlist?list=PLEAYkSg4uSQ2Wfc_14QEZUSRdx2ZcFziO&si=qf1UcKDC34RMWcCz

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 & 20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
Total Marks - 30		
End Semester Exam (ESE):	Two section - A & B Section A: Q1. Objective - 10 x 1 = 10 Mark; Q2. Short answer type- 5x4 = 20 Marks Section B: Descriptive answer type qts. out of 2 from each unit-4x10=40 Marks	

Name and Signature of Convener & Members of CBoS:

Dr. H. S. Hota (Chairman)
Dr. K. B. Dubey
Dr. S. K. Saha
Dr. Anil Sharma
Dr. Anamika Shukla Sharma
Dr. Ananta Kumar
Dr. H. S. P. Tripathi
Dr. R. Khuntia

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester - 1	Session: 2024-2025
1	Course Code	CASC-02T	
2	Course Title	Computer Fundamental and MS office	
3	Course Type	DSC (Discipline Specific Course)	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	After Completing this course, students will be able to: <ul style="list-style-type: none"> • Study and use of basic concepts and terminology of information technology. • Organize files and documents on storage devices. • Acquire knowledge of ICT and Internet applications. • Develop information technology solutions by evaluating user requirements in advance trends of IT. • Acquire knowledge of MS-Excel, MS-PowerPoint and MS-Access. 	
6	Credit Value	3 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART -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 to Computer: History of computer, Generations and Classification, Basic Anatomy of Computer: Block Diagram, Central Processing Unit (CPU): Function of each Unit, Memory: Primary, Cache, Flash, Software and its needs, Types of S/W: System Software and Application Software, Types of Programming Language: Machine Language, Assembly Language, High Level Language their advantages and disadvantages, Language Processors/Translators: Assembler, Interpreter and Compiler, Fundamental of Information Technology: Data and Information, Concept of IT, Application of IT, What is ICT?, Components of ICT, Impact of ICT in Society. Advanced Trends in IT: Cloud Technology, Virtual LAN Technology, M-Commerce, Nanotechnology, Virtual Reality, 3-D Printing, Internet of Things (IoT), Artificial Intelligence (AI), Machine Learning (ML), Cloud Computing, Quantum Computing, G-Suite, GoI digital initiatives in higher education: SWAYAM, Swayam Prabha, National Academic Depository, National Digital Library of India, E-Sodh-Sindhu, Virtual labs, e-Yantra and NPTEL.	12
II	MS-Word: Introduction to word processing software and its features, Creating new document, Saving documents, Opening and Printing documents. Home Tab: Setting fonts, Paragraph settings, Various styles (Normal, No spacing, Heading1, Heading2, Title, Strong), Find & Replace, Format painter, Copy paste and paste special. Insert Tab: Pages, Tables, Pictures, Clipart, Shapes, Header & Footer, Word Art, Equation and Symbols. Page Layout Tab: Page setup, Page Background, Paragraph (indent and spacing). Mailing Tab: Create Envelops and Labels, Mail Merge. Review Tab: Spelling and Grammar check, New comment, Protect document, View Tab: Document views, Zoom, Window (New window, Split, Switch window).	11
III	MS-Excel: Introducing Excel, Use of Excel sheet, creating new sheet, Saving, Opening, and Printing workbook. Home Tab: Font, Alignment, Number, Styles and cells and editing, Conditional Formatting. Insert Tab: Table, Charts (column chart, Pie chart, Bar chart, Line chart) and Texts (header & footer, word art, signature line). Page Layout Tab:	11

Dr. H.S. Fokea (Chairman) *Dr. K.G. Dubey* *Dr. S.K. Sah* *Dr. Anil Kumar* *Dr. Anshika Shukla*
Dr. Anshika Shukla *Dr. Anshika Shukla* *Dr. Anshika Shukla* *Dr. Anshika Shukla*

	Page setup options, Scale to fit (width, height, scale). Formulas Tab: Auto sum (sum, average, min, max), Logical (IF, and, or, not, true, false), Math & Trig (sin, cos, tan, ceiling, floor, fact, mod, log), Sort and Filter options, Data validation, Group and ungroup. Review Tab: Protect sheet, Protect workbook, and Share workbook. View Tab: Page breaks, Page layout, Freezing Panes, Split and hide.	
IV	<p>Working with PowerPoint and MS-Access</p> <p>PowerPoint: Introducing PowerPoint, Use of PowerPoint presentation, Creating new slides saving, Opening and printing. Home Tab: New slide, Layout, Reset, Delete, Setting text direction, Align text, Convert to smart art, Drawing options. Insert Tab: Table, Picture, Clipart, Photo album, Smart art, Shapes and chart, Movie and sound, Hyperlink and action, Text box, Word art, Object. Design Tab: Page setup options, Slide orientation, Applying various themes, Selecting background style and formatting it. Animations Tab: Custom animation for entrance, Exit and emphasis, Applying slide transition, Setting transition speed and sound, Animation on rehearse timing. Slideshow & View Tab: Start slide, Show options, and Setup options. View tab: Presentation views, Colors and Window option.</p> <p>MS-Access: Introduction to DBMS, features of DBMS, creating blank databases, Saving it in accdb format, Defining data type in MS Access, Creating tables, creating reports, query wizard.</p>	11
Keywords	Information Technology (IT), Information and Communication Technology (ICT), G-Suite, MS Word, MS Excel, MS Power Point, MS-Access.	
Name and Signature of Convener & Members of CBAs:		

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Computer Fundamentals, P.K. Sinha, BPB Publication, Sixth Edition.
- Fundamentals of Information Technology, Chetan Shrivastava, Kalyan Publishers.
- Fundamentals of Computers, V. Rajaraman, PHI Sixth Edition.
- Computer Fundamentals and Office Automation, Dr. Santosh Kumar Miri, Iterative International Publisher IIP.
- Computer Fundamentals Architecture and Organization, B. Ram, New Age International Publishers, Fifth Edition.
- Fundamentals of Information Technology, Alexis Leon and Mathews Leon, Vikash Publication.

Reference Books Recommended:

- Introduction to Information Technology, V. Rajaraman, PHI publication.
- Fundamental of IT, Leon and Leon, Leon Tec world.
- Introduction to Information Technology, Aksoy and Denardis, Cengage learning.
- Computers Today, Suresh K. Basandra, Galgotia Publications.
- Information Technology – The breaking wave, Dennis P.Curtin, Kim Foley, Kunai Sen and Cathleen Morin, TMH.
- OFFICE 2013 in Simple Steps, Kogent Solution Inc., DremTech Press.
- Access 2010 in Simple Steps by Kogent Learning Solutions Inc.

A.H.S. Hota
Chairman

(Dr. K. B. Dabey)

(Dr. S.K. Sahay)

(Suresh K. Basandra)

(Dr. S. Jais)

(Dr. S. Jais)

(Dr. S. Jais)

JMD
Lund

Online Resources:

- Introduction to Computer Fundamental from W3school:
<https://www.w3schools.blog/computer-fundamentals-tutorial>
- Introduction to MS-Word from W3school:
<https://www.w3schools.blog/ms-word-tutorial>
- Introduction to MS-Excel from W3school:
https://www.w3schools.com/excel/excel_introduction.php
- Introduction to MS-PowerPoint from W3school:
<https://www.w3schools.blog/powerpoint-tutorial>
- Introduction to MS-Access from W3school:
https://www.w3schools.com/sql/sql_ref_msaccess.asp
- Fundamentals of Computers & Information Technology (in Hindi) :
<https://www.mcu.ac.in/wp-content/uploads/2020/04/1PGDCA1-Unit-I-Fundamentals-of-Computers-Information-Technology.pdf>
- Fundamentals of Computers & Information Technology (in Hindi):
https://hte.rajasthan.gov.in/dept/dte/board_of_technical_education,rajasthan/government_polytechnic_college_hanumangarh/uploads/doc/fundamental-final-rkd.pdf
- Information and Computers Technology: https://cbseacademic.nic.in/web_material/doc/2014/11 ICT-IX.pdf.pdf
- Microsoft Office (in Hindi):
<https://www.scribd.com/document/534988849/9-Microsoft-office-in-hindi-www-GkNotesPDF-com>
- MS-OFFICE:
<https://www.rgyesm.org/uploads/books/MICROSOFT-OFFICE-BOOK.pdf>
- MS-OFFICE:
Hindi Notes: <https://www.copaguide.com/2020/04/ms-office-topics.html>
- Microsoft Office Full Crash Course:
<https://www.youtube.com/watch?v=SH4oyV5AJ6A>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

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End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 & 20	Better marks out of the two Test / Quiz obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
	Total Marks - 30	

End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1 = 10 Mark; Q2. Short answer type- 5x4 = 20 Marks Section B: Descriptive answer type qts..1 out of 2 from each unit-4x10 = 40 Marks
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Name and Signature of Convener & Members of CBoS:

Dr. H. S. Moha
Chairman

(Dr. K. B. Dubey)

(Sushil Kumar Baku)

(Suresh Thakkar)

(Dr. K. S. Sale)

(Shankar Aggarwal)

(Dr. Anil Sharma)

(Dr. Anamika Shukla Sharma)

(Dr. R. Khuntia)

(H. S. P. Tondle)

ANJELIA Kujur

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction

Program: Bachelor of Computer Application (Certificate / Diploma / Degree)		Semester - 1	Session: 2024-2025
1	Course Code	CASC-02P	
2	Course Title	Lab 1: MS-Office	
3	Course Type	Practical	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	After Completing this course, students will be able to: <ul style="list-style-type: none"> Gain Practical knowledge of MS-Office. Organize files and documents on storage devices. Acquire knowledge of ICT and Internet applications. Develop information technology solutions by evaluating user requirements in advance trends of IT. Acquire knowledge of MS-Excel, MS-PowerPoint and MS-Access. 	
6	Credit Value	1 Credits	Credit =30 Hours Laboratory or Field Learning/Training
7	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)

List of Experiments	No. of Period
<p>Application of Information Technology</p> <ol style="list-style-type: none"> How to create mail in a Gmail account? Write the uses of Inbox, Sent, Outbox, Draft, Spam and Trash labels. How to design Google form? Write the steps with appropriate windows. How to create different student classes in Google classroom. How do teachers create assignments and provide due dates, or grades in Google Classroom? How do students find assignments, due dates, or grades in Google Classroom? How to use social media platforms like twitter, Facebook and YouTube? How to use social media platforms like Flickr, Skype, yahoo and WhatsApp? How to use Google spreadsheets, Google Slides and Google forms? How to share files between mobile phone and computer system/Laptop using Bluetooth. 	30
<p>MS-Word</p> <ol style="list-style-type: none"> Prepare a grocery list having four columns (Serial number, the name of the product, quantity and price) for the month of April, 06. <ul style="list-style-type: none"> Font specific actions for Title (Grocery List): 14-point Arial font in bold and italics. The headings of the columns should be in 12-point and bold. The rest of the document should be in 10-point Times New Roman. 	

A.H.S. Hota (Chairman) *[Signature]*
 Dr. K.G. Duhay *[Signature]*
 (Bachil Kumar Sahu) *[Signature]*
 Dr. S.K. Saha *[Signature]*
 Dr. Anil Kumar *[Signature]*
 (Sudhanshu Singh) *[Signature]*
 Dr. Anil Kumar *[Signature]*
 (Dr. S. Jha) *[Signature]*
 Anjeeta Kumar *[Signature]*
 R. Khaitan *[Signature]*
 (Dr. Anil Kumar) *[Signature]*
 (Dr. Anil Kumar) *[Signature]*

d. Calculate Amount=Rate*Total.

2. Given the following worksheet

	A	B	C	D
1	Roll No.	Name	Marks	Grade
2	1001	Sachin	99	
3	1002	Shwag	65	
4	1003	Rahul	41	
5	1004	Sourav	89	
6	1005	Harbhajan	56	

Calculate the grade of these students on the basis of following guidelines:

If Marks	Then Grade
≥ 80	A+
≥ 60 and < 80	A
≥ 50 and < 60	B
< 50	F

3. Given the following worksheet

	A	B	C	D	E	F	G
1	Salesman	Sales in(Rs.)					
2	No.	Qtr1	Qtr2	Qtr3	Qtr4	Total	Commission
3	S001	5000	8500	12000	9000		
4	S002	7000	4000	7500	11000		
5	S003	4000	9000	6500	8200		
6	S004	5500	6900	4500	10500		
7	S005	7400	8500	9200	8300		
8	S006	5300	7600	9800	6100		

Calculate the commission earned by the salesman on the basis of following Candidates:

If Total Sales	Then Commission
< 20000	0% of sales
> 20000 and < 25000	4% of sales
> 25000 and < 30000	5.5% of sales
> 30000 and < 35000	8% of sales
≥ 35000	11% of sales

The total sales are the sum of sales of all the four quarters.

4. Company XYZ Ltd. pays a monthly salary to its employees who consist of basic salary, allowances & deductions. The details of allowances and deductions are as follows:

- HRA Dependent on Basic
 - 30% of Basic if Basic ≤ 1000
 - 25% of Basic if Basic > 1000 & Basic ≤ 3000
 - 20% of Basic if Basic > 3000
- DA Fixed for all employees, 30% of Basic
- Conveyance Allowance (CA)

Dr. H.S. Moha
 Chairman
 Dr. K.B. Dabey
 Dr. S.K. Sahu
 Dr. G. Thakur
 Dr. Anil Sharma
 Dr. R. Khutley
 Dr. A.S. Sharma
 ANJETA
 Dr. S. Jain
 Dr. A.S. Sharma
 Dr. K. Khutley
 Dr. A.S. Sharma

>> If total sales > 4, 00,000 give 5% commission on total sale made by the salesman.

>> Otherwise give 2% commission.

- Draw a bar graph representing the sale made by each salesman.
- Draw a pie graph representing the sale made by a salesman in 2000.

8. Enter the following data in Excel Sheet

PERSONAL BUDGET FOR FIRST QUARTER

Monthly Income(Net): 1,475

EXPENSES	JAN	FEB	MARCH QUARTER TOTAL	QUARTER AVERAGE
Rent	600.00	600.00	600.00	
Telephone	48.25	43.50	60.00	
Utilities	67.27	110.00	70.00	
Credit Card	200.00	110.00	70.00	
Oil	100.00	150.00	90.00	
AV to Insurance	150.00			
Cable TV	40.75	40.75	40.75	
Monthly Total				

- Calculate Quarter total and Quarter average.
- Calculate Monthly total.
- Surplus=Monthly income-Monthly total.
- What would be the total surplus if monthly income is 1500.
- How much does the telephone expense for March differ from quarter average?
- Create a 3D column graph for telephone and utilities.
- Create a pie chart for monthly expenses.

9. Enter the following data in Excel Sheet

TOTAL REVENUE EARNED FOR SAM'S BOOK STALL

Publisher Name	1997	1998	1999	2000	Total
A	Rs. 1,000.00	Rs. 1100.00	Rs. 1,300.00	Rs. 800.00	
B	Rs. 1,500.00	Rs. 700.00	Rs. 1,000.00	Rs. 2,000.00	
C	Rs. 700.00	Rs. 900.00	Rs. 1,500.00	Rs. 600.00	
D	Rs. 1,200.00	Rs. 500.00	Rs. 200.00	Rs. 1,100.00	

- Compute the total revenue earned.
 - Plot the line chart to compare the revenue of all publishers for 4 years.
 - Chart Title should be Total Revenue of Sam's Book stall(1997-2000)
 - Give appropriate categories and value axis title.
10. Generate 25 random numbers between 0 & 100 and find their sum, average and count. How many no. are in the range 50-60.

MS-Power Point

1. Do the following task:

- Start a new blank presentation
- Your first Slide is going to be a Title Slide
- Write the Text as in the preview below:

Dr. H. S. Bhatnagar
Chairman
Dr. K. A. Dubey
Sushil Kumar Sahu
Dr. S. K. Saha
Dr. S. J. Sin
R. Khuntia
Dr. S. Sharma
Dr. S. Sharma

- o Lighthouse Co Ltd
- o Make the Font of "Lighthouse" Arial Black and size 88
- Insert a second slide this should be with a layout of Bulleted List
- Write the Text as in preview below
- [Title]: Lighthouse Co Ltd
- [Body]:
 - i. Mission Statement
 - ii. Company Objectives
 - iii. Management Team
 - iv. Employees
 - v. Sales

Make the Font Color of the Points to Green

Insert a third slide that should be an Organization Chart.

Include the following people in the chart:

- a. David Brent, General Manager
- b. Tim Canterbury, Head of Sales
- c. Gareth Keenan, Assistant to the General Manager
- d. Dawn Tinsley, Human Resources Manager

Add a fourth slide and this should be a Table Chart.

The chart should look like the following:

New Products	Discontinued Products
Digital Cameras	8mm Cameras
Ultra Slim Video Camera	8x Zoom Video Camera
25" Plasma TVs21"	Black and White TVs
DVD Recorders	Video Players
7.1 Dolby Surround Systems	2 channel stereo systems

- o Make the titles New Products and Discontinued Products with a shadow effect and centered in the cell. Widen columns to fit Text as above.
- The Fifth slide should be a Chart slide. The chart should be a bar chart, and include the following data must be used to form the chart:

	January	February	March	April
TVs	20	27	90	75
DVDs	30	38	34	31
Wifi equipment	45	46	45	43
Video Recorders	25	29	15	40

- Change the colours of the chart so that the series of bars are red, yellow, pink, and green.
 - Add a light coloured background to all slides in the presentation.
 - Add also Transition effects between each slide and also different effects for all text and pictures in the presentation.
 - Reverse the order of the second and third slides
 - Save the presentation as Light House Ltd.
2. Do the following:
- Load your Presentation Application and start a new presentation
 - The first slide is a Title Slide. Select the appropriate layout and enter the title: **Annual Food Fair**
 - Add the subtitle: **A Celebration of Eating**
 - Insert a small, red circle at the bottom right of the title slide.

Dr. H.S. Moha
Chairman

Kiran
(Dr. K.B. Dubey)

Dr. S.K. Saly

(Saroj K. Saly)

Durgin
Kotariya

Arms
(Dr. Anil Sharma)

(Dr. Anil Jain)

R. Khuntia

Jankit
(Sankit Kumar Saha)

Shankar Prasad

Subir Kumar

ANJETA
M.U.D.A.

AS. Sharma

5. Creating an animation looks like demolishing a world trade center in America.

MS-Access

1. Create a database named "college" and perform the following tasks:
 - A. Create a table named "student" having following fields:
Class, Roll no and Name with these Information i.e., Field Name, Data type and Description
 - B. Fill at least 5 records.
 - C. Prepare a query to display all records and Name should be in ascending order.
2. Create the employee table in MS-Access with the referential integrity-foreign key.

Note: This is a tentative list; the teachers' concern can add more program as per requirement.

Keywords: Information Technology (IT), Information and Communication Technology (ICT), G-Suite, MS Word, MS Excel, MS Power Point, MS-Access.

Name and Signature of Convener & Members of CBoS:

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Computer Fundamentals, P.K. Sinha, BPB Publication, Sixth Edition.
- Fundamentals of Information Technology, Chetan Shrivastava, Kalyan Publishers.
- Fundamentals of Computers, V. Rajaraman, PHI Sixth Edition.
- Computer Fundamentals and Office Automation, Dr. Santosh Kumar Miri, Iterative International Publisher IIP.
- Computer Fundamentals Architecture and Organization, B. Ram, New Age International Publishers, Fifth Edition.
- Fundamentals of Information Technology, Alexis Leon and Mathews Leon, Vikash Publication.

Reference Books Recommended:

- Introduction to Information Technology, V. Rajaraman, PHI publication.
- Fundamental of IT, Leon and Leon, Leon Tec world.
- Introduction to Information Technology, Aksoy and Denardis, Cengage learning.
- Computers Today, Suresh K. Basandra, Galgotia Publications.
- Information Technology – The breaking wave, Dennis P.Curtin, Kim Foley, Kunai Sen and Cathleen Morin, TMH.
- OFFICE 2013 in Simple Steps, Kogent Solution Inc., DremTech Press.
- Access 2010 in Simple Steps by Kogent Learning Solutions Inc.

Online Resources:

- Introduction to Computer Fundamental from W3school:
<https://www.w3schools.blog/computer-fundamentals-tutorial>
- Introduction to MS-Word from W3school:

Dr. H.S. Hahar
Chairman
Sushil
(Sushil Kumar Sahas)Kishor
(Dr. K.B. Dubey)
Sah
(Dr. S.K. Sah)Saroj Thakur
Dnyanesh
Rohit
Anshu
(Dr. Anshu Sharma)
Anshu
ANJETA KOSAR
Braj
(Dr. S. Jaiswal)
R. Khudoley
ASAS
(ASAS)Saur
Jyoti
Laxmi
Case

- <https://www.w3schools.blog/ms-word-tutorial>
- Introduction to MS-Excel from W3school:
https://www.w3schools.com/excel/excel_introduction.php
- Introduction to MS-PowerPoint from W3school:
<https://www.w3schools.blog/powerpoint-tutorial>
- Introduction to MS-Access from W3school:
https://www.w3schools.com/sql/sql_ref_msaccess.asp
- Fundamentals of Computers & Information Technology (in Hindi) :
<https://www.mcu.ac.in/wp-content/uploads/2020/04/IPGDCAI-Unit-I-Fundamentals-of-Computers-Information-Technology.pdf>
- Fundamentals of Computers & Information Technology (in Hindi):
https://hte.rajasthan.gov.in/dept/dte/board_of_technical_education_rajasthan/government_polytechnic_college_hanunagarh/uploads/doc/fundamental-final-rkd.pdf
- Information and Computers Technology: https://cbseacademic.nic.in/web_material/doc/2014/11 ICT-IX.pdf.pdf
- Microsoft Office (in Hindi):
<https://www.scribd.com/document/534988849/9-Microsoft-office-in-hindi-www-GkNotesPDF-com>
- MS-OFFICE:
<https://www.rgycsm.org/uploads/books/MICROSOFT-OFFICE-BOOK.pdf>
- MS-OFFICE:
Hindi Notes: <https://www.eopaguide.com/2020/04/ms-office-topics.html>
- Microsoft Office Full Crash Course:
<https://www.youtube.com/watch?v=SH4oyV5AJ6A>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks:	50 Marks
Continuous Internal Assessment (CIA):	15 Marks
End Semester Exam (ESE):	35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2):	10 & 10	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks.
	Assignment/Seminar + Attendance -	05	
Total Marks -		15	
End Semester Exam (ESE):	Laboratory / Field Skill Performance:		Managed by Course teacher as per lab. status
	On spot Assessment		
	A. Performed the Task based on lab. work	- 20 Marks	
	B. Spotting based on tools & technology (written) -	10 Marks	
Viva-voce (based on principle/technology)		- 05 Marks	

Name and Signature of Convener & Members of CBoS:

Dr. H. S. Hora
 Chairman
 (Ork. B. Dubey)
 (Suresh Thakkar)
 (Dr. Anil Sharma)
 (Dr. AS. Sharma)
 ANJEETA Kujur
 (Dr. S. Jain)
 R. Khurana
 (Dr. Anil Sharma)
 (Dr. AS. Sharma)

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Peter Baer Galvin, Greg Gagne, Operating System Concepts – Abraham Silberschatz, 8th edition, Wiley-India, 2009.
- Andrew S. Tanenbaum, Modern Operating Systems, 3rd Edition, PHI
- Elmasri, Carrick, Levine, Operating Systems: A Spiral Approach – TMH Edition

Reference Books Recommended:

- Akshay Singh, Operating System, RGCSM Publications
- Russell A Stultz, MS DOS 6.22, BPB Publications
- Brain Underdahl, Teach yourself Windows 2000, Wiley Publications.
- Peter Norton, Maximizing Windows, Teachmedia.
- Ray Duncan, Advances MS-DOS Programming, BPB
- Ray Yao, Shell Scripting in 8 Hours

Online Resources:

- Fundamentals of Computer, Windows Operating System: <https://vikaspedia.in/education/digital-literacy/it-literacy-courses-in-associating-with-msup/computer-fundamentals>
- Introduction to Operating System: <https://www.w3schools.in/operating-system/tutorials/>
- Introduction to Operating System: <https://www.javatpoint.com/windows>
- Windows : <https://www.javatpoint.com/windows>
- Linux: <https://www.javatpoint.com/what-is-linux>
- DOS: <https://www.geeksforgeeks.org/ms-dos-operating-system/>
- DOS : <https://www.javatpoint.com/ms-dos-operating-system>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2):	20 & 20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar -	10	
	Total Marks -	30	
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit-4x10=40 Marks		

Name and Signature of Convener & Members of CRoS:

Dr. His Kato
Chairman

Dr. K. B. Desai
(Dr. K. B. Desai)

Sushil Kumar
(Sushil Kumar)

Dr. S. Jain
(Dr. S. Jain)

R. Khuntia
(R. Khuntia)

Dr. Anil Sharma
(Dr. Anil Sharma)

Dr. A. S. Sharma
(Dr. A. S. Sharma)

Anjeeta Kujur
(Anjeeta Kujur)

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application <i>(Certificate / Diploma / Degree)</i>		Semester - I	Session: 2024-2025
1	Course Code	CASC-03P	
2	Course Title	Lab 2: Operating System	
3	Course Type	Practical	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the fundamental concepts of DOS, Windows and Linux Operating System. • Understand basics of DOS commands and its types. • Understand features of Windows Operating system. • Understand comparative features of DOS and Windows Operating systems. • Explore functionality of Linux. 	
6	Credit Value	1 Credits	<i>Credit =30 Hours Laboratory or Field Learning/Training</i>
7	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 Experiment	<ol style="list-style-type: none"> 1. Demonstrate different Directory naming listing structure with all options. 2. Create one file and rename file using DOS command 3. Demonstrate all Internal DOS Commands with Output. 4. Demonstrate all external DOS Commands with output. 5. Introduction to Windows and Familiarity with its controls. 6. Study and use of Desktop, my computer, recycle bin, Task bar. 7. Working with Files and Folder. 8. Use of various window applications: Calculator, notepad and MS-Paint. 9. Explaining control panel options. 10. Working with printers. 11. Create a file using Linux command. 12. Write a Linux command which lists all files and directories. 13. Demonstrate use of grep command. 14. Create Directory using Linux command and create 3 different files in this directory. 15. Delete above created files and directory using Linux command. 16. Explaining various flavors of Linux. <p>Note: Concerned teacher can add additional experiment as per requirement.</p>	30

Keywords DOS, Windows, Linux.

Name and Signature of Convener & Members of CBoS:

Dr. H. S. Hota (Chairman) *Dr. K. B. Dubey* *Dr. S. K. Sah* *Dr. Anil Kumar* *Dr. S. Jain* *Dr. K. Khuntia*
Sushil Kumar Sahu *(Suresh Kumar)* *(Anjeeta Kujur)* *(Dr. A. S. Jena)*
(Swalinda Ags)

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Russel A Stultz, MS DOS 6.22 BPB Publications
- Brain Underdahl, Teach yourself Windows 2000, Wiley Publications.

Reference Books Recommended:

- Peter Norton, Maximizing Windows, Teachmedia.
- Ray Duncan, Advances MS-DOS Programming, BPB
- Akshay Singh, Operating System, RGCSM Publications
- Ray Yao, Shell Scripting in 8 Hours

Online Resources:

- DOS: <https://www.javatpoint.com/ms-dos-operating-system>
- Windows: <https://www.javatpoint.com/windows>
- Linux: <https://www.javatpoint.com/what-is-linux>
- Fundamentals of Computer, Windows Operating System:
<https://vikaspedia.in/education/digital-literacy/it-literacy-courses-in-associating-with-msup/computer-fundamentals>
- DOS: <https://www.geeksforgeeks.org/ms-dos-operating-system/>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) - 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota (Chairman) 
Dr. K.B. Dubey 
Dr. S.K. Sahu 
Dr. Anand Sharma 
Dr. R. Khuntia 
Dr. P.S. Sharma 
Sushil Kumar Sahu 
Anurash Thakur 
Dr. Anand Sharma 
Anjeeta Kujur 
Shobinder Agn 
Sun 

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester -II	Session: 2024-2025
1	Course Code	CASC-04	
2	Course Title	Digital Electronics	
3	Course Type	DSC (Discipline Specific Course)	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able: <ul style="list-style-type: none"> • To understand the fundamental concepts and techniques used in digital electronics. • Understand how the computer system identifies the data inside. • To understand and examine the structure of various number systems and its application in digital design. • To Perform basic arithmetic calculations in binary, decimal and hexadecimal; • The ability to understand, analyze and design various combinational and sequential circuits. • To identify the basic requirements according to the specification for a newly customized digital circuit and design it in a cost effective manner. 	
6	Credit Value	4 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART -B: 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	NUMBER SYSTEM AND DATA REPRESENTATION :Introduction of number system (binary, decimal, octal, hexadecimal etc.), inter-conversion between the number systems, arithmetic operations, complements in the number system, representation of numeric data(binary representation of integers, fixed point and floating point data representation),codes and its classification(weighted code and its types like NBCD etc. , non-weighted code like (Excess-3 code Gray code etc.) , alphanumeric code like (ASCII, UNICODE, EBCDIC etc.), Error detecting code like (parity bit coding technique, etc.),Error correcting codes like (hamming code etc.)		15
II	BOOLEAN ALGEBRA : Boolean algebra and basic operations, sum of product, product of sum, simplification of Boolean expression using simplification techniques: Boolean laws and K-Map. FUNDAMENTALS OF DIGITAL CIRCUIT DESIGN : Digital logic families and its properties, Logic gate and its types, Construction of basic digital circuits using fundamental gates as well as Universal gates, simplification of digital circuit. Types of digital circuits (combinational circuit, sequential circuits).		15
III	COMBINATIONAL CIRCUIT : Adder (half adder, full adder, N bit adder), Subtractor (half subtractor, full subtractor, N bit subtractor), Decoder, Encoder, Multiplexer, De-multiplexer, Comparator, Code Convertor SEQUENTIAL CIRCUIT : Multivibrators/Latch, Flip- flop and its types (S R flip flop, D Flip Flop, J K Flip Flop, T Flip Flop, Master Slave Flip Flop), Register and its types, Counters and its types.		15
IV	MICROPROCESSORS : Introduction of microprocessor, evolution of microprocessor, basic components in microprocessor, basic microprocessor instruction, addressing modes, designing of eight-bit microprocessor (8085 microprocessor). designing of 16-bit microprocessor (8086 microprocessor).		15

Dr. H.S. Hota
 Chairman
 Dr. K.B. Dubey
 Dr. S. Jain
 Dr. Anil Sharma
 Dr. S. Thakur
 R. Khurshid
 Dr. S. S. S.

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester - II	Session: 2024-2025
1	Course Code	CASC-05T	
2	Course Title	Programming in C++	
3	Course Type	DSC (Discipline Specific Course)	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the fundamentals of object oriented programming. • Write programs related to concept of object oriented program • Define functions, class and to create own Libraries. • Write programs for file handling. • Develop small programs to solve real world problems. 	
6	Credit Value	3 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART -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 and Programming Concepts : Definition of Program, Source file, Object file, Executable file, Header file, Language Translator- Assembler, Interpreter, Compiler, Testing, Debugging, Linker and Loader, Algorithms, Flow Charts, History of C language, Structure of C program , C Tokens : Identifiers, Keywords, Constants, Variables, Operators, Data Types, Control structure: Conditional and looping statements, Operator Precedence and Associativity, Array and its types, Pointer, Functions : Standard Library and User defined functions, function prototype, Call by value and Call by reference, recursive functions, String functions.	12
II	Introduction to Object Oriented Programming: Concept of object oriented programming, Features of C++, Structure of C++ program, Data types, structure, class and objects, Access Specifiers: Private, Public, Protected, inline functions, static data and static functions. Constructor: Default constructor, Copy constructor, Parameterized constructor, Destructor.	11
III	Inheritance and Polymorphism: Definition, Concept of base and derived class. Types of Inheritance: Single, Multilevel, Multiple. Hierarchical and Hybrid Inheritance. Polymorphism: Definition, Compile time polymorphism: Function overloading, Operator overloading, constructor overloading, Runtime polymorphism: Virtual Function, pure virtual function. Inline function, friend function, friend class.	11
IV	Input-Output and File Handling : I/O classes, File and Stream classes, Char I/O, String I/O, Object I/O, File Pointer, Opening and Closing file. Exception Handling and Standard Template Library: Definition, Exception basics, try, catch and throws keywords, Template.	11
Keywords	Token, Identifier, Keyword, Array, Function, Class, Object, Polymorphism, Inheritance, Constructor, Template.	

Name and Signature of Convener & Members of CBAs:

Dr. H.S. Hero (Chairman) *Chini*
 (Dr. K.B. Dubey) *(Dr. K.B. Dubey)*
 (Sushil Kumar Sahu) *(Sushil Kumar Sahu)*
 (Gourav Thakur) *(Gourav Thakur)*
 (Dr. Anil Sharma) *(Dr. Anil Sharma)*
 (Dr. S. Jain) *(Dr. S. Jain)*
 (R. K. Shrivastava) *(R. K. Shrivastava)*
 (Dr. A.S. Sharma) *(Dr. A.S. Sharma)*
 ANJETA KUMAR *ANJETA KUMAR*

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Peter Juliff, Program Design, PHI Publications.
- Yashwant Kanetkar, Let us C: BPB Publications.
- E. Balaguruswamy, Programming in ANSI C, Tata McGraw Hill

Reference Books Recommended:

- Y. Kanetkar, Let us C++, B.P.B Publication .
- E. Balaguruswamy, Programming in C++, Tata McGraw Hill.
- R. Kumar, Object Oriented Programming with C++, Prakhar Publication(Hindi)
- Dhupiya, Lakhyani , C++ Programming Alka Publications, Ajmer (Paperback, Dhupiya, Lakhyani)(Hindi)

Online Resources:

- Introduction to C and C++ from SWAYAM/NPTEL
https://onlinecourses.nptel.ac.in/noc22_cs103/preview
<https://www.youtube.com/watch?v=KG4hjVDw-p8&list=PLmp4yIk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=2>
- Constant and Inline Function through NPTEL:
<https://www.youtube.com/watch?v=pX6LufLso2M&list=PLmp4yIk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=10>
- Pointer and Reference NPTEL
<https://www.youtube.com/watch?v=GtsBZ5e1-cE&list=PLmp4yIk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=12>
- Function Overloading NPTEL
<https://www.youtube.com/watch?v=uJGmGAShHeU&list=PLmp4yIk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=13>
- Operator Overloading NPTEL
<https://www.youtube.com/watch?v=0jpOwe4d-FE&list=PLmp4yIk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=17>
- Dynamic Memory Management NPTEL
<https://www.youtube.com/watch?v=IkFK2X6qIc0&list=PLmp4yIk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=18>
- Class and Object NPTEL
https://www.youtube.com/watch?v=wtuks_f3vP4&list=PLmp4yIk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=24
- Access Specifiers NPTEL
https://www.youtube.com/watch?v=6ki_w7cXdM0&list=PLmp4yIk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=22
- Constructor and Destructor NPTEL
https://www.youtube.com/watch?v=wtuks_f3vP4&list=PLmp4yIk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=24
- C++ different topics from W3School
<https://www.w3schools.com/Cpp/default.asp>
- C++ different topics from Javatpoint
<https://www.javatpoint.com/cpp-tutorial>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
	Total Marks - 30	

End Semester Exam (ESE): Two section - A & B
 Section A: Q1. Objective - 10 x1= 10 Mark; Q2. Short answer type- 5x4 = 20 Marks
 Section B: Descriptive answer type qts. 1 out of 2 from each unit-4x10=40 Marks

Name and Signature of Convener & Members of CBoS:

~~Dr. H.S. Hota~~ *Krish*
 Chairman (Dr. B. Dubey) *(Dr. S.K. Sahu)* *Jitendra* *Dr. Anil Sharma* *Dr. S. Saini* *R. Khuntia*
Sunil *(Suresh Thakur)* *Shailendra* *Anjita* *ANJEETA KUMAR*
(Sushil Kumar Sahu) *(Anurag Kumar)* *(Dr. Anil Sharma)* *(Dr. S. Saini)*
Dr. S. Saini *Anjita* *ANJEETA KUMAR*

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction		
Program: Bachelor in Computer Application (Certificate / Diploma / Degree)		Semester - II
		Session: 2024-2025
1	Course Code	CASC-05P
2	Course Title	Lab 3: Programming in C++
3	Course Type	Practical
4	Prerequisite	As per program
5	Course Learning Outcomes (CLO)	<p>At the end of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Understand the fundamental programming concepts and methodologies which are essential to create good C++ programs. • Code, test, and implement a well-structured, robust computer program using the C++ programming language. • Write reusable modules (collections of functions). • Understand design/implementation issues involved with variable allocation and binding, control flow, types, subroutines, parameter passing. • Develop an in-depth understanding of functional, logic, and object-oriented programming paradigms.
6	Credit Value	1 Credits
<i>Credit =30 Hours Laboratory or Field Learning/Training</i>		
7	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.	<ol style="list-style-type: none"> 1. Write a program in C++ for addition of two numbers using float data type. 2. Write a program in C++ to find the biggest number between two numbers. 3. Write a program in C++ to find the factorial value of any entered number using do - while loop. 4. Write a program in C++ for various arithmetic operations using switch case statements. 5. Write a program in C++ for Multiplication of two 3X3 matrices. 6. Write a program in C++ to store five books of information using structure. 7. Write a program in C++ to store six employee information using union. 8. Write a program in C++ to calculate simple interest using call by value and call by reference method. 9. Write a program in C++ to find the sum and average of five numbers using class and objects. 10. Write a program in C++ to multiply two numbers using private and public member functions. 11. Write a program in C++ to print structure like this using scope resolution operator 2 2 3 2 3 4 2 3 4 5 12. Write a program in C++ for constructor and Destructor. 	30

13. Write a program in C++ for multiple inheritance.
14. Write a program in C++ for operator overloading.
15. Write a program in C++ for friend class and friend function.
16. Write a program in C++ for virtual function and virtual class.
17. Write a program in C++ for Exception Handling.
18. Write a program in C++ to open and close a file using file Handling.
19. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
20. WAP to display Fibonacci series (i) using recursion, (ii) using iteration
21. WAP to calculate Factorial of a number (i) using recursion, (ii) using iteration
22. WAP to calculate GCD of two numbers (i) with recursion (ii) without recursion.
23. Create a Matrix class using templates. Write a menu-driven program to perform following Matrix Operations (2-D array implementation): a) Sum b) Difference c) Product d) Transpose
22. Create the Person class. Create some objects of this class (by taking information from the user). Inherit the class Person to create two classes Teacher and Student class. Maintain the respective information in the classes and create, display and delete objects of these two classes (Use Runtime Polymorphism).
24. Create a class Triangle. Include overloaded functions for calculating area. Overload assignment operator and equality operator.
25. Create a class Box containing length, breadth and height. Include following methods in it: a) Calculate surface Area b) Calculate Volume c) Increment, Overload ++ operator (both prefix & postfix) d) Decrement, Overload -- operator (both prefix & postfix) e) Overload operator == (to check equality of two boxes), as a friend function f) Overload Assignment operator g) Check if it is a Cube or cuboid
26. Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.
27. Write a program to retrieve the student information from the file created in the previous question and print it in the following format: Roll No. Name Marks
28. Copy the contents of one text file to another file, after removing all whitespaces.
29. Write a program for exception handling.
30. Write a program to insert data into file and to display it.

Note: Concerned teacher can add additional experiment as per requirement.

Keywords Array, Function, Structure, union, matrix, constructor, destructor, inheritance.

Name and Signature of Convener & Members of CBSE:

Dr. H.S. Hota
Chairman (Dr. B. Dubey)
(Dr. S. Saini)
(Dr. Anil Chawla)
(Dr. R. Khuntia)
(Dr. A. S. ...)

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Peter Juliff, Program Design, PHI Publications.
- Yashwant Kanetkar, Let us C: BPB Publications.
- E. Balaguruswamy, Programming in ANSI C, Tata McGraw Hill

Reference Books Recommended:

- Y. Kanetkar, Let us C++, B.P.B Publication.
- E. Balaguruswamy, Programming in C++, Tata McGraw Hill.

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester – II	Session: 2024-2025
1	Course Code	CASC -06T	
2	Course Title	Data Structure	
3	Course Type	DSC (Discipline Specific Course)	
4	Prerequisite (if, any)	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the fundamentals and applications of data structure. • Utilize various algorithms for real world problem solving. • Understanding about data management in computer memory. • Apply stack, Queue, Lists, Trees and Graphs for real world application. • Understand how various data structures can be used to implement through any programming language. 	
6	Credit Value	3 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART -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 and Basic Concepts: Introduction, Fundamentals of Algorithms, Data types: Primitive, Non-Primitive Absent Data Type (ADT), Classification of Data Structure: Linear and Nonlinear Data Structure. Array: Arrays and its types, Memory allocation and address calculations of Array, Sparse Array. Linked List: Types of Linked List and various Operations Like INSERT, DELETE, TRAVERSE. Introduction and Application of Stack and Queue.	12
II	Stack: Definition, Operations PUSH, POP, Implementations using Array and Linked list, Applications of Stack: Infix, Prefix, Postfix representation and conversion using Stack, Postfix expression evaluation using Stack, Recursion using Stack. Queue: Definition, Types of Queues: Priority Queue, Circular queue, Double Ended Queue, operations of Queue INSERT, DELETE, TRAVERSE, Implementation Queue using Array and Linked list, Applications of Queue.	11
III	Tree: Definition of Trees and their types, Binary trees, Properties of Binary trees and operations Insertion, deletion, searching and traversal algorithm: preorder, post order, in-order traversal, Binary Search Trees, Implementations, AVL Trees. Graph: Definition of Graph and their types, Adjacency and Incident (matrix & linked list) Representation of graphs, Graph Traversal – Breadth first Traversal, Depth first Traversal, Connectivity of Graphs; Weighted Graphs, Shortest Path Algorithm, Spanning Tree, Minimum Spanning Tree, Kruskal's and Prim's Algorithms.	11
IV	Sorting Methods: Types of Sorting Selection Sort, Insertion Sort, Bubble Sort, Quick Sort, Merge Sort, Radix Sort. Searching: Linear search, Binary search.	11

Keywords Data, ADT, Array, Linked List, Stack, Queue, Tree, Graph, Searching, Sorting.

Name and Signature of Convener & Members of CBoS:

Dr. A.S. Hota *(Chairman)*
 Dr. K.B. Dubey *(Member)*
 Sushil Kumar *(Member)*
 Suresh Kumar *(Member)*
 Anjeeta Kujur *(Member)*
 Dr. Anil Sharma *(Member)*
 Dr. S.S. Sharma *(Member)*
 Dr. S. Jain *(Member)*
 Dr. Khurshid *(Member)*

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Michael T. Goodrich, Data Structures and Algorithms in C++, Wiley
- Horowitz and Sahani, Fundamentals of Data Structures, Computer Science Press

Reference Books Recommended:

- Alfred V. Aho, Data structures and Algorithms, Jhon E. Hopcroft and J.E. Ullman.
- Jean Paul Trembley and Paul Sorenson, An Introduction to Data Structures with Applications, TMH, International Student Edition
- R. Kruse, Leung & Tondo, Data Structures and Program Design in C, PHI publication, 2nd Edition

Online Resources:

- NPTEL YouTube Channel: Data Structure Complete course
- <https://youtube.com/playlist?list=PLc2MoXNv7E4mtsPlnn9BnTOENXsGyoDgR&si=iAYaVZ-vWfcuhFEO>
- NPTEL YouTube Channel: Introduction to Data Structure
- <https://www.youtube.com/watch?v=zWg7U0OEAOE&list=PLBF3763AF2E1C572F&index=1>
- NPTEL YouTube Channel: Stacks
- <https://www.youtube.com/watch?v=g1USSZVWDsY&list=PLBF3763AF2E1C572F&index=2>
- NPTEL YouTube Channel: Queues and linked list
- <https://www.youtube.com/watch?v=PGWZUgzDMYI&list=PLBF3763AF2E1C572F&index=3>
- NPTEL YouTube Channel: Trees
- <https://www.youtube.com/watch?v=tORLeHhtazM&list=PLBF3763AF2E1C572F&index=6>
- NPTEL YouTube Channel: Graphs
- <https://www.youtube.com/watch?v=9zpSs845wf8&list=PLBF3763AF2E1C572F&index=24>
- W3schools Data Structure Reference: DSA Tutorial (w3schools.com)

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 & 20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
	Total Marks - 30	

End Semester Exam (ESE):	Two section - A & B Section A: Q1. Objective - 10 x1= 10 Mark; Q2. Short answer type- 5x4= 20 Marks Section B: Descriptive answer type qts., out of 2 from each unit-4x10= 40 Marks
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Name and Signature of Convener & Members of CBoS:

Dr. P. S. Hota  Chairman
 Dr. K. B. Dubey 
 Dr. S. K. Saha 
 Dr. Suresh Thakur 
 Dr. Anil Sharma 
 Dr. Anjeeta Kujur 
 Dr. K. Khuntia 
 Dr. P. S. Hota 
 Dr. Anjeeta Kujur 

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application <i>(Certificate / Diploma / Degree)</i>		Semester – II	Session: 2024-2025
1	Course Code	CASC-06P	
2	Course Title	Lab 4: Data Structure Using C++	
3	Course Type	Practical	
4	Prerequisite (if, any)	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand how the concept of data structure can be implemented programmatically. • Implement the fundamentals data structure through C and C++ • Understand the functioning of Array and linked list programmatically. • Understand the applications of array, linked list stack, queue, tree and graph programmatic. • Write programs for various data structures for real world application. 	
6	Credit Value	1 Credits	<i>Credit =30 Hours Laboratory or Field Learning/Training</i>
7	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
Lab./Field Training/ Experiment	<ol style="list-style-type: none"> 1. Write a program to create a square matrix, fill the data inside and print the diagonal elements. 2. Write a program to perform addition and subtraction on two matrices. 3. Write a program to perform multiplication on two matrices. 4. Write a program to perform insertion, deletion of nodes from the end in singly linked list. 5. Write a program to perform insertion and deletion of nodes from the end in singly linked list. 6. Write a program to perform insertion and deletion of nodes from the end in circular doubly linked list. 7. Write a program to perform push and pop operations in stack, where stack should be created using array. 8. Write a program to perform push and pop operation in stack, where stack should be created linked list. 9. Write a program to calculate factorial of given number using stack. 10. Write a program to perform insertion and deletion of data items in queue, queue should be implemented by using a linked list. 11. Write a program to perform insertion and deletion of data items in queue, queue should be implemented by using arrays. 12. Write a program to demonstrate functioning of a double ended queue. 13. Write a program to read the postfix arithmetic expression and evaluate its value using the stack. 14. Write a program to show how to handle the overflow and underflow situation in stack. 15. Write a program to convert infix notation-based expression into the postfix notation-based expression using the stack. 16. Write a program to implement the concept of priority-based element 		30

- NPTEL YouTube Channel: Queues and linked list
<https://www.youtube.com/watch?v=PGWZUgzDMYI&list=PLBF3763AF2E1C572F&index=3>
- NPTEL YouTube Channel: Trees
<https://www.youtube.com/watch?v=ORLeHHtazM&list=PLBF3763AF2E1C572F&index=6>
- NPTEL YouTube Channel: Graphs
<https://www.youtube.com/watch?v=9zpSs845wf8&list=PLBF3763AF2E1C572F&index=24>
- W3schools Data Structure Reference: DSA Tutorial (w3schools.com)

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
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End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) - 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status
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Name and Signature of Convener & Members of CBoS:

Dr. H.S. Moha Chairman (Dr. K.B. Dubey)	(Dr. K. Saty)	(Dr. Anil Sharma)	Dr. S. Jain
(Suresh Kumar Baku)	(Suresh Thakur)	ANJEEVA KUMAR	R. Khosla
Secretary			COO A.S. Sharma

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Rajib Mall, Fundamentals of Software Engineering, 5th ed, PHI publication.
- Roger S. Pressman, Software Engineering, A practitioner's Approach, 6th edition, McGraw Hill International Edition.

Reference Books Recommended:

- Sommerville, Software Engineering, 7th edition, Pearson Education.
- James Rumbaugh, Ivar Jacobson, The unified modelling language user guide Grady Booch, Pearson Education.

Online Resources:

- NPTEL YouTube Channel: Software Engineering Lectures by Prof Rajib Mall, IIT Kharagpur
<https://youtube.com/playlist?list=PLbRMhDVUMngf8oZR3DpKMvYhZKga90JVt&si=ITBITZUdivHpNz1H>
- NPTEL YouTube Channel: Software Engineering Lecture Series
https://youtube.com/playlist?list=PL8751DA481F0F0D17&si=07IfYV7GP8_oc1xZ

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 & 20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
	Total Marks - 30	

End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x 1 = 10 Mark; Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts., 1out of 2 from each unit-4x10=40 Marks
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Name and Signature of Convener & Members of CBaS:

Dr. H. S. Hota

Chairman (Dr. K. B. Dubey)

(Dr. S. K. Sahas)

(Sushil Kumar Sahas)

(Suresh K. Thakur)

(Dr. Anil Kumar)

(Dr. Anil Kumar)

(Dr. A. S. Sharma)

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(Dr. Anil Kumar)

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

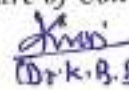



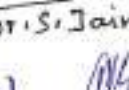


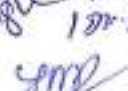
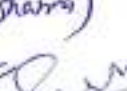
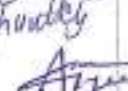











PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree)		Semester - III	Session: 2024-2025
1	Course Code	CASC-08P	
2	Course Title	Lab 5: Relational Database Management System (Oracle/MySQL)	
3	Course Type	Practical	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	<p>At the end of this course, the students will be able to:</p> <ul style="list-style-type: none"> • 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. 	
6	Credit Value	1 Credits	Credit =30 Hours Laboratory or Field Learning/Training
7	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	<ol style="list-style-type: none"> 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 : <ol style="list-style-type: none"> 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. <ol style="list-style-type: none"> 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.

Note: Concerned teacher can add additional experiment as per requirement.

Keywords TABLE, SQL, PL/SQL.

Name and Signature of Convener & Members of CBAS:

Dr. H. S. Hota (Chairman) 
 Dr. K. B. Dubey 
 Dr. S. S. Sahu 
 Dr. Anil Sharma 
 Dr. R. Khuntia 
 Dr. S. J. Sahu 
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 Dr. S. K. Sahu

- 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/foL9Ve2SRwQ>
- SWAYAM URL link for DBMS and RDBMS :
<https://swayam.gov.in/courses/4434-data-base-management-system>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
	Assignment/Seminar +Attendance - 05 Total Marks - 15	
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment	Managed by Course teacher as per lab. status
	A. Performed the Task based on lab. work - 20 Marks	
	B. Spotting based on tools & technology (written) - 10 Marks	
	C. Viva-voce (based on principle/technology) - 05 Marks	

Name and Signature of Convener & Members of CBAS:

Dr. H.S. Bhatia (Chairman) 
 Dr. K.B. Dubey 
 Dr. S.K. Saha 
 Dr. Anil Sharma 
 Dr. S. Jain 
 Dr. Anil Sharma 
 R. Khurshid 
 Anjeeta Kujur 
 Shreya 
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PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Naughton P and Schildt H., Osborne, The complete reference, McGraw-Hill, Berkeley Publication.
- James R. Laverick, An Introduction to JAVA programming, Firewall Media publication.

Reference Books Recommended:

- E. Balgurusamy, Java Programming, McGraw-Hill Publication.
- Rashmi Kanta Das, Core JAVA for beginners, Vikas Publication.

Online Resources:

- SWAYAM URL Link for Java
 - o https://onlinecourses.swayam2.ac.in/aic20_sp13/preview
 - o https://onlinecourses.nptel.ac.in/noc19_cs84/preview
 - o <https://www.dqindia.com/iit-bombay-offers-free-online-course-java-swayam-platform/>
 - o <https://www.classcentral.com/course/swayam-programming-in-java-12930>
- W3schools Java Tutorial.
Java Tutorial (w3schools.com)
- Online Platforms to Exercise and Execute the Java Programs
 - o Online Java Compiler (programiz.com)
 - o Solve Java | HackerRank
 - o Online Java Compiler - Online Java Editor - Java Code Online (jdoodle.com)
- NPTEL Channel: Programming in Java
Programming In Java - Course (nptel.ac.in)

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20	Better marks out of the two Test / Quiz obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
	Total Marks - 30	

End Semester Exam (ESE):

Two section – A & B

Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks

Section B: Descriptive answer type qts., 1 out of 2 from each unit-4x10=40 Marks

Name and Signature of Convener & Members:

Dr. H.S. Moha

Chairman

Dr. K. Man

Bala Dabey

(Dr. S.K. Sahu)

(Dr. Anil Sharma)

(Dr. Anil Sharma)

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ANJETA KURUR

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction		
Program: Bachelor in Computer Application <i>(Certificate / Diploma / Degree)</i>		Semester – III
		Session: 2025-2026
1	Course Code	CASC-9P
2	Course Title	Lab 6: Programming in Java
3	Course Type	Practical
4	Prerequisite (if, any)	<i>As per program</i>
5	Course Learning Outcomes (CLO)	<p>At the end of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Execute the program in java • Implement the concept of multi-threading • Develop new Packages which help them to develop new application software and Utility Software. • Develop new Online Software and Internet Games with the help of Applet and AWT Packages. • Familiar about Applet, Thread and Servlet Life Cycle which helps them to develop value added services for Internet Users.
6	Credit Value	1 Credits <i>Credit =30 Hours Laboratory or Field Learning/Training</i>
7	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
Lab./Field Training/ Experiment Contents of Course	<ol style="list-style-type: none"> 1. Write a program to check palindrome number. 2. Write a program to check Armstrong number. 3. Write a program to check the prime number. 4. Write a program to calculate simple interest using the GUI Form. 5. Write a program to demonstrate the thread life cycle. 6. Write a program to show the use of applet. 7. Write a program to demonstrate the concept of arrays. 8. Write a program to find the second largest and second smallest number in array. 9. Write a program to perform multiplication of two matrices. 10. Write a program to demonstrate the concept of method overloading. 11. Write a program to demonstrate the concept of constructor overloading. 12. Write a program to demonstrate the concept of inner classes. 13. Write a program to demonstrate the concept of inheritance. 14. Write a program to demonstrate the concept of access specifiers in java. 15. Write a program to implement the concept of interface. 16. Write a program to show the creation of package in java. 17. Write a program to design the user registration form with basic registration details. 18. Write a program to show the exception handling process in java. 19. Write a program to show the significance of multithreading. 20. Write a program to read the data from the console device and store it in any file in secondary storage. 21. Write a program to copy the content of any file into another file. 22. Write a program to demonstrate the advantages of event delegation model. 23. Write a program in java for command line value passing. <p>Note: Concerned teacher can add additional practical exercises as per requirement.</p>	30

Keywords Class, Object, interface, Inheritance, package, exception handling, threads, applet, AWT.

Name and Signature of Convener & Members:

Dr. H.S. Hoty *Xiron*
 Chairman (Dr. B. Dubey) *(Dr. S.K. Saha)* *(Dr. Anil Sharma)* *(Dr. S. Jain)* *R. Khuntia*
(Sushil Kumar Saha) *(Dr. Anil Sharma)* *(Dr. S. Jain)* *(Dr. Anil Sharma)* *(Dr. S. Jain)* *(Dr. Anil Sharma)*
(Dr. Anil Sharma) *(Dr. S. Jain)* *(Dr. Anil Sharma)* *(Dr. S. Jain)* *(Dr. Anil Sharma)* *(Dr. S. Jain)*
 ANJEETA KUMAR

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Naughton P and Schildt H., Osborne, The complete reference, McGraw-Hill, Berkeley Publication.
- James R. Laverick, An Introduction to JAVA programming, Firewall Media publication.

Reference Books Recommended:

- E. Balgurusamy, Java Programming, McGraw-Hill Publication.
- Rashmi Kanta Das, Core JAVA for beginners, Vikas Publication.

Online Resources:

- SWAYAM URL Link for Java
 - o https://onlinecourses.swyam2.ac.in/aic20_sp13/preview
 - o https://onlinecourses.nptel.ac.in/noc19_cs84/preview
 - o <https://www.dqindia.com/iit-bombay-offers-free-online-course-java-swayam-platform/>
 - o <https://www.classcentral.com/course/swyam-programming-in-java-12930>
- W3schools Java Tutorial.
 Java Tutorial (w3schools.com)
- Online Platforms to Exercise and Execute the Java Programs
 - o Online Java Compiler (programiz.com)
 - o Solve Java | HackerRank
 - o Online Java Compiler - Online Java Editor - Java Code Online (jdoodle.com)
- NPTEL Channel: Programming in Java
 Programming In Java - Course (nptel.ac.in)

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks
 Continuous Internal Assessment (CIA): 15 Marks
 End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
	Assignment/Seminar + Attendance - 05	
	Total Marks - 15	
End Semester Exam (ESE):	Laboratory / Field Skill Performance:	Managed by Course teacher as per lab. status
	On spot Assessment	
	A. Performed the Task based on lab. work - 20 Marks	
	B. Spotting based on tools & technology (written) - 10 Marks	
	Viva-voce (based on principle/technology) - 05 Marks	

Name and Signature of Convener & Members:

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 Chairman (Dr. B. Dubey) *(Dr. S.K. Saha)* *(Dr. Anil Sharma)* *(Dr. S. Jain)* *R. Khuntia*
(Sushil Kumar Saha) *(Dr. Anil Sharma)* *(Dr. S. Jain)* *(Dr. Anil Sharma)* *(Dr. S. Jain)* *(Dr. Anil Sharma)*
 ANJEETA KUMAR

PART-C: Learning Resources

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.
- Tools Alfred V. Aho, Ravi Sethi, D. Jeffrey Ullman and Monica S. Lam , Compilers Principles, Techniques and Tools, Addison Wesley.

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=PLbMVogVj5nJSd25WnSU144ZyGmsquKr3&si=EvuSjnOTT1oTHjn>
- 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-wYxht4yCgBHUpwXDTLos3JStccGlax&si=TbYH91hmlOrtUEnN>
- SWAYAM YouTube Channel: Introduction to Automata, Languages and Computations
https://youtube.com/playlist?list=PLbRMhDVUMngewWkzVTm_kFH6JW4JCtAUM&si=RbTG3WZ0Jf6Zx_ptu
- NPTEL YouTube Channel:
<https://www.youtube.com/watch?v=ck1Lnm28hQ&list=PLbRMhDVUMngescCW7wXDviTDemCuH80tP>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz (-2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
--------------------------------------------------------------	------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------

End Semester Exam (ESE):	Two section - A & B Section A: Q1. Objective - 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit-4x10=40 Marks
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Name and Signature of Convener & Members of CBAS:

Dr. H.S. Hota *Hota*
Chairman

Dr. K.B. Dubey *Dubey*
(Dr. SK Saini) *Saini*

Yes
Deyger
Kotwal

Amr
(Dr. Anil Sharma)

Dr. S. Jain
Dr. S

Sushil
(Sushil Kumar Sahu)

SK
(Suresh Thakur)

R. Khuntia

Shubham Singh

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Anand Kumar

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ANJETA KUTUR

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester - IV	Session: 2024-2025
1	Course Code	CASC-IIT	
2	Course Title	Web Technology	
3	Course Type	DSC (Discipline Specific Course)	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> 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. 	
6	Credit Value	3 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART -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: 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

Keywords Webpage, Website, HTML, AJAX, CSS, JavaScript, PHP, MySQL

Name and Signature of Convener & Members of CoS:

Dr. H. S. Hota (Chairman) 
 Dr. K. B. Dabey 
 Dr. S. K. (Convener) 
 Dr. S. K. Saha 
 Dr. S. K. Saha 
 Dr. S. K. Saha 
 Dr. S. K. Saha 
 Dr. S. K. Saha 
 Dr. S. K. Saha 
 ANJEEETA KUMAR 

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction																																		
Program: Bachelor in Computer Application (Certificate / Diploma / Degree)			Semester – IV		Session: 2024-2025																													
1	Course Code	CASC-11P																																
2	Course Title	Lab 7: Web Technology																																
3	Course Type	Practical																																
4	Prerequisite	As per program																																
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • 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. 																																
6	Credit Value	1 Credits	Credit =30 Hours Laboratory or Field Learning/Training																															
7	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																												
Lab./Field Training/ Experiment	<p style="text-align: center;">HTML</p> 1. Write HTML code to create the following table: <table border="1" style="margin-left: 40px; margin-top: 10px;"> <thead> <tr> <th>Class</th> <th>Subject 1</th> <th>Subject 2</th> <th>Subject 3</th> </tr> </thead> <tbody> <tr> <td>BCA-I</td> <td>Visual Basic</td> <td>PC Software</td> <td>Electronics</td> </tr> <tr> <td>BCA-II</td> <td>C++</td> <td>DBMS</td> <td>English</td> </tr> <tr> <td>BCA-III</td> <td>Java</td> <td>Multimedia</td> <td>CSA</td> </tr> </tbody> </table> 2. Write HTML code to create the following lists: <ul style="list-style-type: none"> • C • C++ • Fortran • COBOL 3. Write HTML code to create the following lists: <ol style="list-style-type: none"> 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: <table border="1" style="margin-left: 40px; margin-top: 10px;"> <thead> <tr> <th>Course</th> <th>OC</th> <th>BC</th> <th>MB</th> <th>SC/ST</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </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	Course	OC	BC	MB	SC/ST	Total							30
Class	Subject 1	Subject 2	Subject 3																															
BCA-I	Visual Basic	PC Software	Electronics																															
BCA-II	C++	DBMS	English																															
BCA-III	Java	Multimedia	CSA																															
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 :

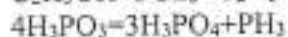
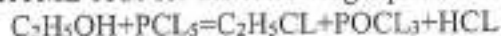
When user types characters in a password field, the browser displays asterisks or bullets instead of character.

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:



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 Schwag
 - 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.

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.

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, papename)

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.

Keywords HTML, Hyperlinks, Form, List, Table, CSS, JavaScript, MySQL, PHP.

Signature of Convener & Members of CBOS:

Dr. H.S. Hota

Chairman (Dr. K.B. Dubey)

(Sushil Kumar Bahu)

(Dr. S.K. Singh)

(Sourabh Kataria)

(Dr. S. Jain)

(Dr. Anil Sharma)

(Dr. S. Jain)

(Dr. S. Jain)

(Dr. S. Jain)

(Dr. S. Jain)

(Dr. S. Jain)

(Dr. S. Jain)

PART-C: Learning Resources

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>

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application <i>(Certificate / Diploma / Degree/Honors)</i>		Semester - IV	Session: 2024-2025
1	Course Code	CASC-12T	
2	Course Title	Python Programming	
3	Course Type	DSC (Discipline Specific Course)	
4	Prerequisite	As per Program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> 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. 	
6	Credit Value	3 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART -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 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

Keywords: List, Tuple, Dictionary, Panda, Numpy, TensorFlow, Scikit-Learn, Keras, PyTorch, SciPy.

Name and Signature of Convener & Members of CBA:

Dr. H.S. Hota *Chairman*
 Dr. K.B. Dubey
 Sushil Kumar Sahu
 Dr. S.K. Sahu
 Gaurav Thakur
 Dr. Anand Sharma
 Dr. R. K. Mishra
 Dr. S. Jain
 Anshika Kaur
 Anshika Kaur

PART-C: Learning Resources

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, Freely available online. 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=eoPsX7MKfe8&list=PLIdgECt554OVFKXRpo_kul0XpUQKk0vcO
- 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/UCxulcR5XRauYn37vg-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/>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal
Assessment (CIA):
(By Course Teacher)

Internal Test / Quiz-(2):	20	+20
Assignment / Seminar -	10	
Total Marks -	30	

Better marks out of the two Test / Quiz
+ obtained marks in Assignment shall
be considered against 30 Marks

End Semester Exam (ESE):	Two section - A & B Section A: Q1. Objective - 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit-4x10= 40 Marks				
Name and Signature of Convener & Members of CBAS:					
Dr. H.S. Hong Chairman	Dr. K.B. Dubay	Dr. S.K. Sahu	Dr. P. K. Mishra	Dr. Anil Sharma	Dr. S. Jain (Dr. A.S.)
Sushil (Sushil Kumar Sahu)	SK (Kareesh Thakur)	S (Sushil Kumar Sahu)	YMP (Dr. Anil Sharma)	R. Khurdey ANJEEETA KUTUR	(Dr. A.S.)

Section
Kumar

Sushil

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction		
Program: Bachelor in Computer Application (Certificate / Diploma / Degree)		Semester - IV
		Session: 2024-2025
1	Course Code	CASC-12P
2	Course Title	Lab 8: Python Programming
3	Course Type	Practical
4	Prerequisite	As per program
5	Course Learning Outcomes (CLO)	<p>At the end of this course, the students will be able to:</p> <ul style="list-style-type: none"> • 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.
6	Credit Value	1 Credits <i>Credit =30 Hours Laboratory or Field Learning/Training</i>
7	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 Experiment 8	<p>Note: This is tentative list; the teachers concern can add more program as per requirement.</p> <ol style="list-style-type: none"> 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 sines, 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 $1 + 1/1! + 1/2! + 1/3! + \dots + 1/n$ 	30

	<ol style="list-style-type: none"> 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.
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Keywords List, Tuple, Dictionary, Panda, Numpy, TensorFlow, Scikit-Learn, Keras, PyTorch, SciPy.

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman
[Signature]

[Signature]
Eswar (Thakur)
[Signature]

[Signature]
Shrinidhi
Arya

[Signature]
Dr. S. Jain

[Signature]
R. Khattar
[Signature]
Dr. A.S. Jain

[Signature]
ANSEETA KUMAR

[Signature]
Laxmi
[Signature]

PART-C: Learning Resources

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, Freely available online. 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)

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- NPTEL URL link for Python Programming:
https://www.youtube.com/watch?v=eoPsX7MKfc8&list=PLldgECt554OVFKXRpo_kul0XpUOKk0vcO
- 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/UCXuJcR5XRauYn37yg-Fl6rA>
 - <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/>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: **50 Marks**
 Continuous Internal Assessment (CIA): **15 Marks**
 End Semester Exam (ESE): **35 Marks**

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) - 10 Marks Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

Dr. H. S. Hota
 chairman
 Anil Kumar
 Anurag Thakur
 Shri Krishna Agni
 Anjitha Anjitha Kumar
 ...

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction		
Program: Bachelor in Computer Application <i>(Certificate / Diploma / Degree/Honors)</i>		Semester – V
		Session: 2024-2025
1	Course Code	CASC-13
2	Course Title	Data Mining and Data Warehousing
3	Course Type	DSC (Discipline Specific Course)
4	Prerequisite	<i>As per program</i>
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Store voluminous data for online processing. • Preprocess the data for mining applications. • Apply the association rules for mining the data. • Design and deploy appropriate classification techniques. • Cluster the high dimensional data for better organization of the data. • Evaluate various mining techniques on complex data objects.
6	Credit Value	4 Credits <i>Credit = 15 Hours - Learning & Observation</i>
7	Total Marks	Max. Marks: 100 Min Passing Marks: 40
PART -B: 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: What is data mining? Why it is important? Mining on what kind of data, Data mining Functionalities, steps of data mining, Knowledge discovery. Data Warehouse: Meaning, definition, OLTP vs. OLAP, Data warehouse architecture, Three Tier Architecture Data warehouse architecture, Data cube and OLAP technology.	15
II	Association Rule: Basic concept, Frequent item set mining: Apriori algorithm etc., mining various kind of association rules: Mining Multilevel association rules, mining multidimensional association rules.	15
III	Classification and Prediction: What is classification and prediction, Decision tree algorithms: CART, ID3 C4.5, CHAID, Bayesian classification, Rule based classification, Classification by backpropagation, Support vector machine, Association classification and other classification methods. Prediction using Regression and Neural Network methods, Accuracy measures, Ensemble methods.	15
IV	Cluster Analysis: What is cluster analysis?, Partitioning method, Hierarchical methods, Experiments with python data mining tools for model development, data preprocessing, feature selection for Financial data, health care data etc.	15
Keywords	<i>Data Mining, Data Warehouse, Knowledge discovery, OLTP, OLAP, Data cube, CART, CHAID, Regression.</i>	
Name and Signature of Convener & Members of CBoS:		
<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> <p><i>Dr. H. S. Hota</i> Chairman</p> <p><i>Smit</i></p> </div> <div style="text-align: center;"> <p><i>K. S. ...</i> (Secretary)</p> </div> <div style="text-align: center;"> <p><i>...</i> ...</p> </div> <div style="text-align: center;"> <p><i>...</i> ...</p> </div> <div style="text-align: center;"> <p><i>...</i> ...</p> </div> <div style="text-align: center;"> <p><i>...</i> ...</p> </div> </div>		
<p><i>...</i> ANJEETA KUMAR</p>		

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Data Mining: Concepts and Techniques, Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishes (Elsevier, 2nd edition), 2006.
- Data Mining Methods for Knowledge Discovery, Cios, Pedrycz, Swiniarski, Kluwer Academic Publishers, London – 1998.

Reference Books Recommended:

- Data mining techniques, Arun K Pujari, Universities Press (India) private limited, 2007.
- Data Mining, Data Warehousing and OLAP, Gajendra Sharma, S.K. Kateria and Sons, 2010.

Online Resources:

- Tutorials:
 - <https://docs.oracle.com/database/121/DWHSG/concept.htm#DWHSG-GUID-452FBA23-6976-4590-AA41-1369647AD14D>
 - <https://www.tutorialspoint.com/dwh/index.htm#:~:text=A%20data%20warehouse%20is%20co nstructed,necessary%20concepts%20of%20data%20warehousing>.
 - <https://intellipaat.com/blog/tutorial/data-warehouse-tutorial/>
 - <https://www.guru99.com/data-warehousing-tutorial.html>
 - <https://www.javatpoint.com/data-warehouse>
 - <https://www.softwaretestinghelp.com/data-warehousing-fundamentals/>
 - https://www.tutorialspoint.com/data_mining/index.htm
 - <https://www.javatpoint.com/data-mining>
 - <https://www.guru99.com/data-mining-tutorial.html>
 - <https://www.mygreatlearning.com/blog/data-mining-tutorial/>
 - <https://www.tutorialride.com/data-mining/data-mining-tutorial.htm>
 - <https://data-flair.training/blogs/data-mining-tutorial/>
 - <https://www.geeksforgeeks.org/data-mining/>
- Lab Manuals:
 - <https://siet.ac.in/wp-content/uploads/2020/02/DM-LAB-MANUAL-IV-CSE-1-SEM.pdf>
 - <https://mrceit.com/pdf/Lab%20Manuals/CSE%20IV-1%20SEM.pdf>
 - <https://mrceit.com/pdf/Lab%20Manuals/IT%20III%20B.TECH%20%20SEM-II%20DWDWM-R17A0590%20LAB%20MANUAL%202019-20.pdf>
 - https://www.iare.ac.in/sites/default/files/lab1/IARE_DWDM_AND_WT_LAB_MANUAL.pdf
 - <http://www.apgcm.edu.in/images/data-mining-lab-manual.pdf>
 - <https://www.jnec.org/labmanuals/cse/be/sem1/DWDM-BE-PART-I.pdf>
 - <https://www.jnec.org/labmanuals/it/be/sem1/DWDM-lab.pdf>
 - <https://www.bharathuniv.ac.in/downloads/csc/BCS6L1-DWDM%20lab.pdf>
 - <http://www.nrcmec.org/pdf/Manuals/CSE/student/4-1%20dwdm16-17.pdf>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA):	Internal Test / Quiz-(2): 20 +20	Better marks out of the two Test / Quiz + obtained marks in Assignment
	Assignment / Seminar - 10	

(By Course Teacher)	Total Marks -	30	shall be considered against 30 Marks
End Semester Exam (ESE):	Two section - A & B Section A: Q1. Objective - 10 x 1 = 10 Mark; Q2. Short answer type- 5x4 = 20 Marks Section B: Descriptive answer type qts..1 out of 2 from each unit-4x10=40 Marks		
Name and Signature of Convener & Members of CBUS:			
Dr. H.S. Hota Chairman	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
<i>[Signature]</i>	<i>[Signature]</i> (Secretary)	<i>[Signature]</i> Dr. V.K. Gupta	<i>[Signature]</i>
<i>[Signature]</i> Shailendra Singh	<i>[Signature]</i>	<i>[Signature]</i> Anand	<i>[Signature]</i> Anjjeeta Kujur

PART-C: Learning Resources

Text Books Recommended:

- Visual Basic .Net Complete- by BPB Publications , New Delhi
- The Complete Reference VB.Net –by Jeffery R. Shapiro , Tata Mcgraw Hill.
- Bill Evjen, Jason Beres, et.al, Visual Basic .Net programming, Wiley Dreamtech India (p) Ltd.

Reference Books Recommended:

- Professional VB.Net 2003 – by Bill Evjen & others , Wiley Dreamtech India(P) Ltd. New Delhi
- Fergal Grimes, Microsoft .NET for programmers, Shroff Publishers & Distributors (P) Ltd.
- Thuan Thai & Hoang Q.Lam, .NET Framework Essentials, Shroff Publishers & Distributors (P) Ltd.
- MSDN online – by Microsoft




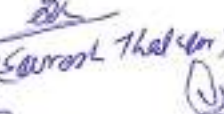
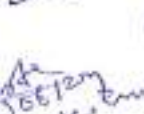

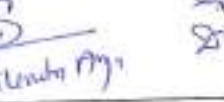
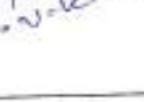

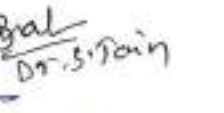

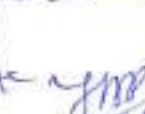



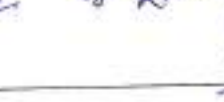

Online Resources:

- VB.Net Basic Tutorial:
https://www.tutorialspoint.com/vb.net/vb.net_loops.htm
- VB.NET Tutorial:
<https://www.javatpoint.com/vb-net>
- VB.NET Tutorial for Beginners: Learn VB.Net Programming :
https://www.guru99.com/vb-net-tutorial.html?gpp&gpp_sid
- Home and Learn: VB Net Programming Course Contents:
<https://www.homeandlearn.co.uk/NET/vbNet.html>
- Programming with VB.NET :
https://www.mcu.ac.in/wp-content/uploads/2020/04/1PGDCA4B-Part-I-Programming-with-VB-Net_.pdf
- Programming with visual Basic.Net (Notes in Hindi):
<https://computerhindinotes.com/programming-with-visual-basic-net-notes-in-hindi/>
- Programming with visual Basic.Net (Video Lectures in Hindi):
<https://computerhindinotes.com/visual-basic-net-video-tutorials-in-hindi>
- Visual Basic .NET The Complete Reference:
https://ravithanki.files.wordpress.com/2010/10/complete-reference-vb_net.pdf
- Learning Visual Basic.NET Language:
<https://riptutorial.com/Download/visual-basic--net-language.pdf>
- VB.NET Programming:
<https://mkasoft.com/downloads/VB.NET%20programming.pdf>
- Visual Basic.Net:
https://books-library.net/files/books-library.online_noo25328f31569407903f036b-8313.pdf
- Visual Basic.Net Black Book:
<https://bcaofficial.wordpress.com/wp-content/uploads/2017/05/vb-net-black-book.pdf>
- A Programmer's Introduction to Visual Basic.Net:
<https://www.interplat.com/vbnet.pdf>
- Visual Basic 2017 Made Easy :
https://www.vbtutor.net/vb2017/vb2017me_preview.pdf

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

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<i>Name and Signature of Convener & Members of CBaS:</i>		
Dr. H.S. Hora Chairman	 K. S. Kulkarni	 A. S. Patil
 S. S. Suresh	 S. S. Suresh	 A. S. Patil
 S. S. Suresh	 S. S. Suresh	 A. S. Patil
 A. S. Patil	 Dr. S. Jain	 A. S. Patil
 A. S. Patil	 Dr. S. Jain	 A. S. Patil
 A. S. Patil	 Dr. S. Jain	 A. S. Patil

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor of Computer Application (Certificate / Diploma / Degree)		Semester - V	Session: 2024-2025
1	Course Code	CASC-14P	
2	Course Title	Lab 9: Programming in .Net	
3	Course Type	Practical	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	After Completing this course, students will be able to: <ul style="list-style-type: none"> • Study and use of .NET framework and object-oriented programming. • Develop the console and GUI applications using .Net programming • Evaluate the .NET framework namespace contents. • Understand the procedures, File I/O, Error handling and Message queues. • Understand and remember the components in .NET IDE, ADO.NET and also the window forms. • Design, create, build, and debug dot net applications. 	
6	Credit Value	1 Credits	Credit =30 Hours Laboratory or Field Learning/Training
7	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	List of Experiments		No. of Period
List of practical experiments	<ol style="list-style-type: none"> 1. Write a program to addition, subtraction, multiplication and division of any two numbers. 2. Write a program to find the maximum between three numbers. 3. Write a program to check whether a number is negative, positive or zero. 4. Write a program to check whether a year is a leap year or not. 5. Design an application to input marks of five subjects Physics, Chemistry, Biology, Mathematics and Computer. Calculate percentage and grade as following: <ol style="list-style-type: none"> a. Percentage > 90%: Grade A b. Percentage >= 80%: Grade B c. Percentage > 70%: Grade C d. Percentage >60%: Grade D e. Percentage >= 40%: Grade E f. Percentage < 40%: Grade F 6. Design an application to input basic salary of an employee and calculate its Gross salary following: <ol style="list-style-type: none"> a. Basic Salary <= 10000: HRA = 20%, DA = 80% b. Basic Salary <n20000: HRA = 30%, DA = 90% c. Basic Salary > 20000: HRA = 30%, DA = 95% 7. Design an application to input electricity unit charges and calculate the given condition: <ol style="list-style-type: none"> a. For first 50 units Rs. 0.50/unit b. For next 100 units Rs. 0.75/unit c. For next 100 units Rs. 1.20/unit d. For unit above 250 Rs. 1.50/unit e. An additional surcharge of 20% is added to the bill 		30hrs.

8. Write a program to convert decimal to binary number system using bitwise operators.
9. Write a program to swap two numbers using the bitwise operator.
10. Write a program to create Simple Calculator using a select case.
11. Write a program to find the sum of all natural numbers between 1 to n.
12. Write a program to enter any number and print its reverse.
13. Write a program to enter any number and check whether the number is palindrome or not.
14. Write a program to check whether a number is Armstrong number or not
15. Write a program to print Fibonacci series up to n terms.
16. Write a program to print Pascal triangles up to n rows.
17. Write a program to print all negative elements in an array.
18. Design a digital clock using timer control
19. Create an application that offers various food items to select from check boxes and a mode of payment using a radio button. It then displays the total amount payable.
20. Create an application to implement the working of Context menu on textbox
21. Write a program to illustrate all functionalities of list box and combo box.
22. Write a program for temperature conversion using a radio button.
23. Write a program to launch a rocket using Picture Box and Timer control
24. Write a program to change the back color of any control using a scroll box.
25. Write a program to search an element for a one dimensional array.
26. Design a menu such that it contains submenu such as Addition, Subtraction, Scalar Multiplication, and Transpose of two metrics.
27. Write a program to find greatest among three given number using user define procedures
28. Write a program to check whether given number neon or not using user defined function
29. Write a program to check whether a given number is Niven or not using procedure.
30. Write a program to check whether a given number is duck number or not
31. Write a program to check whether a given number is a spy number or not.
32. Write a program to check whether a given number
33. Design the following application using radio button and checkbox:
34. Develop an application which is similar to notepad using menus.
35. Develop an application for facilitating purchasing order.
36. Develop an application for a billing system in a coffee shop.
37. Develop an application which is similar to login form.
38. Define structure student structure student has written member for storing name roll number name of three subjects and marks with member function to store and print data.
39. create a class circle with data member radius provide member function to calculate area driver class fare from class circle provide member function to calculate volume derived class cylinder from class is fair with additional data member for height and member function to calculate volume
40. Write a program that implements the concept of encapsulation.
41. Write a program to demonstrate the concept of function overloading.
42. Create a class student having a data member to store roll number name of the student name of three subject Max marks, Min marks, and obtained marks. Declare an object of class. Provide facilities to input data in data members and display result of students
43. Create a class array having an array of integer having five elements at data member provide following facilities: a) constructor to get number in array element b) sort the elements

44. Create a table for employees and write a program using a data set to add, delete, edit and navigate records.
45. Write a program to access a database using ADO.NET and display key columns in the combo box or list box when an item is selected in it its corresponding records are shown in data grid control.
46. Write a program to calculate factorial of a number using user defined procedure.

Note: This is a tentative list; the teachers' concern can add more experiment as per requirement.

Keywords .NET, Window form, GUI, MDI, ADO.Net.

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

[Signature]

[Signature]

[Signature]
Suresh Thakur

[Signature]
Shakti Singh Aggarwal

[Signature]
ANVEETA KUMAR

[Signature]
Dr. S. Jain

[Signature]
Dr. S. Jain

[Signature]
JMD

[Signature]
JMD

PART-C: Learning Resources

Text Books Recommended:

- Visual Basic .Net Complete- by BPB Publications , New Delhi
- The Complete Reference VB.Net –by Jeffery R. Shapiro , Tata Mcgraw Hill.
- Bill Evjen, Jason Beres, et.al, Visual Basic .Net programming, Wiley Dreamtech India (p) Ltd.

Reference Books Recommended:

- Professional VB.Net 2003 – by Bill Evjen & others , Wiley Dreamtech India(P) Ltd. New Delhi
- Fergal Grimes, Microsoft .NET for programmers, Shroff Publishers & Distributors (P) Ltd.
- Thuan Thai & Hoang Q.Lam, .NET Framework Essentials, Shroff Publishers & Distributors (P) Ltd.
- MSDN online – by Microsoft

Online Resources:

- VB.Net Basic Tutorial:
https://www.tutorialspoint.com/vb.net/vb.net_loops.htm.
- VB.NET Tutorial:
<https://www.javatpoint.com/vb-net>.
- VB.NET Tutorial for Beginners: Learn VB.Net Programming :
https://www.guru99.com/vb-net-tutorial.html?gpp&gpp_sid.
- Home and Learn: VB Net Programming Course Contents:
<https://www.homeandlearn.co.uk/.NET/vbNet.html>.
- Programming with VB.NET :
<https://www.mcu.ac.in/wp-content/uploads/2020/04/1PGDCA4B-Part-I-Programming-with-VB-.Net.pdf>
- Programming with visual Basic.Net (Notes in Hindi):
<https://computerhindinotes.com/programming-with-visual-basic-net-notes-in-hindi/>
- Programming with visual Basic.Net (Video Lectures in Hindi):
<https://computerhindinotes.com/visual-basic-net-video-tutorials-in-hindi/>
- Visual Basic .NET The Complete Reference:
https://ravithanki.files.wordpress.com/2010/10/complete-reference-vb_net.pdf

- Learning Visual Basic.NET Language:
<https://riptutorial.com/Download/visual-basic--net-language.pdf>
- VB.NET Programming:
<https://mkasoft.com/downloads/VB.NET%20programming.pdf>
- Visual Basic.Net:
https://books-library.net/files/books-library.online_noo25328f31569407903f036b-8313.pdf
- Visual Basic.Net Black Book:
<https://bcaofficial.wordpress.com/wp-content/uploads/2017/05/vb-net-black-book.pdf>
- A Programmer's Introduction to Visual Basic.Net:
<https://www.interplat.com/vbnet.pdf>
- Visual Basic 2017 Made Easy:
https://www.vbtutor.net/vb2017/vb2017me_preview.pdf
- Introduction and Programming of dotNet:
www.w3school.com

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz obtained marks in Assignment shall be considered against 15 Marks
--------------------------------------------------------------	-----------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------

End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) - 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status
--------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

[Signature]

[Signature]
Dr. V. V. Gupta

[Signature]
(Blouse Thakar)

[Signature]
Shweta Arora

[Signature]
ANJETA KUMAR

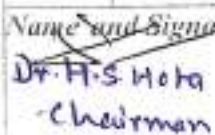
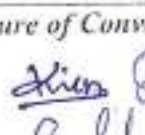

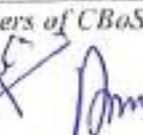
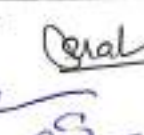



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[Signature]
Dr. Anurag Kumar

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FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor of Computer Application <i>(Certificate / Diploma / Degree/Honors)</i>		Semester - V	Session: 2024-2025
1	Course Code	CASC-15T	
2	Course Title	Machine Learning	
3	Course Type	DSC (Discipline Specific Course)	
4	Prerequisite	<i>As per program</i>	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • 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. 	
6	Credit Value	3 Credits	<i>Credit = 15 Hours - learning & Observation</i>
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART -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: 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 Descent vs. 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
Keywords	<i>Artificial Intelligence (AI), Linear Regression, Logistic Regression, Artificial Neural Network (ANN).</i>		
Name and Signature of Convener & Members of CBoS:			
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;"> <p>Dr. H.S. Moha Chairman</p>  </div> <div style="text-align: center;"> <p>Hitesh</p>  </div> <div style="text-align: center;"> <p>Prakash</p>  </div> <div style="text-align: center;"> <p>Shruti</p>  </div> <div style="text-align: center;"> <p>Surish Thakur</p>  </div> <div style="text-align: center;"> <p>Deval</p>  </div> <div style="text-align: center;"> <p>Shruti</p>  </div> <div style="text-align: center;"> <p>Shruti</p>  </div> </div>			

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-shwartz, 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, Aaron Courville, Adaptive computation and machine learning series.
- Machine learning, Tom M. Mitchell, McGraw Hill, Indian Edition.

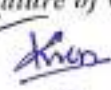
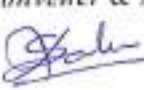





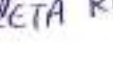

















































































Online Resources:

- Overview of Machine Learning:
https://www.youtube.com/watch?v=whSKA8aO6xQ&list=PLyqSpQzTE6M-SlSTunGRBRiZk7opYBf_K&index=3
- Introduction to Artificial Intelligence:
https://www.youtube.com/watch?v=pKeVMikFpRc&list=PLwdnzlV3ogoXaccHrrFVZCJkbm_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>
- Learning Material for deep Learning
<https://coursera.org/specializations/deep-learning>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks:	100 Marks
Continuous Internal Assessment (CIA):	30 Marks
End Semester Exam (ESE):	70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section - A & B Section A: Q1. Objective - 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts..1 out of 2 from each unit-4x10=40 Marks	
Name and Signature of Convener & Members of CBOs:		
Dr. H.S. Hekel Chairman	 Anur	 Gopal
 Sushil	 Anur (Deputy Chairman)	 Anur
 Shilpa	 Anur	 Anur
 Anur	 Anur	 Anur
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ANJETA KUDUR

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor of Computer Application (Certificate / Diploma / Degree)		Semester - V	Session: 2024-2025
1	Course Code	CASC-15P	
2	Course Title	Lab 10: Machine Learning	
3	Course Type	Practical	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of course, Students will be able to: <ul style="list-style-type: none"> • 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. 	
6	Credit Value	1 Credits	Credit =30 Hours Laboratory or Field Learning/Training
7	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	<ol style="list-style-type: none"> 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.

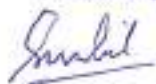
11. Implement a classification/ logistic regression problem. For example based on different features of students data, classify, whether a student is suitable for a particular activity. Based on the available dataset, a student can also implement another classification problem like checking whether an 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.

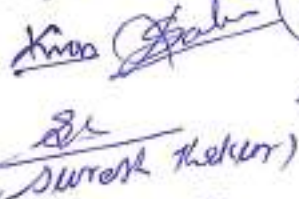
Note: List of experiments may be changed by the concerned teacher.

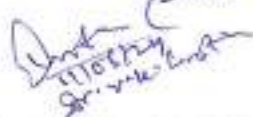
Keywords Artificial Intelligence (AI), Linear Regression, Logistic Regression, Artificial Neural Network (ANN).

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hora
Chairman




K. Suresh Kumar


Dr. V.K. Gupta


Dr. Anjeeta Kulkarni


ANJEETA KULKARNI


J.M. Laxmi


J.M. Laxmi

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 shaley-shwartz, shai ben-david, Cambridge University press.
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- 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
 - <http://www.jnit.org/wp-content/uploads/2020/04/Machine-Learning-Lab-Manual.pdf>
 - <https://nthu-datalab.github.io/ml/>
 - <https://www.deeplearning.ai/courses/>
 - [https://www.jnec.org/labmanuals/cse/te/sem1/Machine%20Learning%20LAB%20MANUAL%20\(1\).pdf](https://www.jnec.org/labmanuals/cse/te/sem1/Machine%20Learning%20LAB%20MANUAL%20(1).pdf)
 - <https://deepakdvallur.weebly.com/machine-learning-laboratory.html>

- o <https://copyassignment.com/machine-learning-a-gentle-introduction/>
- Introduction to Artificial Intelligence:
 - o <https://www.youtube.com/watch?v=pKeVMlkFpRc&list=PLwldnzIV3ogoXaceHrrFYZCJkbnJaSHcH&index=2>
 - o http://www.hpc.iitkgp.ac.in/pdfs/AI_HPC.pdf
 - o https://www.tensorflow.org/resources/learn-ml?gclid=CjwKCAjwISWBhBkEiwAdqxb9hlji5hncF0Cq2Fgy_JEWiD_uZbxtetr_BFUF_QztAELk8d2q3P_BoCodMQAvD_BwE
 - o <https://www.edx.org/professional-certificate/deep-learning>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks
 Continuous Internal Assessment (CIA): 15 Marks
 End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10	Better marks out of the two Test / Quiz. + obtained marks in Assignment shall be considered against 15 Marks
	Assignment/Seminar + Attendance - 05 Total Marks - 15	
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment	Managed by Course teacher as per lab. status
	A. Performed the Task based on lab. work - 20 Marks B. Spitting based on tools & technology (written) - 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	

Name and Signature of Convener & Members of CBoS:

Dr. H. S. Hota
Chairman

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 ANJETA KUTOR

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester - VI	Session: 2024-2025
1	Course Code	CASC-16	
2	Course Title	Data Communication and Computer Networking	
3	Course Type	DSC (Discipline Specific Course)	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the fundamentals and functionalities of computer network technology. • Understand and explain the Data Communications System and its components. • Analyze the different types of network topologies and protocols. • Analyze various layers of OSI and TCP/IP models. • Explore wireless and wired LANs. 	
6	Credit Value	4 Credits	Credit = 15 Hours - learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART -B: 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 Computer Network and Physical Layer: Fundamentals of Computer network, types of computer networks: LAN, MAN, WAN, Network topologies, Transmission modes, ISO-OSI reference model, TCP/IP model, Concept of Analog and Digital Signals, Bandwidth, Multiplexing: TDM, FDM, WDM, CDMA, Transmission Media -Guided, Unguided, switching techniques: Circuit Switching, Message Switching, Packet Switching. Common Network Architecture: Wireless LANs 802.11 standards, Overview of VSAT and VPN.	15
II	Data Link Layer: Functions of Data Link Layer, Framing, Error detection and correction codes: checksum, CRC, hamming code, Flow Control: Stop & Wait and Sliding Window Protocols, Error Control: Stop & wait ARQ, Go-back-n, Selective Repeat ARQ, Data link protocols: HDLC and PPP, Medium Access Sublayer: LLC Protocol, IEEE Project 802 series of network standard and CSMA/CD.	15
III	Network Layer and Transport Layer: Functions of Network Layer, Routing Protocols & Algorithms, IPv4, IPv6, X.25, Networking & Internetworking devices, Functions of Transport Layer, Flow Control & Buffering, Transport Layer Protocols: TCP, UDP & SCTP, Network and Principles of Congestion Control.	15
IV	Session Layer: Overview, functioning and protocols. Presentation Layer: functioning and protocols. Application Layer: BOOTP, DHCP, DNS, TELNET, World Wide Web (WWW), File Transfer Protocol (FTP), Hypertext Transfer Protocol (HTTP), Email Protocols: MIME & SMTP, POP, IMAP, Proxy Server.	15

Keywords: Protocol, Topology, Transmission Media, LAN, WAN, MAN, Wi-Fi.

Name and Signature of Convener & Members of CBaS:

ANJEETA KUJUR

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Andrew S. Tanenbaum, Computer Networks, PHI / Pearson Education Inc.
- Behrouz A. Forouzan, Data Communication and Networking, Tata McGraw-Hill.

Reference Books Recommended:

- William Stallings, Data and Computer Communication, Pearson Education.
- Nader F. Mir, Computer and Communication Networks, Pearson Education, 2007.
- Black, Data & Computer Communication, PHI

Online Resources:

- NPTEL link for Data Communication:
<https://nptel.ac.in/courses/106105082>
- Introduction to Data Communication from SWAYAM Portal
https://www.youtube.com/watch?v=swtH_okidQc&list=PLUtlVcb-iqn8dG1-Cn7NTEdILR3hRVgcN&index=1
- Layered Architecture
<https://www.youtube.com/watch?v=xHO6LjSHco0&list=PLUtlVcb-iqn8dG1-Cn7NTEdILR3hRVgcN&index=2>
- Data and Signal
<https://www.youtube.com/watch?v=6ZGVZ7gUccE&list=PLUtlVcb-iqn8dG1-Cn7NTEdILR3hRVgcN&index=3>
- Guided Transmission Media
<https://www.youtube.com/watch?v=y7v3EAsWXA&list=PLUtlVcb-iqn8dG1-Cn7NTEdILR3hRVgcN&index=5>
- Unguided Transmission Media
<https://www.youtube.com/watch?v=hKqItYIVxdQ&list=PLUtlVcb-iqn8dG1-Cn7NTEdILR3hRVgcN&index=6>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 + 20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
	Total Marks - 30	

End Semester Exam (ESE):	Two section - A & B
	Section A: Q1. Objective - 10 x1= 10 Mark: Q2. Short answer type- 5x4 =20 Marks
	Section B: Descriptive answer type qts., 1out of 2 from each unit-4x10=40 Marks

Name and Signature of Convener & Members of CBoS:

Dr. H. S. Moha
Chairman

Dr. V. K. Gupta

Dr. Suresh Kumar

Dr. Shalendra Singh

Dr. Anil

Dr. Anil

Dr. Anil

Dr. Anil

Dr. Anil

Dr. Anil

ANJETA KUMAR

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction

Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester - VI	Session: 2024-2025
1	Course Code	CASC-17T	
2	Course Title	Advanced Java	
3	Course Type	DSC (Discipline Specific Course)	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the concepts underlying technologies in JAVA. • Work with Swings and multithreading. • Configuring Apache tomcat server. • Understand the concept of JSP. • Understand the concepts underlying client-server communication. 	
6	Credit Value	3 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART -B: 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	Java Servlet: Introduction to Java Servlet, Java Servlet Life Cycle, Java Servlet API, Java Servlet Interface, Introduction to JSP, Advantages of JSP overview Servlet, JSP Life Cycle, JSP API, JSP MVC Architecture, JSP Scripting Tag, JSP Implicit Object, JSP Directive Elements, JSP Action Elements, JSP Exception Handling, Simple JSP Web Application Development.	12
II	Spring Framework: Introduction to Spring MVC Framework, Spring Modules, Development IDE (Eclipse, NetBeans, Spring Tool Suite), Spring Dependency Injection, Spring ORM, Introduction to Spring boot, Spring JPA(Hibernate), Hibernate Log4j, Hibernate Mapping.	12
III	Java Web Services: Introduction to Web Services, Web Services Architecture, Web Services Components: (SOAP, RESTful), RESTful Webservices with Spring Boot, initializing a RESTful Web Services Project with Spring Boot, Connection RESTful Webservices with Hibernate.	12
IV	Java Enterprise Application and Networking: What is EJB, Need of EJB, EJB Architecture, EJB Session Bean, EJB Entity bean, Introduction to Socket Programming, Socket API, Socket Server, Socket Client, Messaging Passing between Socket Client and Socket Server.	14

Keywords: Socket, JDBC, Servlet, Java Server page (JSP), Hibe

Name and Signature of Convener & Members of CBAs:

Dr. H.S. Hota
Chairman

(Signature)
Dr. H.S. Hota

(Signature)
Suresh Thakur

(Signature)
Suresh Thakur

(Signature)
Anshu

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ANJETA KUMAR

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester - VI	Session: 2024-2025
1	Course Code	CASC-17P	
2	Course Title	Lab 11: Advanced Java	
3	Course Type	Practical	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the concepts underlying technologies in JAVA. • Work with Swings and multithreading. • Configuring Apache tomcat server. • Understand the concept of JSP. • Understand the concepts underlying client-server communication. 	
6	Credit Value	1 Credits	Credit =30 Hours Laboratory or Field Learning/Training
7	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.	<ol style="list-style-type: none"> 1. Program to demonstrate Swing components. 2. Program to implement Address Book using Swing components. 3. Program to demonstrate loading of file in an Swing Component. 4. Multithreading program, one of the threads print a....z and other thread print 1...26. 5. Example: 1a2b3c.... 26z. 6. Multithreading program to schedule two jobs. 7. Client Server Socket Programming. 8. Server Socket which receives data from a java client program using JSON 9. Program to fetch a particular Website tags when an URL is specified. 10. Implement stack, queue, hashmap, hashtable, enumeration, ArrayList. 11. Create a table from a java program. 12. Update a table from a java program. 13. Load a table data in Swing components. 14. Delete a record from a table, drop table from a java file. 15. Program which shows use of Statement, Prepared Statement and Callable Statement. 16. Configure Apache Tomcat and write a hello world jsp page. 17. Configure Apache Tomcat server to deploy Servlets. 18. Exceptional handling in a JSP page. 19. Create a login page and authenticate a user in a JSP page using database. 		30

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Deitel&Deitel, "Java How to program", Prentice Hall, 4 th Edition, 2000.
- Gary Cornell and Cay S. Horstmann, "Core Java Vol 1 and Vol 2", Sun Microsystems Press, 1999.
- Stephen Asbury, Scott R. Weiner, Wiley, "Developing Java Enterprise Applications", 1998.

Reference Books Recommended:

- Steven Holzner, Java2, Swing, Servlets, JDBC and JAVA Beans Programming Black Book Dreamtech press
- Herbert Schildt, The Complete Reference JAVA, Tata McGraw Hill publication, 5th Edition.
- Gajendra Gupta, Advance JAVA, Firewall Media, 1st Edition, 2006.
- Elliotte Rusty Harold, JAVA network programming, O'Reilly Publication, 3rd Edition.
- Bruce W. Perry, Java Servlet and JSP Cookbook, O'Reilly Publication, 1st Edition.
- Andrew Lee Rubinger and Bill Burke, Enterprise JAVA beans 3.1, O'Reilly Publication, 6th Edition.
- Sue Spielman, The Struts Frameworks: Practical guide for Java Programmers, Murgan Kaufmann publisher.
- Chuck Cavaness, Programming Jakarta Struts, O'Reilly Publication, 1st Edition.
- K.Santosh Kumar, Spring and Hibernate, McGraw Hill Education (India) Pvt. Limited, 2nd edition.
- John Dean, Raymond Dean, Introduction to Programming with JAVA – A Problem Solving Approach, Tata Mc Graw Hill.
- Core and Advanced JAVA (Black Book), Dreamtech Press.
- Justin Edelson, Brett McLaughlin, JAVA and XML: Solutions to real world problem, O'Reilly Publication, 6th Edition.
- Rashmi Kanta Das, Core Java for Beginners, Vikas Publishing House Pvt. Ltd.
- David Flanagan, JAVA in a Nutshell, O'Reilly Publication, 5th Edition.
- Patrik Niemeyer and Jonathan Knudsen, Learning JAVA, O'Reilly Publication, 3rd edition.

Online Resources:

- Tutorials:
 - <https://www.edureka.co/blog/advanced-java-tutorial>
 - <https://www.javatpoint.com/what-is-advance-java>
 - <https://www.w3schools.in/java>
 - <https://www.tutorialspoint.com/java/index.htm>
 - <https://www.jigsawacademy.com/blogs/tutorial/advanced-java>
 - <https://enos.itcollege.ee/~jpoial/allalaadimised/reading/Advanced-java.pdf>
- Lab manuals:
 - <https://www.gacwrmn.in/learning/Computer/7MCE1P1-Advanced%20Java%20Programming%20Lab.pdf>
 - http://genindia.dronacharya.info/ECS/Downloads/Labmanuals/V-Sem/LM_Ad_Java.pdf
 - https://genindia.dronacharya.info/CSE/Downloads/Labmanuals/Aug09-Dec09/CSE%20&%20IT/VII%20Sem/Adv_Java_LAB_MANNUAL_VIISem.pdf
 - <http://oseven.in/files/591337cbc6177.pdf>
 - https://www.arsdcollege.ac.in/wp-content/uploads/2020/05/Programming_in_Java_-_week9.pdf

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
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End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) - 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status
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Name and Signature of Convener & Members of CBoS:

Dr. H.S. More
Chairman

[Signature]

[Signature]
Suresh Thakur

[Signature]
Shailendra Agri

[Signature]
ANJEETA KUMAR

[Signature]
JMP

[Signature]
Technician

[Signature]

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester - VI	Session: 2024-2025
1	Course Code	CASC-18	
2	Course Title	Major Project-I	
3	Course Type	DSC (Discipline Specific Course)	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • 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. 	
6	Credit Value	4 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART -B: 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: <ol style="list-style-type: none"> 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 <ol style="list-style-type: none"> 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

PART-C: Learning Resources

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=tTBITZUdivHpNzIH>
- NPTEL YouTube Channel: Software Engineering Lecture Series https://youtube.com/playlist?list=PL8751DA481F0F0D17&si=071FYV7GP8_oelxZ

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

End Semester Exam (ESE): 100 Marks

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

Kiran
(Bhuresh Thakur)
Dr. V.K. Swaraj
Shailendra Agn

Brahm
Ananta
ANJEETA KUMAR
Akh
Suresh
Ananta
Suresh
Ananta

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester - VII	Session: 2024-2025
1	Course Code	CASC-19T	
2	Course Title	Mobile Application Development	
3	Course Type	DSC (Discipline Specific Course)	
4	Pre-requisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Apply general programming knowledge in the field of developing mobile applications. • Develop and deploy mobile applications into different hosting services. • Interact between user interface and underlying application. • Understand the full life cycle development of mobile apps. • Plan and carry out design work including developing a prototype that can be evaluated with a specified user group. 	
6	Credit Value	3 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART -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 to Mobile Applications: History of Android, Android Features, Android Versions, Fundamentals: Basic Building blocks, Activities, Intents, Services, Broadcast Receivers, Intent Filters and Activity Stack. Android Development: Development IDE: Android Studio, Eclipse; Android Virtualization Framework, Creating Android Virtual Device (AVD), System Images in AVD, creating a Hardware Profile in AVD, Creating an Emulator Skin, Creating and Running a Simple Hello World Program.	12
II	Basic UI Design: Styles & Themes, Form widgets, Text Fields, Layouts: Relative Layout Table Layout, Frame Layout, Linear Layout, Nested layouts (dip, dp, sip, sp versus px), styles.xml, Drawable Resources for Shapes, gradients (selectors), Style attribute in the Layout File, Alert Dialogs & Toast, Time and Date, Images and media.	11
III	Android Interface: View and Notifications: creation and display; Menus: Options menu, Context menu, Pop-up Menu; Input Controls: Buttons, Text Fields, Checkboxes, Alert Dialogs, Spinners, Rating bar, Progress bar, Android Threads and Thread Handlers, Content Providers, Android File System, and Databases (SQLite, Firebase).	11
IV	Messaging and Location-Based Services: Sending SMS Messages Programmatically, Getting Feedback After Sending the Message, Receiving and Sending Email, Introduction to Location-based service, Configuring an Android Emulator for Location-Based Services, Geocoding and Map-Based Activities, Different Types of Permission in Android, Android Connectivity, Different types of Sensors, Android App Testing, Android App Deployment.	11
Keywords	Android Studio, Eclipse, Virtualization, Debugging, Android Layout, Android UI Design, Android Menus, Toast, Spinners, Threads, Geocoding, Sensor, Android Connectivity, Android App Testing.	

Name and Signature of Convener & Members of CBaS:

Dr. H.S. Hota
 Chairman







(Suresh Thakur)
 Dr. V.K. Gupta
 Anjeeta Kumar
 Anjeeta Kumar

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Bill Phillips, Chris Stewart, Brian Hardy, and Kristin Marsicano, Android Programming: The Big Nerd Ranch Guide, Big Nerd Ranch LLC, 3rd edition, 2017.
- John Horton, Android Programming for Beginners - Second Edition, Packt Publishing
- Neil Smyth, Android Studio 3.0 Development Essentials: Android 8 Edition, Amazon Digital Services

Reference Books Recommended:

- Rajiv Ramnath, Roger Crawfis, and Paolo Sivilotti, Android SDK 3 for Dummies, Wiley.
- Michael Burton Android App Development for Dummies, 3ed, Wiley publication.

Online Resources:

- Android from SWAYAM/NPTEL- <https://nptel.ac.in/courses/106106147>
- Android from Tutorialspoint - https://www.tutorialspoint.com/android/android_overview.htm
- Android Studio from JavaTPoint - <https://www.javatpoint.com/android-tutorial>
- Android App Development - <https://developer.android.com/guide>
- Android Application Development - Udemy- <https://www.udemy.com/course/learn-android-application-development-y//>
- Android Application Development - Coursera - <https://www.coursera.org/specializations/android-app-development>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
	Total Marks - 30	

End Semester Exam (ESE):	Two section - A & B Section A: Q1. Objective - 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts., 1out of 2 from each unit-4x10=40 Marks
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Name and Signature of Convener & Members of CBoS:

Dr. H.S. Datta
Chairman

(Suresh Thakur)

ANJETA KOJUR

Other members' signatures: [Handwritten signatures]

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application <i>(Certificate / Diploma / Degree)</i>		Semester - VII	Session: 2024-2025
1	Course Code	CASC-19P	
2	Course Title	LAB 12: Mobile Application Development	
3	Course Type	Practical	
4	Pre-requisite	<i>As per program</i>	
5	Course Learning Outcomes (CLO)	<p>At the end of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Apply general programming knowledge in the field of developing mobile applications. • Design and develop an Android app for different real-time activities and purposes. • Develop and deploy mobile applications into different hosting services. • Understand the specific requirements, possibilities, and challenges when developing for a mobile context. • Interact between user interface and underlying application. • Understand the full life cycle development of mobile apps. • Plan and carry out design work including developing a prototype that can be evaluated with a specified user group. • Reflect on possibilities and demands in collaborative software development. 	
6	Credit Value	1 Credits	<i>Credit =30 Hours Laboratory or Field Learning/Training</i>
7	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
Lab./Field Training/ Experiment Contents of Course	<ol style="list-style-type: none"> 1. Create "Hello World" application that will display "Hello World" in the middle of the screen in the red color with white background. 2. Create Custom Toast & Dialog Box. 3. Design an application that contains phone contacts in vertical linear manner. Selected contact appears at the top of the list with a large italicized font and a blue background. 4. Create an application that uses Layout Managers and Event Listeners. 5. Develop a standard calculator application to perform basic calculations like addition, subtraction, multiplication and division. 6. Design an application to draws basic graphical primitives (rectangle, circle) on the screen. 7. Design an android application Using Radio buttons. 8. Create a user registration application that stores the user details in a database table. 9. Build a mobile application that create, save, update and delete data in database. 10. Create an application that takes the name from a text box and shows hello message along with the name entered in text box, when the user clicks the OK button. 11. Devise an application that implements Multithreading. 12. Develop a mobile application that uses GPS location information. 		30

13. Create an application that writes data to the SD card.
14. Implement an application that creates an alert upon receiving message.
15. Design a mobile application that creates alarm clock.
16. Create a screen that has input boxes for User Name, Password, Address, Gender (radio buttons for male and female), Age (numeric) and a Submit button. On clicking the submit button, print all the data below the Submit Button (use any layout).
17. Design an android application to create page using Intent and one Button and pass the Values from one Activity to second Activity.
18. Design an android application send SMS using Intent.
19. Create an android application using Fragments.
20. Design an android application for menu.

Note: This is a tentative list; the teachers' concern can add more program as per requirement.

Keywords *Android, Eclipse, Virtualization, Debugging, Toast, Spinners, Threads, Geocoding, Doodlz.*

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

Dr. H.S. Hota

(Signature)

Dr. H.S. Hota

(Signature)

(Signature)

(Signature)

Suresh Thakur

ANJETA KUMAR

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(Signature)

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Bill Phillips, Chris Stewart, Brian Hardy, and Kristin Marsicano, Android Programming: The Big Nerd Ranch Guide, Big Nerd Ranch LLC, 3rd edition, 2017.
- John Horton, Android Programming for Beginners - Second Edition, Packt Publishing
- Neil Smyth, Android Studio 3.0 Development Essentials: Android 8 Edition, Amazon Digital Services

Reference Books Recommended:

- Rajiv Ramnath, Roger Crawfis, and Paolo Sivillotti, Android SDK 3 for Dummies, Wiley.
- Michael Burton Android App Development for Dummies, 3ed, Wiley publication.

Online Resources:

- Android from SWAYAM/NPTEL: <https://nptel.ac.in/courses/106106147>
- Android from tutorialspoint: https://www.tutorialspoint.com/android/android_overview.htm
- Android Studio from Javatpoint: <https://www.javatpoint.com/android-tutorial>
- Android App Development: <https://developer.android.com/guide>
- Android Application Development - Udemy: <https://www.udemy.com/course/learn-android-application-development-v/>
- Android Application Development - Coursera: <https://www.coursera.org/specializations/android-app-development>
- Lab manuals:
 - <https://pesitsouth.pes.edu/pdf/2019/July/MCA/android%20Lab%20manual.pdf>
 - <https://mrcet.com/pdf/Lab%20Manuals/MOBILE%20APPLICATION%20DEVELOPMENT%20LAB.pdf>
 - <https://www.vvitengineering.com/lab/CS6611-MOBILE-APPLICATION-DEVELOPMENT-LABORATORY.pdf>
 - <http://www.jnit.org/wp-content/uploads/2020/04/SDL-II-android.pdf>

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor of Computer Application (Certificate / Diploma / Degree/Honors)		Semester - VIII	Session: 2024-2025
1	Course Code	CASC-20T	
2	Course Title	Fundamentals of IoT and Applications	
3	Course Type	DSC (Discipline Specific Course)	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand IoT value chain structure (device, data cloud), application areas and technologies involved. • Understand working of sensors. • Understand about technological challenges faced by IoT devices, with a focus on wireless, energy, power, and sensing modules • Market forecast for IoT devices with a focus on sensors • Explore and learn about Internet of Things with the help of preparing projects designed for Raspberry Pi. 	
6	Credit Value	3 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART -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 to Internet of Things- Definition and Characteristics of IoT, Sensors, Actuators, Physical Design of IoT – IoT Protocols, IoT communication models, IoT Communication APIs, IoT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Embedded Systems, IoT Levels and Templates, Domain Specific IoTs – Home, City, Environment, Energy, Agriculture and Industry.	13
II	IoT Physical Devices - Introduction to Arduino and Raspberry Pi- Installation, Interfaces (serial, SPI, I2C). Controlling Hardware- Connecting LED, Buzzer, Switching High Power devices with transistors, Controlling AC Power devices with Relays, Controlling servo motor, speed control of DC Motor, unipolar and bipolar Stepper motors.	11
III	Sensors- Light sensor, temperature sensor with thermistor, voltage sensor, ADC and DAC, Temperature and Humidity Sensor DHT11, Motion Detection Sensors, Wireless Bluetooth Sensors, Level Sensors, USB Sensors, Embedded Sensors, Distance Measurement with ultrasound sensor.	10
IV	Applications of IoT: Home Automation, Smart Cities, Energy, Retail Management, Logistics, Agriculture, Health and Lifestyle, Industrial IoT, Legal challenges, IoT design Ethics, IoT in Environmental Protection.	11

Keywords: Internet of Things, IOT Sensors, IOT Actuators, Arduino, Raspberry Pi.

Name and Signature of Convener & Members of CBA:

Dr. H.S. Hora
 Chairman











 ANJEEETA RANA

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547
- Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759
- Raspberry Pi Cookbook, Software and Hardware Problems and solutions, Simon Monk, O'Reilly (SPD), 2016, ISBN 9789352133895

Reference Books Recommended:

- Peter Waher, 'Learning Internet of Things', Packt Publishing, 2015 3. Editors Ovidiu Vermesan
- Peter Friess, 'Internet of Things – From Research and Innovation to Market Deployment', River Publishers, 2014
- N. Ida, Sensors, Actuators and Their Interfaces, SciTech Publishers, 2014.

Online Resources:

- Swayam/NPTEL: https://www.youtube.com/channel/UC6ZY_csXZc7YZZm2W8HcQ6A
- Javatpoint: <https://www.javatpoint.com/iot-internet-of-things>
- Tutorialspoint: https://www.tutorialspoint.com/internet_of_things/index.htm
- Topics Related to IOT from data-flair: <https://data-flair.training/blogs/iot-tutorial/>
- Topics Related to IOT from edureka: <https://www.edureka.co/blog/iot-tutorial/>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
	Total Marks - 30	

End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit-4x10=40 Marks
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Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

King Singh

Sunil

Dr. V.K. Gupta

Suresh Thakur

Shankar Singh

Pradip

Anjeeta Kujur

Chh

Pradip

Dr. Sunil

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor of Computer Application <i>(Certificate / Diploma / Degree)</i>		Semester - VIII	Session: 2024-2025
1	Course Code	CASC-20P	
2	Course Title	Lab 14: Fundamentals of IoT and Applications	
3	Course Type	Practical	
4	Prerequisite	<i>As per program</i>	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand IoT value chain structure (device, data cloud), application areas and technologies involved. • Understand working of IoT sensors. • Understand IoT sensors and technological challenges faced by IoT devices, with a focus on wireless, energy, power, and sensing modules • Market forecast for IoT devices with a focus on sensors • Explore and learn about Internet of Things with the help of preparing projects designed for Raspberry Pi. 	
6	Credit Value	1 Credits	<i>Credit =30 Hours Laboratory or Field Learning/Training</i>
7	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 Experiment	<ol style="list-style-type: none"> 1. Data acquisition using Multimeter and oscillographic recorder 2. Connect an LED to GPIO pin 25 and control it through the command line. 3. Connect an LED to GPIO pin 24 and a Switch to GPIO 25 and control the LED with the switch. 4. The state of LED should toggle with every press of the switch Use DHT11 temperature sensor and print the temperature and humidity of the room with an interval of 15 seconds 5. Use joystick and display the direction on the screen 6. Use Light Dependent Resistor (LDR) and control an LED that should switch-on/off depending on the light. 7. Create a traffic light signal with three colored lights (Red, Orange and Green) with a duty cycle of 5-2-10 seconds. 8. Switch on and switch of a DC motor based on the position of a switch. 9. Convert an analog voltage to digital value and show it on the screen. 10. Create a door lock application using a reed switch and magnet and give a beep when the door is opened. 11. Control a 230V device (Bulb) with Raspberry Pi using a relay. 12. Control a 230V device using a threshold temperature, using a temperature sensor. 13. Create an application that has three LEDs (Red, Green and white). The LEDs should follow the cycle (All Off, Red On, Green On, and White On) for each clap (use sound sensor). 14. Create a web application for the above applications wherever possible with suitable modifications to get input and to send output. 		30
Note: Concerned teacher can add additional experiments as per requirement			

Keywords Internet of Things, IOT Sensors, IOT Actuators, Arduino, Raspberry Pi.

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

Subodh

Dr. V.K. Borkar

Kiran
(Suresh Thakur)

Shailendra Arora

Anjeeta Kumar

Y.M. Gaur

Dr. Tejendra Kumar

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547
- Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759
- Raspberry Pi Cookbook, Software and Hardware Problems and solutions, Simon Monk, O'Reilly (SPD), 2016, ISBN 7989352133895

Reference Books Recommended:

- Peter Waher, 'Learning Internet of Things', Packt Publishing, 2015 3. Editors Ovidiu Vermesan
- Peter Friess, 'Internet of Things - From Research and Innovation to Market Deployment', River Publishers, 2014
- N. Ida, Sensors, Actuators and Their Interfaces, SciTech Publishers, 2014.

Online Resources:

- Swayam/NPTEL: https://www.youtube.com/channel/UC6ZY_csXZc7YZZm2W8HcQ6A
- Javatpoint: <https://www.javatpoint.com/iot-internet-of-things>
- Tutorialspoint: https://www.tutorialspoint.com/internet_of_things/index.htm
- Topics Related to IOT from data-flair: <https://data-flair.training/blogs/iot-tutorial/>
- Topics Related to IOT from edureka: <https://www.edureka.co/blog/iot-tutorial/>
- Lab Manuals:
 - o https://www.lnmiit.ac.in/Department/ECE/uploaded_files/Internet_of_Things_Lab_manual.pdf
 - o https://www.iare.ac.in/sites/default/files/lab1/IARE_IOT%20LAB%20MANUAL.pdf
 - o https://www.amirajcollege.in/wp-content/uploads/2020/06/2180709-iot_manual.pdf
 - o <https://peer.asee.org/internet-of-things-iot-laboratory.pdf>
 - o <https://www.teachmint.com/tfile/studymaterial/class-7th/internetofthingsiot/iotlabmanualpdf/d85015cf-722b-4b50-86e4-0f456f91bfa0>
 - o <https://www.slideshare.net/RadheyShyam18/iot-lab-manual-new>
 - o <https://www.psrkcw.ac.in/wp-content/uploads/2021/08/loT-Applications-Lab-Manual-IT.pdf>
 - o <https://www.coursehero.com/file/37028140/loT-Lab-Manualpdf/>
 - o <https://www.scribd.com/document/408744059/loT-Lab-Manual>
 - o https://mrcet.com/CSE_downloads.html
 - o <http://iotmumbai.bharativedyapeeth.edu/index.php/lab-manuals#computer-technology>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

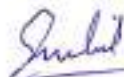
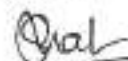
Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

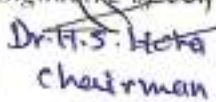


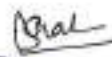


End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10	Better marks out of the two Test / Quiz * obtained marks in Assignment shall be considered against 15 Marks
	Assignment/Seminar +Attendance - 05 Total Marks - 15	
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment	Managed by Course teacher as per lab. status
	A. Performed the Task based on lab. work - 20 Marks	
	B. Spotting based on tools & technology (written) - 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	

Name and Signature of Convener & Members of CBoS:

Dr H.S. Moha
Chairman
Dr. H.S. Moha
Dr. H.S. Moha
Dr. H.S. Moha
ANJETA KAJUR
Dr. H.S. Moha
Dr. H.S. Moha
Dr. H.S. Moha

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester – III	Session: 2024-2025
1	Course Code	CASE-01	
2	Course Title	Cyber Security and Cyber Law	
3	Course Type	DSE (Discipline Specific Elective)	
4	Prerequisite	As per Program	
5	Course Learning Outcomes(CLO)	At the end of this course, students will be able to: <ul style="list-style-type: none"> • Understand the fundamental concepts in cyber security and distinguish among the attacks, threats and vulnerabilities. • Identify, differentiate and explain different cyber crimes and frauds. • Understand the concept of Cyber security issues and challenges associated with it. • Understand the cyber crimes, their nature, legal remedies and how to report the crimes through available platforms and procedures. • Understand the basic concepts related to E-Commerce and digital payments. 	
6	Credit Value	4 Credits	Credit = 15 Hours -Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART – 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
Keywords	Cyberspace, Cybercrime, Cyber security, Physical System security, Ransomware, Modus-operandi, Authentication, Vulnerability, Intrusion Detection and Prevention, Cyber Law.		
Signature of Convener & Members of CBAS:			
<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  Dr. H. S. Hota Chairman </div> <div style="text-align: center;">  Anshu Kumar </div> <div style="text-align: center;">  Shri. Lakshmi Prasad </div> <div style="text-align: center;">  Anurag </div> <div style="text-align: center;">  Anil </div> <div style="text-align: center;">  Anshu </div> <div style="text-align: center;">  Anshu </div> <div style="text-align: center;">  Anshu </div> </div>			
 ANSHEKA KUMAR			

PART-C: Learning Resources

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, Author 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/ccc21_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-obook.pdf>
- Cyber Criminology by K. Jaishankar: <https://larose.staff.ub.ac.id/files/2011/12/Cyber-Criminology-Exploring-Internet-Crimes-and-Criminal-Behavior.pdf>
- Fundamentals 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>

PART-D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment(CIA): 30 Marks

End Semester Exam(ESE): 70 Marks

Continuous Internal Assessment(CIA): (By Course Teacher)	Internal Test / Quiz- (2): 20 & 20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks.
	Assignment/Seminar- 10	
	Total Marks - 30	

End Semester Exam (ESE):	Two section – A & B
	Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4=20 Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit-4x10=40 Marks

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

Kumar

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ANJEEVA KUMAR

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester – IV	Session: 2024-2025
1	Course Code	CASE-02	
2	Course Title	Artificial Intelligence and Expert System	
3	Course Type	DSE (Discipline Specific Elective)	
4	Prerequisite	As per program	
5	Course Learning Outcomes(CLO)	At the end of the course, students will be able to: <ul style="list-style-type: none"> • Understand the Basics about Artificial Intelligence and Expert Systems. • Understand the Programming Logics in Artificial Intelligence. • Understand various search methods in Artificial Intelligence. • Understand the Knowledge about the Expert Systems. • Understand the latest developments in Knowledge systems and Tools. 	
6	Credit Value	4 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART – B: 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: History, Definition of AI, Emulation of human cognitive process, knowledge search trade off, stored knowledge, semantic nets. An abstract view of modelling, elementary knowledge. Computational logic, analysis of compound statements using simple logic connectives, predicate logic, knowledge organization and manipulation, knowledge acquisition.	15
II	AI Programming languages: LISP and other programming languages- introduction to LISP, syntax and numerical function, LISP and PROLOG distinction, input output and local variables, Interaction and recursion, property list and arrays alternative languages, formalized symbolic logics- properties of WFRS, non-deductive inference methods. Inconsistencies and uncertainties- Truth maintenance systems, default reasoning and closed world assumption, Model and temporary logic.	15
III	Problems and Heuristic Search Techniques: Problem Characteristics, Production Systems, Control Strategies, Search techniques: Breadth First, Depth-first search, Hill-climbing, Heuristics Search Techniques: Best First Search, A* algorithm. Knowledge Representation: Approaches and Issues, Frame, Conceptual dependency, Semantic Net, Scripts etc., Propositional Logic, First order, Propositional Logic (FOPL), Conversion to clausal form, Inference rules, Resolution principal.	15
IV	Expert System: Introduction, Application, Existing Expert systems, Components of typical expert system, Rule based system architecture. Pattern Recognition: Pattern recognition system- understanding speech recognition, Image transformation, low level processing, medium and high level processing, vision system architecture.	15
Keywords	Artificial Intelligence (AI), AI Agent, State Space, Production System, LISP, PROLOG, Knowledge Representation, Semantic Net, Propositional Logic, Expert System.	

Name and Signature of Convener & Members of CBoS:

Dr. H. S. Hota
Chairman

[Signature]
Suresh Kulkarni

[Signature]

[Signature]
Srinivas Prasad

[Signature]
Jyoti Kulkarni

[Signature]
Jyoti Kulkarni

[Signature]
ANJEEA KURU

[Signature]

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Dan W. Patterson, Introduction to Artificial Intelligence and Expert Systems, PHI Publication.
- Elaine Rich and Kevin Knight, Artificial Intelligence, TMH publication.
- George. F, William. A. Stubblefield, 'Artificial intelligence and the design of expert systems', The Benjamin Cummins Publishing Co., Inc 2nd Edition, 1992.
- V.S. Jankiraman, K. Sarukesi and P. Gopala krishnan, Foundations of Artificial Intelligence and Expert Systems , Macmillan Series in Computer Science.

Reference Books Recommended:

- Vinod Chandra S.S., Anand Hareendrn S., Artificial Intelligence and machine learning, PHI learning private Ltd.
- V.S. Jankiraman, K. Sarukesi and P. Gopala Krishnan, Foundations of Artificial Intelligence and Expert Systems, Macmillan Series in Computer Science
- Russel (Stuart), 'Artificial Intelligence- Modern approach, Pearson Education series in AI', 3rd Edition, 2009.
- Eugene Charniak, Drew Mc Dermot, 'Introduction to Artificial intelligence', Addison Wesley Longman Inc ,2009
- Robert J Schalkoff, 'Artificial intelligence An Engineering Approach', McGraw Hill International Edition, 1990

Online Resources:

- Introduction to Artificial Intelligence from SWAYAM:
https://www.youtube.com/watch?v=pKeVMlkFpRc&list=PLwdnzlV3ogoXaceHrrFVZCJkbm_laSHcH&index=2
- Artificial Intelligence: Knowledge Representation And Reasoning from SWAYAM
https://onlinecourses.nptel.ac.in/noc24_cs14/preview
- An introduction to Artificial Intelligence from SWAYAM:
https://onlinecourses.nptel.ac.in/noc24_cs08/preview
- Introduction to Artificial Intelligence from Coursera: <https://www.coursera.org/learn/introduction-to-ai>
- Problem Solving as State Space Search from SWAYAM:
https://www.youtube.com/watch?v=fLw8SfvaJWA&list=PLwdnzlV3ogoXaceHrrFVZCJkbm_laSHcH&index=3
- Heuristic Search from SWAYAM:
https://www.youtube.com/watch?v=0awSpFyh2MY&list=PLwdnzlV3ogoXaceHrrFVZCJkbm_laSHcH&index=5
- Introduction to Artificial Intelligence:
<https://www.javatpoint.com/artificial-intelligence-ai>
- How to Learn Artificial Intelligence from Coursera: <https://www.coursera.org/articles/how-to-learn-artificial-intelligence>
- What is knowledge representation:
<https://courses.csail.mit.edu/6.803/pdf/davis.pdf>
- Informed Search
https://www.youtube.com/watch?v=-Rl2hOyjZB8&list=PLwdnzlV3ogoXaceHrrFVZCJkbm_laSHcH&index=6
- Artificial; Intelligence and Expert System:
 - https://sist.sathyabama.ac.in/sist_coursematerial/
 - https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SMRA3003.pdf

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks:	100 Marks
Continuous Internal Assessment (CIA):	30 Marks
End Semester Exam (ESE):	70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 & 20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section - A & B Section A: Q1, Objective - 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit-4x10=40 Marks	

Name and Signature of Convener & Members of CBaS:

Dr. H.S. Heta
Chairman

[Signature]

[Signature]
(Suresh Heta)

[Signature]
Suresh Heta

[Signature]
11/08/24
Dr. H.S. Heta


[Signature]
G.M. Kan

[Signature]
Suresh Heta

[Signature]
Suresh Heta

[Signature]
ANJEETA KUMAR

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester -V	Session: 2024-2025
1	Course Code	CASE-03	
2	Course Title	Numerical Analysis	
3	Course Type	DSE (Discipline Specific Elective)	
4	Prerequisite	As per Program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Obtain numerical solutions of algebraic and transcendental equations. • Find out numerical solutions of system of linear equations and check the accuracy of the solutions. • Evaluating the solution of problem using various interpolating and extrapolating methods. • Solve initial and boundary value problems in differential equations using numerical methods. • Apply various numerical methods in real life problems. 	
6	Credit Value	4 Credits	Credit = 15 Hours - learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART -B: 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	Numerical Methods for Solving Algebraic and Transcendental Equations: Round-off error, Cubic and Bi-quadratic Solution: Cardon's Method, Ferrari Method, Descartes Method, Graeffe's Root Squaring, Bisection method, False position method, Fixed point iteration method, Newton's method and secant method for solving equations.		15
II	Numerical Methods for Solving Linear Systems: Determinant Method, Matrix Inversion Method, Lower and upper triangular (LU) decomposition of a matrix and its applications, Thomas method for tridiagonal systems; Gauss-Jordan, Jacobi's, Gauss-Seidel and successive over-relaxation (SOR) methods.		15
III	Interpolation: Lagrange and Newton interpolations, Piecewise linear interpolation, Cubic spline interpolation, Hermite's Interpolation, Gregory-Newton forward and backward difference interpolations. Numerical Differentiation and Integration: First order and higher order approximation for first derivative, Approximation for second derivative; Numerical integration: Trapezoidal rule, Simpson's rules and error analysis, Bulirsch-Stoer extrapolation methods, Richardson extrapolation.		15
IV	Initial and Boundary Value Problems of Differential Equations: Euler's method, Taylor's Method, Runge-Kutta methods, Predictor-Corrector, Higher order one step method, multi-step methods: Adams-Bashforth methods, Adams-Moulton methods, Finite difference method, Shooting method.		15
<i>Keywords</i> Error, Decomposition, Interpolation, Differentiation, Integration, Higher order.			
Name and Signature of Convener & Members of CBoS:			
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;"> <p>Dr H.S. Heta Chairman</p>  </div> <div style="text-align: center;"> <p></p> <p>(Secretary)</p> </div> <div style="text-align: center;"> <p></p> </div> <div style="text-align: center;"> <p></p> </div> <div style="text-align: center;"> <p></p> </div> <div style="text-align: center;"> <p></p> </div> <div style="text-align: center;"> <p></p> <p>ANJETA KUMAR</p> </div> </div>			

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Brian Bradie (2006), A Friendly Introduction to Numerical Analysis. Pearson.
- C. F. Gerald & P. O. Wheatley (2008). Applied Numerical Analysis (7th edition), Pearson Education, India.
- F. B. Hildebrand (2013). Introduction to Numerical Analysis: (2nd edition). Dover Publications.

Reference Books Recommended:

- M. K. Jain, S. R. K. Iyengar & R. K. Jain (2012). Numerical Methods for Scientific and Engineering Computation (6th edition). New Age International Publishers.
- Robert J. Schilling & Sandra L. Harris (1999). Applied Numerical Methods for Engineers Using MATLAB and C. Thomson-Brooks/Cole.
- Dr B. S. Grewal, Numerical Methods, Khanna Publications.

Online Resources:

- SWAYAM/NPTEL : Online Lecture Series on Numerical Analysis
https://onlinecourses.swayam2.ac.in/cec20_mall/preview
https://onlinecourses.nptel.ac.in/noc19_ma21/preview
- NPTEL : Online Lecture Series on Numerical Methods
<https://www.youtube.com/channel/UCqpVOOZS6-OFQaPKWBZLKJQ>
https://www.youtube.com/watch?v=TWAN_T66Cps&list=PLq-Gm0yRYwTguDcVljlZicXxzdZCAr5S

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2):	20 & 20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar -	10	
	Total Marks -	30	

End Semester Exam (ESE): Two section – A & B
Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks
Section B: Descriptive answer type qts., 1out of 2 from each unit-4x10=40 Marks

Name and Signature of Convener & Members of CBoS:

Dr. H. S. Hota
Chairman
Sundil
Kiran
Suresh Thakkar
Shrinidhi Patil
Anam
Bhal
Disha
TIBBETIAN
Dr. V. K. Gupta
JMP
Anurag
ANJEETA KUMAR
Suresh

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application <i>(Certificate / Diploma / Degree/Honors)</i>		Semester - VI	Session: 2024-2025
1	Course Code	CASE-04	
2	Course Title	Computer System Architecture	
3	Course Type	DSE (Discipline Specific Elective)	
4	Prerequisite (if, any)	<i>As per Program</i>	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the architecture and functioning of computer systems at the hardware level. • Analyze the Instruction Set Architecture (ISA) • Understand the functioning of the CPU. • Understand the concept of parallel processing with their applications. • Understand the communication between the peripheral devices and CPU. • Explore the concepts of Memory Organization. 	
6	Credit Value	4 Credits	Credit = 15 Hours - learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART -B: 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	Fundamentals Of Basic Computer Organization And Design: Introduction of digital components, register and its types(DR,AR,AC,IR,PC,TR,INPR,OUTR), register transfer and register transfer language, micro operations and its types, common bus system for register and memory organization, computer instruction, basic format of instruction, types of instruction according addressing field (zero, one, two, three addressing), types of instruction (MRI,NMRI), addressing modes, instruction cycle and its flowchart, types of control unit(hardwired and microprogrammed control unit), design of control unit in basic computer.		15
II	Central Processing Unit and Parallel Processing Techniques: Introduction to CPU, general register organization, stack organization (register stack, memory stack), application of stack organizations, CPU instructions (data transfer instruction, data manipulation instruction, program control instructions), RISC and CISC instructions, interrupts and its types, interrupt cycle. Flynn's classification of computers, Parallel processing techniques (pipeline processing, vector processing, array processing), pipeline processing concept, types of pipelines and its application, speedup ratio of a pipeline, vector processing concept and its applications, concept of array processing and its applications.		15
III	Input – Output Organization: Introduction to peripheral devices, input-output interface and its designing, Modes of data transfer (synchronous and asynchronous data transfer), controls in asynchronous data transfer (strobe control and handshaking control), modes of data transfer (programmed i/o, interrupt-initiated i/o and direct memory access), input-output processor.		15
IV	Memory Organization and Multiprocessor Architecture: Memory hierarchy, main memory and its organization (RAM and ROM Chips, memory address map, memory connections to CPU), auxiliary memory, associative memory, concept of cache memory, cache memory mapping techniques (associative mapping, direct mapping, set-associative mapping), cache coherence problem and its solution, introduction to multiprocessors, interconnection structures of multiprocessor-based systems, inter-processor communication and synchronization.		15
Keywords	<i>Registers, Micro operation, Instruction, Control Unit, Instruction Cycle, Interrupt Cycle, CPU, Stack,</i>		

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester - VII	Session: 2024-2025
1	Course Code	CASE-05	
2	Course Title	Computer Graphics	
3	Course Type	DSE (Discipline Specific Elective)	
4	Pre-requisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able: <ul style="list-style-type: none"> • Understand the basics of computer graphics, different graphics systems and applications of computer graphics. • Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis. • Use of geometric transformations on graphics objects and their application in composite form. • Extract scene with different clipping methods and its transformation to graphics display device. • Explore projections and visible surface detection techniques for display of 3D scene on 2D screen. 	
6	Credit Value	4 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART -B: 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	Basics of Computer Graphics: Applications of Computer Graphics, Input Devices: Keyboard, Mouse, Trackball & Space ball, Joystick, Data Glove, Digitizers, Image Scanners, Touch panels, Light Pens systems. Output display devices: Refresh CRT, Raster-Scan display and Random-scan display technique, Color display techniques-Beam penetration method and Shadow-mask method, Direct view storage tubes, Emissive & Non-emissive flat-panel, Displays-Plasma panels, LED and LCD monitor.	15
II	Fundamental Techniques in Graphics: Line-drawing algorithms, DDA algorithm and Bresenham's Line drawing Algorithm, Midpoint Algorithm for Circle and Ellipse Generation, Curve generation. Attributes for output primitives: Area-filling Algorithms - Scan-line Polygon-fill.	15
III	Geometrical Transformation: 2D Transformation (translation, rotation, scaling, reflection and shearing), Homogeneous Coordinates and Matrix Representation of 2D Transformations, Successive and composite 2D Transformations, the Window-to-Viewport Transformations, Introduction to 3D Transformations Matrix.	15
IV	Curves and Surfaces: Polygon Surfaces and polygon meshes, Quadratic and super quadrics surfaces, Spline curve and representation Definition of Bezier curve and its properties, Algorithms for Bezier curves and surfaces, Hermite curve.	15

Keywords Computer Graphics, Raster Scan, Random-scan, Line Drawing Algorithm, Matrix Representation

Name and Signature of Convener & Members of CBAS:

Dr. H. S. Heba
Chairman

Kris
Signature
Srinidhi PPT

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[Signature]

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PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Foley, Van Dam, Feiner, Hughes, Computer Graphics Principles & practice, 2000.
- D.J. Gibbs & D.C. Tsichritz: Multimedia programming Object Environment & Frame work, 2000.

Reference Books Recommended:

- Ralf Skinmeiz and Klana Naharstedt, Multimedia: computing, Communication and Applications, Pearson, 2001
- D. Haran & Baker. Computer Graphics Prentice Hall of India, 1986.

Online Resources:

- NPTEL: https://onlinecourses.nptel.ac.in/noc20_cs90
- https://mrceet.com/downloads/digital_notes/CSE/III%20Year/COMPUTER%20GRAPHICS%20NOTES.pdf
- <http://www.augase.edu.in/cs/COMPUTER%20GRAPHICS%20NOTES.pdf>
- [https://archive.mu.ac.in/myweb_test/S.Y.B.Sc.\(IT\)%20\(Sem%20%20III%20\)%20Computer%20Graphics.pdf](https://archive.mu.ac.in/myweb_test/S.Y.B.Sc.(IT)%20(Sem%20%20III%20)%20Computer%20Graphics.pdf)

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
	Total Marks - 30	

End Semester Exam (ESE): Two section – A & B
Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4=20 Marks
Section B: Descriptive answer type qts. 1 out of 2 from each unit-4x10=40 Marks

Name and Signature of Convener & Members of CBOS:

Dr. H. S. Hota
Chairman

Kiran
Seem
Shubendra Singh

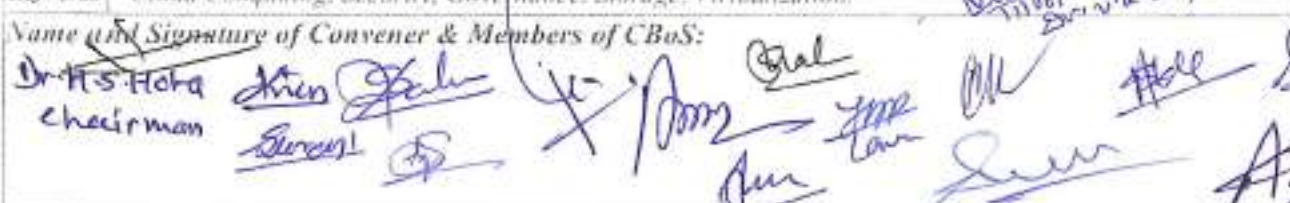
Prat
Prm

YMP
Law
Shan
Secretary
Kumar

Dr. V. K. Anand

Smit
ANJETA KUTCH
Seer

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application <i>(Certificate / Diploma / Degree/Honors)</i>		Semester - VII	Session: 2024-2025
1	Course Code	CASE-06T	
2	Course Title	Cloud Computing	
3	Course Type	DSE (Discipline Specific Elective)	
4	Pre-requisite	As per program	
5	Course Learning Outcomes (CLO)	After Completing this course, students will be able to: <ul style="list-style-type: none"> • 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. 	
6	Credit Value	3 Credits	<i>Credit = 15 Hours - learning & Observation</i>
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART -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	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.		12
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.		11
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.		11
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.		11
Keywords	Cloud Computing, Security, Governance, Storage, Virtualization.		
Name and Signature of Convener & Members of CBAS:			
Dr. H. S. Hota Chairman			
			

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

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

Reference Books Recommended:

- Cloud Computing: Principles and Paradigms, Editors: Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Wiley, 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 W3school:
<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/UCK73enkjQNDwdBqMyaMtRg>
- Cloud Computing Basics:
https://terrogum.com/tfox/books/cloudcomputingbasics_asefteachingintroduction.pdf
- CLOUD COMPUTING Principles and Paradigms :
https://dphoto.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_12qKYvU
- Introduction to Cloud Computing: <https://www.youtube.com/watch?v=Dv0sjAYnVCY>
- Cloud Computing Tutorials: <https://www.youtube.com/watch?v=NyA9PB6j8bg>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2):	20 +20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar -	10	
	Total Marks -	30	

End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts..1 out of 2 from each unit-4x10= 40 Marks
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Name and Signature of Convener & Members of CBoS:

Dr. H.S. Jhota
Chairman

Krishna

Prakash

Arjun

Arjun

Arjun

Arjun

Arjun

Arjun

Arjun

Arjun

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Rajkumar Buyya, Christian Vecchiola, S. ThamaraiSelvi, Mastering Cloud Computing, McGraw Hill Education.
- Barrie Sosinsky, "Cloud Computing Bible", Wiley India Edition.
- Anthony Velte, Toby Velte, Robert Elsenpeter, "Cloud Computing – A Practical Approach", Tata McGraw-Hill Edition.
- Kailash Jayaswal et al., Kogent Learning Solutions, Cloud Computing: Black Book, Dreamtech Press.

Reference Books Recommended:

- Rajkumar Buyya et al., Cloud Computing: Principals and Paradigms, Wiley India.
- Cloud Computing: Concepts, Technology & Architecture, Erl, Pearson Education India.
- Barrie Sosinsky, Cloud Computing Bible, O'Reilly Media.
- Toby Velte, Anthony Vote and Robert Elsenpeter, Cloud Computing: A Practical Approach, McGraw Hill.
- George Reese, Cloud Application Architectures: Building Applications and Infrastructures in the Cloud, O'Reilly Media.

Online Resources:

- Swayam/NPTEL: https://www.youtube.com/channel/UC6ZY_csXZc7YZZm2W8HcQ6A
- Javatpoint: <https://www.javatpoint.com/iot-internet-of-things>
- Tutorialspoint: https://www.tutorialspoint.com/internet_of_things/index.htm
- Topics Related to IOT from data-flair: <https://data-flair.training/blogs/iot-tutorial/>
- Topics Related to IOT from edureka: <https://www.edureka.co/blog/iot-tutorial/>
- Coursera: <https://www.coursera.org/courses?query=computing>
- 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>
- Lab Manuals:
- <https://annauniversityedu.blogspot.com/2020/10/cs8711-cloud-computing-laboratory.html>
- <https://drive.google.com/file/d/1oiuQYwkgFXy4R4518us4ynnXNFqx6OkW/view>
- <https://www.vidyarthiplus.com/vp/attachment.php?aid=53342>
- https://www.iare.ac.in/sites/default/files/lab1/CAD%20LAB%20UPDATED%20BY%20ANJAJAH-%20FINAL_0.pdf
- <https://jainakshay781.files.wordpress.com/2019/02/final-cc-ip-iv-manual-1.pdf>
- <http://www.gpcet.ac.in/wp-content/uploads/2018/08/GCC-LAB-MANUAL.pdf>

- <https://shanpnk.weebly.com/uploads/5/8/9/4/58948709/geclab-courseware-labmanual.pdf>
- <https://www.bharathuniv.ac.in/downloads/ese/BCS7L1%20-Grid%20&%20Cloud%20Computing%20lab.pdf>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
	Assignment/Seminar + Attendance - 05 Total Marks - 15	
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment	
	A. Performed the Task based on lab. work - 20 Marks	Managed by Course teacher as per lab. status
	B. Spotting based on tools & technology (written) - 10 Marks	
C. Viva-voce (based on principle/technology) - 05 Marks		

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Kota
Chairman

[Signatures]

[Signature]
(Sporon Thakur)

[Signature]
Sheelendra

[Signature]
Kumar

[Signature]
YMP

[Signature]
ANJEETA KULJA

[Signature]

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application <i>(Certificate / Diploma / Degree/Honors)</i>		Semester - VII	Session: 2024-2025
1	Course Code	CASE-07	
2	Course Title	Cryptography and Network Security	
3	Course Type	DSE (Discipline Specific Elective)	
4	Pre-requisite	<i>As per program</i>	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> Classify the symmetric encryption techniques. Illustrate various Public key cryptographic techniques. Evaluate the authentication and hash algorithms. Summarize the intrusion detection and its solutions to overcome the attacks. Basic concepts of system level security. 	
6	Credit Value	4 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART -B: 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	Classical Encryption Technique: Basics of computer network, TCP/IP model, Foundations of Cryptography and security trends, Secret key vs public key cryptography, Symmetric cipher model, substitution techniques, Transportation techniques, Mathematical tools for cryptography: modular arithmetic, Euclidean algorithm, finite fields, polynomial arithmetic. Symmetric cipher: Symmetric cipher model, Traditional block cipher: Stream and block cipher, Feistel cipher network structure, Design Principles of Block Ciphers, Data Encryption Standard (DES), Strength of DES Triple DES, Block cipher design principal, Block cipher operation, Advance encryption Standard (AES), Evaluation criteria of AES, AES transformation function, key distribution.	15
II	Public Key cryptography and Hash Function: Principles of public key cryptosystem, requirement, RSA algorithm. Hash function, Key management: Diffie-Helman Key exchange, Man in the middle attack, elliptic curve arithmetic, elliptic curve cryptography, Application of cryptographic hash function, Hash and Message authentication Code (MAC), Hash and MAC algorithms, MAC based on hash function, Digital signature and Authentication protocol. Key management and distribution: Distribution of symmetric key and public key, Public key Infrastructure (PKI).	15
III	IP and Web security protocols: User authentication: principle, Remote user authentication using symmetric and asymmetric encryption, Kerberos, E-mail security: Pretty Good Privacy (PGP), S/MIME, IP security: IPsec, transport layer Security: Secure Socket layer (SSL), Secure Electronic Transaction (SET).	15
IV	Network Security and Management: Principles of cryptography, Authentication, integrity, key distribution and certification, Access control and Firewalls, attacks and counter measures, security in many layers. Infrastructure for network management, The internet standard management framework, SMI, MIB, SNMP, Security and administration.	15

Keywords: *Symmetric Cipher, Hash, Message Authentication Code (MAC), Public key, Private key, Secure Socket Layer (SSL), Secure Electronic Transaction (SET).*

Name and Signature of Convener & Members of CBAS:

Dr. H. S. Hota
Chairman

(Handwritten signatures of faculty members)

ANJETA KUDVA

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Cryptography and Network Security, William Stallings, 4th Edition Pearson Publication.
- Network security and cryptography, Bernard Menezes, Cenage Learning India Pvt. Ltd. First edition 2010.

Reference Books Recommended:

- Applied cryptography - protocols and algorithm, Bruce Schneier, Springer Verlag 2003.
- Cryptography and Network Security, Atul Kahate, TMH Publication.
- Cryptography and Network Security, Behrouz A. Forouzan, First Edition, TMH Publication.
- Network Security: Private Communication in Public World By Charlie Kaufman, Radia Perlman and Mike Speciner, PHI Publication.

Online Resources:

- Swayam/NPTEL: https://onlinecourses.nptel.ac.in/noc20_cs21/preview
- Swayam/NPTEL: https://onlinecourses.nptel.ac.in/noc20_cs02/preview
- Coursera: <https://www.coursera.org/search?query=Cryptography>
- Coursera: <https://www.coursera.org/search?query=network%20security&>
- <https://www.gatevidyalay.com/tag/cryptography-and-network-security-tutorial/>
- <https://www.javatpoint.com/computer-network-security>
- <https://www.geeksforgeeks.org/cryptography-introduction/>
- <https://www.tutorialspoint.com/cryptography/index.htm>
- https://www.vssut.ac.in/lecture_notes/lecture1428550736.pdf
- Lab Manuals:
 - <http://www.anuraghyd.ac.in/cse/wp-content/uploads/sites/10/NS-CRYPTO-LAB-Final11.pdf>
 - <https://www.vvitengineering.com/lab/odd/CS6711-Security-Lab-Manual.pdf>
 - <https://www.vidyarthiplus.com/vp/attachment.php?aid=53300>
 - <https://kgr.ac.in/storage/2021/08/CNS-LAB-Manual.pdf>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2):	20 +20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar -	10	
	Total Marks -	30	

End Semester Exam (ESE):	Two section - A & B Section A: Q1. Objective - 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit-4x10=40 Marks
--------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

[Signature]

[Signature]
Suresh Thakur

[Signature]
Shankar Singh

[Signature]
Anurag

[Signature]
Anurag

[Signature]
Anurag

[Signature]
ANJETA KUMAR

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF INFORMATION TECHNOLOGY
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester – VIII	Session: 2024-2025
1	Course Code	CASE-09	
2	Course Title	Soft Computing	
3	Course Type	DSE (Discipline Specific Elective)	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> 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). Students would 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 Ability to appreciate the importance of optimizations and its use in computer engineering fields and other domains. To introduce the ideas of fuzzy sets, fuzzy logic and use of heuristics based on human experience. 	
6	Credit Value	4 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART -B: 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, α -cuts, Properties of α -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 separability, Supervised and unsupervised learning, perceptron learning, delta learning, Feed-forward and Feedback networks, Error Back Propagation Network (EBPN), Associative memories and its types, Hopfield Network, Kohenenself-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 computing: Design of Neuro-Fuzzy model like ANFIS, Neuro-Genetic, Fuzzy-Genetic Neuro-Fuzzy-Genetic model.		15
Keywords Soft Computing, Fuzzy Logic, ANN, Genetic Algorithm.			
Name and Signature of Convener & Members of CBoS:			
<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> <p><i>D. H. S. Jhota</i> Chairman</p> </div> <div style="text-align: center;"> <p><i>Kiran</i></p> </div> <div style="text-align: center;"> <p><i>Shailendra</i></p> </div> <div style="text-align: center;"> <p><i>Prakash</i></p> </div> <div style="text-align: center;"> <p><i>Prakash</i> (Suresh Thakur)</p> </div> <div style="text-align: center;"> <p><i>Prakash</i></p> </div> <div style="text-align: center;"> <p><i>Prakash</i></p> </div> <div style="text-align: center;"> <p><i>Prakash</i></p> </div> <div style="text-align: center;"> <p><i>Prakash</i></p> </div> <div style="text-align: center;"> <p><i>Prakash</i></p> </div> <div style="text-align: center;"> <p><i>Prakash</i></p> </div> </div>			

ANJETA KUMAR

PART-C: Learning Resources

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. Kataraiia and Sons publication.
- Artificial Neural Networks, B.Yegnanarayana Prentice Hall of India (P) Limited.
- Introduction to Artificial Neural Systems, Jacek M. Zurada, Jaico Publication House.

Online Resources:

- Introduction to Soft Computing from SWAYAM-NPTEL:
<https://www.classcentral.com/course/swayam-introduction-to-soft-computing-10053>
- 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 \(nptel.ac.in\)](#)

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 & 20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
	Total Marks - 30	

End Semester Exam (ESE): Two section – A & B
Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks
Section B: Descriptive answer type qts., 1 out of 2 from each unit-4x10=40 Marks

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

(Signatures of Convener and Members of CBoS)

ANJEETA KUMAR

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Chris Eaton, Dirk deroos et al. , —Understanding Big data , McGraw Hill, 2012.
- Thomas Erl, Wajid Khattak, Paul Buhler, Big Data Fundamentals: Concepts, Drivers & Techniques. 1/e, 2016, Prentice Hall.
- Vignesh Prajapati, Big Data Analytics with R and Hadoop, 1e, 2013, Packt Publishing Ltd, UK.

Reference Books Recommended:

- Norman Matloff, The Art of R Programming: A Tour of Statistical Software Design, revised, 2011, No Starch Press
- Tom White, "Hadoop: The Definitive Guide," 3/e, 2012, O'REILLY Publications.
- Paul Zikopoulos, IBM, Chris Eaton, Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and streaming Data", 2012, The McGraw-Hill Companies.
- Bart Baesens, "Analytics in a Big Data World: The Essential Guide to Data Science and its Applications", 2014, Wiley Publications.
- Anand Rajaraman and Jeffrey David Ullman, Mining of Massive DatasetsI, 2012, Cambridge University Press.

Online Resources:

- Swayam/NPTEL: https://onlinecourses.nptel.ac.in/noc20_cs92/preview
- Swayam/NPTEL: https://onlinecourses.swayam2.ac.in/arp19_ap60/preview
- Coursera: <https://www.coursera.org/search?query=big%20data%20analytics>
- What is Big Data?: <https://www.javatpoint.com/what-is-big-data>
- Big Data Tutorials:
- <https://www.edureka.co/blog/big-data-tutorial>
- <https://www.guru99.com/bigdata-tutorials.html>
- <https://www.softwaretestinghelp.com/big-data-tutorial/>
- <https://data-flair.training/blogs/big-data-tutorials-home/>
- <https://www.simplilearn.com/tutorials/big-data-tutorial>
- https://www.tutorialspoint.com/big_data_tutorials.htm
- Big Data Practical Approach:
- <http://deccancollege.ac.in/MCALABMANUALS/BIGDATALABMANUAL.pdf>
- https://www.iare.ac.in/sites/default/files/lab1/IARE_BIGDATA_LAB_MANUAL.pdf
- <https://www.studocu.com/in/document/gujarat-technological-university/big-data-analytics/big-data-analytics-2180710-lab-manual/18844373>
- <https://usermanual.wiki/Document/CP5261202020DATA20ANALYTICS20LABORATORY20MANUAL20ME20CSE.1885205982/help>
- https://sites.google.com/site/vsat2k/beit_bda

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2):	20 & 20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar -	10	
	Total Marks -	30	

End Semester
Exam (ESE):

Two section - A & B

Section A: Q1. Objective - 10 x 1 = 10 Mark; Q2. Short answer type- 5x4 = 20 Marks

Section B: Descriptive answer type qts. 1 out of 2 from each unit-4x10=40 Marks

Name and Signature of Convener & Members of CBoS:

Dr. H. S. Hots
Chairman





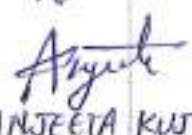

(K. S. Thakur)


S. S. Thakur


S. S. Thakur


S. S. Thakur


S. S. Thakur


ANJEETA KIJUR

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester - VIII	Session: 2024-2025
1	Course Code	CASE-12	
2	Course Title	Major Project-2	
3	Course Type	DSE (Discipline Specific Elective)	
4	Prerequisite	<i>As per program</i>	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • 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. 	
6	Credit Value	4 Credits	<i>Credit = 15 Hours - Learning & Observation</i>
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART -B: Content of the Course			
Total No. of Teaching-Learning hours - 60 Hours			
	Important Guidelines for Project		No. of Period
	<p>A project report has to be submitted as per the rules described below:</p> <ol style="list-style-type: none"> 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 <ol style="list-style-type: none"> 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 blank 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**

Name and Signature of Convener & Members of CBoS:

Dr. H. S. Hota
Chairman

Krishna
Sri

Suresh Kumar

Shrinidhi
Aga

Amr

Chal

Sunil

JMP

Dr. Anil Kumar
Vice-Chairman

Ch

JMP

Anjeeta

ANJEETA KUMAR

PART-C: Learning Resources

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=tTBITZUdivHpNzIH>
- NPTEL YouTube Channel: Software Engineering Lecture Series https://youtube.com/playlist?list=PL8751DA481F0F0D17&si=071FYV7GP8_oc1xZ

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

End Semester Exam (ESE): 100 Marks

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hebq
Chairman

[Signature]
Kishor

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S. S.

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S. S.

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ANJEETA Kujur

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester - I	Session: 2024-2025
1	Course Code	CAGE-01T	
2	Course Title	Computer Fundamental and MS office	
3	Course Type	DGE (Discipline Generic Elective)	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	After Completing this course, students will be able to: <ul style="list-style-type: none"> • Study and use of basic concepts and terminology of information technology. • Organize files and documents on storage devices. • Acquire knowledge of ICT and Internet applications. • Develop information technology solutions by evaluating user requirements in advance trends of IT. • Acquire knowledge of MS-Excel, MS-PowerPoint and MS-Access. 	
6	Credit Value	3 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART -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 to Computer: History of computer, Generations and Classification, Basic Anatomy of Computer: Block Diagram, Central Processing Unit (CPU): Function of each Unit, Memory: Primary, Cache, Flash, Software and its needs, Types of S/W: System Software and Application Software, Types of Programming Language: Machine Language, Assembly Language, High Level Language their advantages and disadvantages, Language Processors/Translators: Assembler, Interpreter and Compiler, Fundamental of Information Technology: Data and Information, Concept of IT, Application of IT, What is ICT?, Components of ICT, Impact of ICT in Society. Advanced Trends in IT: Cloud Technology, Virtual LAN Technology, M-Commerce, Nanotechnology, Virtual Reality, 3-D Printing, Internet of Things (IoT), Artificial Intelligence (AI), Machine Learning (ML), Cloud Computing, Quantum Computing, G-Suite, Gol digital initiatives in higher education: SWAYAM, Swayam Prabha, National Academic Depository, National Digital Library of India, E-Sodh-Sindhu, Virtual labs, e-Yantra and NPTEL.		12
II	MS-Word: Introduction to word processing software and its features, Creating new document, Saving documents, Opening and Printing documents. Home Tab: Setting fonts, Paragraph settings, Various styles (Normal, No spacing, Heading1, Heading2, Title, Strong), Find & Replace, Format painter, Copy paste and paste special. Insert Tab: Pages, Tables, Pictures, Clipart, Shapes, Header & Footer, Word Art, Equation and Symbols. Page Layout Tab: Page setup, Page Background, Paragraph (indent and spacing). Mailing Tab: Create Envelops and Labels, Mail Merge. Review Tab: Spelling and Grammar check, New comment, Protect document, View Tab: Document views, Zoom, Window (New window, Split, Switch window).		11
III	MS-Excel: Introducing Excel, Use of Excel sheet, creating new sheet, Saving, Opening, and Printing workbook. Home Tab: Font, Alignment, Number, Styles and cells and editing, Conditional Formatting. Insert Tab: Table, Charts (column chart, Pie chart, Bar chart, Line chart) and Texts (header & footer, word art, signature line). Page Layout Tab:		11

Online Resources:

- Introduction to Computer Fundamental from W3school:
<https://www.w3schools.blog/computer-fundamentals-tutorial>
- Introduction to MS-Word from W3school:
<https://www.w3schools.blog/ms-word-tutorial>
- Introduction to MS-Excel from W3school:
https://www.w3schools.com/excel/excel_introduction.php
- Introduction to MS-PowerPoint from W3school:
<https://www.w3schools.blog/powerpoint-tutorial>
- Introduction to MS-Access from W3school:
https://www.w3schools.com/sql/sql_ref_msaccess.asp
- Fundamentals of Computers & Information Technology (in Hindi) :
<https://www.mcu.ac.in/wp-content/uploads/2020/04/1PGDCA1-Unit-1-Fundamentals-of-Computers-Information-Technology.pdf>
- Fundamentals of Computers & Information Technology (in Hindi):
https://hte.mjasthan.gov.in/dept/dte/board_of_technical_education_rajasthan/government_polytechnic_college_hanumangarh/uploads/doc/fundamental-final-rkd.pdf
- Information and Computers Technology: https://cbseacademic.nic.in/web_material/doc/2014/11 ICT-IX.pdf.pdf
- Microsoft Office (in Hindi):
<https://www.scribd.com/document/534988849/9-Microsoft-office-in-hindi-www-GkNotesPDF-com>
- MS-OFFICE:
<https://www.rgyesm.org/uploads/books/MICROSOFT-OFFICE-BOOK.pdf>
- MS-OFFICE:
Hindi Notes: <https://www.copaguide.com/2020/04/ms-office-topics.html>
- Microsoft Office Full Crash Course:
<https://www.youtube.com/watch?v=SH4oyV5AJ6A>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 & 20	Better marks out of the two Test / Quiz obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
	Total Marks - 30	

End Semester Exam (ESE): Two section - A & B
Section A: Q1. Objective - 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks
Section B: Descriptive answer type qts. 1 out of 2 from each unit-4x10=40 Marks

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hebra
Chairman

Dr. V.K. Gupta

Shailendra Arora

Shri. Kishan Kumar

ANJEETA KUMAR

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction

Program: Bachelor of Computer Application (Certificate / Diploma / Degree)		Semester - I	Session: 2024-2025
1	Course Code	CAGE-01P	
2	Course Title	Lab 1: MS-Office	
3	Course Type	Practical	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	After Completing this course, students will be able to: <ul style="list-style-type: none"> • Gain Practical knowledge of MS-Office. • Organize files and documents on storage devices. • Acquire knowledge of ICT and Internet applications. • Develop information technology solutions by evaluating user requirements in advance trends of IT. • Acquire knowledge of MS-Excel, MS-PowerPoint and MS-Access. 	
6	Credit Value	1 Credits	Credit =30 Hours Laboratory or Field Learning/Training
7	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)

	List of Experiments	No. of Period
	Application of Information Technology	30
	<ol style="list-style-type: none"> 1. How to create mail in a Gmail account? Write the uses of Inbox, Sent, Outbox, Draft, Spam and Trash labels. 2. How to design Google form? Write the steps with appropriate windows. 3. How to create different student classes in Google classroom. 4. How do teachers create assignments and provide due dates, or grades in Google Classroom? 5. How do students find assignments, due dates, or grades in Google Classroom? 6. How to use social media platforms like twitter, Facebook and YouTube? 7. How to use social media platforms like Flickr, Skype, yahoo and WhatsApp? 8. How to use Google spreadsheets, Google Slides and Google forms? 9. How to share files between mobile phone and computer system/Laptop using Bluetooth. <p>*****</p> <p style="text-align: center;">MS-Word</p> <ol style="list-style-type: none"> 1. Prepare a grocery list having four columns (Serial number, the name of the product, quantity and price) for the month of April, 06. <ul style="list-style-type: none"> > Font specific actions for Title (Grocery List): 14-point Arial font in bold and italics. > The headings of the columns should be in 12-point and bold. > The rest of the document should be in 10-point Times New Roman. 	

- Leave a gap of 12-points after the title.
2. Create a telephone directory.
- The heading should be 16-point Arial Font in bold.
 - The rest of the document should use 10-point font size.
 - Other headings should use 10-point Courier New Font.
 - The footer should show the page number as well as the date last updated.
3. Design a time-table form for your college.
- The first line should mention the name of the college in 16-point Arial Font and should be bold.
 - The second line should give the course name/teacher's name and the department in 14-point Arial.
 - Leave a gap of 12-points.
 - The rest of the document should use 10-point Times New Roman font.
 - The footer should contain your specifications as the designer and date of creation.
4. XYZ Publications plan to store lease an e-book design based on your syllabus. Design the First page of the book as per the given specifications.
- The title of the book should appear in bold using 20-point Arial font.
 - The name of the author and his qualifications should be in the center of the page in 16-point Arial font.
 - At the bottom of the document should be the name of the publisher and address in 16-point Times New Roman.
 - The details of the offices of the publisher (only location) should appear in the footer.
5. Create the following one page documents.
- Compose a note inviting friends together at your house, including a list of things to bring with them.
 - Design a certificate in landscape orientation with a border around the document.
 - Design a Garage Sale sign.
 - Make an assignment outlining your rules for your bedroom at home, using a numbered list.
6. Create the following documents:
- A newsletter with a headline and 2 columns in portrait orientation, including at least one image surrounded by text.
 - Use a newsletter format to promote upcoming projects or events in your classroom or college.
7. Convert following text to a table, using comma as delimiter Type the following as shown (do not bold).
- | Color, Style, Item |
|----------------------------|
| Blue, A980, Van |
| Red, X023, Car |
| Green, YL724, Truck |
| Name, Age, Sex |
| Bob, 23, M |
| Linda, 46, F |
| Tom, 29, M |
8. Enter the following data into a table given on the next page.

Salesperson	Dolls	Trucks	Puzzles
Kennedy, Sally	1327	1423	1193
White, Pete	1421	3863	2934
Pillar, James	5214	3247	5467
York, George	2190	1278	1928
Banks, Jennifer	1201	2528	1203
Atwater, Kelly	4098	3079	2067
Pillar, James	5214	3247	5467
York, George	2190	1278	1928
Banks, Jennifer	1201	2528	1203
Atwater, Kelly	4098	3079	2067

Add a column Region (values: S, N, N, S, S, S) between the Salesperson and Dolls columns to the given table Sort your table data by Region and within Region by Sales person in ascending order:

In this exercise, you will add a new row to your table, place the word Total at the bottom of the Sales person column, and sum the Dolls, Trucks, and Puzzles columns.

9. Wrapping of text around the image.
10. How to install MS-Office in Windows operating system.
11. How to convert word, excel and PowerPoint into pdf & pdf to word.
12. How to merge and split pdf files.

MS-Excel

1. Enter the Following data in Excel Sheet

REGIONAL SALES PROJECTION						
State	Qtr1	Qtr2	Qtr3	Qtr4	Qtr Total	Rate Amount
Delhi	2020	2400	2100	3000	15	
Punjab	1100	1300	1500	1400	20	
U.P.	3000	3200	2600	2800	17	
Haryana	1800	2000	2200	2700	15	
Rajasthan	2100	2000	1800	2200	20	
TOTAL						
AVERAGE						

- a. Apply Formatting as follow:
 - Title in TIMES NEW ROMAN
 - FontSize-14
 - Remaining text-ARIAL, FontSize-10
 - State name and Qtr. Heading Bold, Italic with Gray Fill Color.
 - Numbers in two decimal places.
 - Qtr. Heading in center Alignment.
 - Apply Border to whole data.
- b. Calculate State and Qtr. Total
- c. Calculate Average for each quarter

d. Calculate Amount=Rate*Total.

2. Given the following worksheet

	A	B	C	D
1	Roll No.	Name	Marks	Grade
2	1001	Sachin	99	
3	1002	Schwag	65	
4	1003	Rahul	41	
5	1004	Sourav	89	
6	1005	Harbhajan	56	

Calculate the grade of these students on the basis of following guidelines:

If Marks	Then Grade
>=80	A+
>= 60 and <80	A
>= 50 and <60	B
<50	F

3. Given the following worksheet

	A	B	C	D	E	F	G
1	Salesman	Sales in(Rs.)					
2	No.	Qtr1	Qtr2	Qtr3	Qtr4	Total	Commission
3	S001	5000	8500	12000	9000		
4	S002	7000	4000	7500	11000		
5	S003	4000	9000	6500	8200		
6	S004	5500	6900	4500	10500		
7	S005	7400	8500	9200	8300		
8	S006	5300	7600	9800	6100		

Calculate the commission earned by the salesman on the basis of following Candidates:

If Total Sales	Then Commission
<20000	0% of sales
> 20000 and < 25000	4% of sales
> 25000 and < 30000	5.5% of sales
> 30000 and < 35000	8% of sales
>=35000	11% of sales

The total sales are the sum of sales of all the four quarters.

4. Company XYZ Ltd. pays a monthly salary to its employees who consist of basic salary, allowances & deductions. The details of allowances and deductions are as follows:

- HRA Dependent on Basic
 - 30% of Basic if Basic ≤ 1000
 - 25% of Basic if Basic > 1000 & Basic ≤ 3000
 - 20% of Basic if Basic > 3000
- DA Fixed for all employees, 30% of Basic
- Conveyance Allowance(CA)

Rs.50/- if Basic is ≤ 1000
 Rs.75/- if Basic > 1000 & Basic ≤ 2000
 Rs.100 if Basic > 2000

- Entertainment Allowance (EA)
 NIL if Basic is ≤ 1000
 Rs.100/-if Basic > 1000

Deductions

- Provident Fund
 6% of Basic
- Group Insurance Premium
 Rs.40/-if Basic is ≤ 1500
 Rs.60/-if Basic > 1500 & Basic ≤ 3000
 Rs.80/-if Basic > 3000

Calculate the following:

Gross Salary = Basic + HRA + DA + CA + EA

Total Deduction = Provident Fund + Group Insurance Premium

Net Salary = Gross Salary - Total Deduction

5. Create Payment Table for a fixed Principal amount, variable rate of interests and time in the form at below:

No. of Installments	5%	6%	7%	8%	9%
3	XX	XX	XX	XX	XX
4	XX	XX	XX	XX	XX
5	XX	XX	XX	XX	XX
6	XX	XX	XX	XX	XX

6. Use an array formula to calculate Simple Interest for given principal amounts given the rate of Interest and time

Rate of Interest	8%
Time	5Years
Principal	Simple Interest
1000	?
18000	?
5200	?

7. The following table gives a year wise sale figure of five salesmen in Rs.

Salesman	2019	2020	2021	2022
S1	10000	12000	20000	50000
S2	15000	18000	50000	60000
S3	20000	22000	70000	70000
S4	30000	30000	100000	80000
S5	40000	45000	125000	90000

- Calculate total sale year wise.
- Calculate the net sale made by each salesman
- Calculate the maximum sale made by the salesman
- Calculate the commission for each salesman under the condition.

>> If total sales > 4, 00,000 give 5% commission on total sale made by the salesman.

>> Otherwise give 2% commission.

- e. Draw a bar graph representing the sale made by each salesman.
- f. Draw a pie graph representing the sale made by a salesman in 2000.

8. Enter the following data in Excel Sheet

PERSONAL BUDGET FOR FIRST QUARTER

Monthly Income(Net): 1,475

EXPENSES	JAN	FEB	MARCH QUARTER TOTAL	QUARTER AVERAGE
Rent	600.00	600.00	600.00	
Telephone	48.25	43.50	60.00	
Utilities	67.27	110.00	70.00	
Credit Card	200.00	110.00	70.00	
Oil	100.00	150.00	90.00	
AV to Insurance	150.00			
Cable TV	40.75	40.75	40.75	
Monthly Total				

- a. Calculate Quarter total and Quarter average.
 - b. Calculate Monthly total.
 - c. Surplus=Monthly income-Monthly total.
 - d. What would be the total surplus if monthly income is 1500.
 - e. How much does the telephone expense for March differ from quarter average?
 - f. Create a 3D column graph for telephone and utilities.
 - g. Create a pie chart for monthly expenses.
9. Enter the following data in Excel Sheet

TOTAL REVENUE EARNED FOR SAM'S BOOK STALL

Publisher Name	1997	1998	1999	2000	Total
A	Rs. 1,000.00	Rs. 1100.00	Rs. 1,300.00	Rs. 800.00	
B	Rs. 1,500.00	Rs. 700.00	Rs. 1,000.00	Rs. 2,000.00	
C	Rs. 700.00	Rs. 900.00	Rs. 1,500.00	Rs. 600.00	
D	Rs. 1,200.00	Rs. 500.00	Rs. 200.00	Rs. 1,100.00	

- a) Compute the total revenue earned.
 - b) Plot the line chart to compare the revenue of all publishers for 4 years.
 - c) Chart Title should be Total Revenue of Sam's Book stall(1997-2000)
 - d) Give appropriate categories and value axis title.
10. Generate 25 random numbers between 0 & 100 and find their sum, average and count. How many no. are in the range 50-60.

MS-Power Point

1. Do the following task:
 - Start a new blank presentation
 - Your first Slide is going to be a Title Slide
 - Write the Text as in the preview below:

- Lighthouse Co Ltd
- Make the Font of "Lighthouse" Arial Black and size 88
- Insert a second slide this should be with a layout of Bulleted List
- Write the Text as in preview below
- [Title]: Lighthouse Co Ltd
- [Body]:
 - i. Mission Statement
 - ii. Company Objectives
 - iii. Management Team
 - iv. Employees
 - v. Sales

Make the Font Color of the Points to Green

Insert a third slide that should be an Organization Chart.

Include the following people in the chart:

- a. David Brent, General Manager
- b. Tim Canterbury, Head of Sales
- c. Gareth Keenan, Assistant to the General Manager
- d. Dawn Tinsley, Human Resources Manager

Add a fourth slide and this should be a Table Chart.

The chart should look like the following:

New Products	Discontinued Products
Digital Cameras	8mm Cameras
Ultra Slim Video Camera	8x Zoom Video Camera
25" Plasma TVs21"	Black and White TVs
DVD Recorders	Video Players
7.1 Dolby Surround Systems	2 channel stereo systems

- Make the titles New Products and Discontinued Products with a shadow effect and centered in the cell. Widen columns to fit Text as above.
- The Fifth slide should be a Chart slide. The chart should be a bar chart, and include the following data must be used to form the chart:

	January	February	March	April
TVs	20	27	90	75
DVDs	30	38	34	31
Wifi equipment	45	46	45	43
Video Recorders	25	29	15	40

- Change the colours of the chart so that the series of bars are red, yellow, pink, and green.
 - Add a light coloured background to all slides in the presentation.
 - Add also Transition effects between each slide and also different effects for all text and pictures in the presentation.
 - Reverse the order of the second and third slides
 - Save the presentation as Light House Ltd.
2. Do the following:
- Load your Presentation Application and start a new presentation
- The first slide is a Title Slide. Select the appropriate layout and enter the title:
Annual Food Fair
 - Add the subtitle: **A Celebration of Eating**
 - Insert a small, red circle at the bottom right of the title slide.

- Change the font color for the whole title and subtitle to blue, and apply a text shadow effect just to the words **Food** and **Fair**
- Insert a second slide to the presentation, selecting a layout appropriate for a series of bullet points, and using the title: **The Menu**. Enter the following text:
 - i. Chocolate Desserts
 - ii. Cakes and Puddings
 - iii. Roast Meals
 - iv. Using Pasta Creatively
- Change the line spacing for these bullet points to 1.5 lines.
- Increase the font size for the words **The Menu** in the title,
- Add a footer with your name and the text: **Food Fair** so they both appear on every slide, and number all the slides. (Make sure the number is not obscured by the red circle on the title slide)
- Insert a third slide, which is to be an organization chart. Use the title **Meet The Team**. Enter: **Maggie Peet, Manager** at the top of the chart, and show the following three as reporting to Maggie Peet: **Brian Webb, Bookings; Janine Newton, Publicity; Gregg Brown, Accounts**
- Embolden the text in the title of the third slide, and change the font to Arial.
- Apply a light coloured background to all the slides in the presentation
- On the third slide, insert an image suitable for the topic of food from an image library. Reduce the size of the image and place it where it will not interfere with text.
- Save the presentation as **foodfair**.
- Print the presentation with three slides per page, and close the presentation.

3. Do the followings:

- Load your Presentation Application and start a new presentation
- The first slide is a Title Only Slide. Select the appropriate layout and enter the title: **Cook Family Cruises**.
- Add a small blue rectangle at the top left of this slide.
- Change the font color for the whole title to red, and apply a text shadow effect just to the word **Cruises**.
- Insert a second slide to the presentation, selecting a layout appropriate for a series of bullet points, and using the title: **Our Itinerary**. Enter the following text:
 - a. Canary Islands
 - b. Mediterranean
 - c. Greek Islands
- Change the line spacing for these bullet points to 2 lines. Increase the font size of the word **Itinerary** in the title. Add a footer with your name and the text: **Cruise Information** so they both appear on every slide, and number all the slides.
- Insert a third slide, which is to be a graph. Use the title **Our Market Share**. Use the following data to produce a pie chart: Cook 54%; Jackson 28%; Wilson 12%; Bennett 5%
- Embolden the text in the title of the third slide, and change the font to Arial.
- Apply a different background to each slide in the presentation.
- On the third slide, insert an image suitable for the topic of holidays from an image library. Reduce the size of the image and place it where it will not interfere with text.
- Add a 4-slide containing nothing but the text: **Travel with us for less!!**
- Save the presentation as a holiday.
- Print the presentation with 4 slides per page, and close the presentation.

4. Creating an animation looks like the leaf is falling in a tree.

5. Creating an animation looks like demolishing a world trade center in America.

MS-Access

1. Create a database named "college" and perform the following tasks:
 - A. Create a table named "student" having following fields:
Class, Roll no and Name with these Information i.e., Field Name, Data type and Description
 - B. Fill at least 5 records.
 - C. Prepare a query to display all records and Name should be in ascending order.
2. Create the employee table in MS-Access with the referential integrity-foreign key.

Note: This is a tentative list; the teachers' concern can add more program as per requirement.

Key words: Information Technology (IT), Information and Communication Technology (ICT), G-Suite, MS Word, MS Excel, MS Power Point, MS-Access.

Name and Signature of Convener & Members of CBAS:

(Dr. H. G. Hotal)
(Chairman)

[Signature]

[Signature]

(Suresh Kumar)

[Signature]

[Signature]
S. Prasad
A. N. 7

[Signature]

[Signature]
Dr. V. V. K. S. Jais

[Signature]
B. T. S. Jais

[Signature]

[Signature]
ANJETA K. J. J.

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Computer Fundamentals, P.K. Sinha, BPB Publication, Sixth Edition.
- Fundamentals of Information Technology, Chetan Shrivastava, Kalyan Publishers.
- Fundamentals of Computers, V. Rajaraman, PHI Sixth Edition.
- Computer Fundamentals and Office Automation, Dr. Santosh Kumar Miri, Iterative International Publisher IIP.
- Computer Fundamentals Architecture and Organization, B. Ram, New Age International Publishers, Fifth Edition.
- Fundamentals of Information Technology, Alexis Leon and Mathews Leon, Vikash Publication.

Reference Books Recommended:

- Introduction to Information Technology, V. Rajaraman, PHI publication.
- Fundamental of IT, Leon and Leon, Leon Tec world.
- Introduction to Information Technology, Aksoy and Denardis, Cengage learning.
- Computers Today, Suresh K. Basandra, Galgotia Publications.
- Information Technology – The breaking wave, Dennis P.Curtin, Kim Foley, Kunai Sen and Cathleen Morin, TMH.
- OFFICE 2013 in Simple Steps, Kogent Solution Inc., DremTech Press.
- Access 2010 in Simple Steps by Kogent Learning Solutions Inc.

Online Resources:

- Introduction to Computer Fundamental from W3school:
<https://www.w3schools.blog/computer-fundamentals-tutorial>
- Introduction to MS-Word from W3school:

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction

Program: Bachelor in Computer Application <i>(Certificate / Diploma / Degree/Honors)</i>		Semester - I	Session: 2024-2025
1	Course Code	CAGE-02T	
2	Course Title	Operating System	
3	Course Type	DGE (Discipline Generic Elective)	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the concept of operating system. • Understand the Disk operating system (DOS). • Work with DOS using DOS commands. • Understand the Windows operating system. • Understand the Linux operating system. 	
6	Credit Value	3 Credits	<i>Credit = 15 Hours - Learning & Observation</i>
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART -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	Operating System Concepts: Evolution of Operating Systems, Types of operating systems, Operating system structure, Generations of Operating System, Function and Services of Operating System, System Calls, System Boot, System Programs, Protection and Security of Operating System.	12
II	Disk Operating System: Introduction to DOS, History of DOS, Booting process of DOS, File & directory structure and naming rules, DOS system files. Internal commands of DOS – DIR, CLS, VER, VOL, DATE, TIME, COPY, TYPE, REN, DEL, CD, MD, RD, PATH etc. External Commands - CHKDSK, XCOPY, PRINT, DISKCOPY, DISKCOMP, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB, HELP, SYS.	11
III	Windows: Windows Operating System: History, Version and features of Windows, Basics of Windows, Windows concepts, Windows Structure, Desktop, Taskbar, Start Menu, working with files and folders, create, copy, delete, renaming and moving files and folders, working with recycle bin restoring deleted files, emptying the recycle bin, searching files and folders. Windows Explorer, Windows Accessories, Control Panel, Print Manager and Installing Printers. My computer, Media Player, Sound Recorder, Volume Control. Advanced features of Windows - Managing Hardware & Software Add or remove Hardware devices to/from computer, Add/remove programs, Backup, Clipboard Viewer, Disk Defragmenter, Drive Space, Scandisk, System Information windows update.	11
IV	Linux: Linux introduction, Advantages, Features of Linux, Basic Architecture of Unix/Linux system, Kernel, Shell, Linux File system, Linux standard directories. Partitioning the Hard drive for Linux, Installing the Linux system, System, startup and shut-down process, How Linux works, Linux GUI, Linux Desktop, Linux command cd, md, rm, mv, cp, ls, cat, find, grep, head, and tail.	11

keywords Operating System, DOS, Windows, Linux

Name and Signature of Convener & Members of CoS:

Dr. H.S. Heta
 Chairman


 Krishna Khat


 Dr. S. Jain


 Shilpa Arora


 Anshu Kaur


 Arjuna

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Peter Baer Galvin, Greg Gagne, Operating System Concepts – Abraham Silberschatz, 8th edition, Wiley-India, 2009.
- Andrew S. Tanenbaum, Modern Operating Systems, 3rd Edition, PHI
- Elmasri, Carrick, Levine, Operating Systems: A Spiral Approach – TMH Edition

Reference Books Recommended:

- Akshay Singh, Operating System, RGCSM Publications
- Russell A Stultz, MS DOS 6.22, BPB Publications
- Brain Underdahl, Teach yourself Windows 2000, Wiley Publications.
- Peter Norton, Maximizing Windows, Teachmedia.
- Ray Duncan, Advances MS-DOS Programming, BPB
- Ray Yao, Shell Scripting in 8 Hours

Online Resources:

- Fundamentals of Computer, Windows Operating System: <https://vikaspedia.in/education/digital-literacy/it-literacy-courses-in-associating-with-msup/computer-fundamentals>
- Introduction to Operating System: <https://www.w3schools.in/operating-system/tutorials/>
- Introduction to Operating System: <https://www.javatpoint.com/windows>
- Windows : <https://www.javatpoint.com/windows>
- Linux: <https://www.javatpoint.com/what-is-linux>
- DOS: <https://www.geeksforgeeks.org/ms-dos-operating-system/>
- DOS : <https://www.javatpoint.com/ms-dos-operating-system>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 & 20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
	Total Marks - 30	

End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit-4x10=40 Marks
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Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

[Signature]
[Signature]
[Signature]
Suresh Thakur

[Signature]
Jitendra Kumar

[Signature]
(D.V.S. Jain)

[Signature]
JMD
Lance

[Signature]
Swilinda Arya

[Signature]

[Signature]
ANJEEVA KUMAR

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction		
Program: Bachelor in Computer Application (Certificate / Diploma / Degree)		Semester - I
		Session: 2024-2025
1	Course Code	CAGE-02P
2	Course Title	Lab 2: Operating System
3	Course Type	Practical
4	Prerequisite	As per program
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the fundamental concepts of DOS, Windows and Linux Operating System. • Understand basics of DOS commands and its types. • Understand features of Windows Operating system. • Understand comparative features of DOS and Windows Operating systems. • Explore functionality of Linux.
6	Credit Value	1 Credits Credit =30 Hours Laboratory or Field Learning/Training
7	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 Experiment	<ol style="list-style-type: none"> 1. Demonstrate different Directory naming listing structure with all options. 2. Create one file and rename file using DOS command 3. Demonstrate all Internal DOS Commands with Output. 4. Demonstrate all external DOS Commands with output. 5. Introduction to Windows and Familiarity with its controls. 6. Study and use of Desktop, my computer, recycle bin, Task bar. 7. Working with Files and Folder. 8. Use of various window applications: Calculator, notepad and MS-Paint. 9. Explaining control panel options. 10. Working with printers. 11. Create a file using Linux command. 12. Write a Linux command which lists all files and directories. 13. Demonstrate use of grep command. 14. Create Directory using Linux command and create 3 different files in this directory. 15. Delete above created files and directory using Linux command. 16. Explaining various flavors of Linux. <p>Note: Concerned teacher can add additional experiment as per requirement.</p>	30

Keywords DOS, Windows, Linux.

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

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[Signature]
Suresh Thakur

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Dr. Sain

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[Signature]
ANJETA KUTUR

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Rusell A Stultz, MS DOS 6.22 BPB Publications
- Brain Underdahl, Teach yourself Windows 2000, Wiley Publications.

Reference Books Recommended:

- Peter Norton, Maximizing Windows, Teachmedia.
- Ray Duncan, Advances MS-DOS Programming, BPB
- Akshay Singh, Operating System, RGCSM Publications
- Ray Yao, Shell Scripting in 8 Hours

Online Resources:

- DOS: <https://www.javatpoint.com/ms-dos-operating-system>
- Windows: <https://www.javatpoint.com/windows>
- Linux: <https://www.javatpoint.com/what-is-linux>
- Fundamentals of Computer, Windows Operating System:
<https://vikaspedia.in/education/digital-literacy/it-literacy-courses-in-associating-with-msup/computer-fundamentals>
- DOS: <https://www.geeksforgeeks.org/ms-dos-operating-system/>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) - 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

[Signature]

[Signature]
Suresh (Thakur)

[Signature]
Shailendra
Raj

[Signature]
Dr. S. Jain

[Signature]
Teaching
Ramesh

[Signature]

[Signature]
ANJEETA KUMAR

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Computer Application <i>(Certificate / Diploma / Degree/Honors)</i>	Semester – I/III/IV	Session: 2024-2025	
1	Course Code	CAVAC-01	
2	Course Title	Artificial Intelligence	
3	Course Type	Value Addition Course (VAC)	
4	Prerequisite	As per program	
5	Course Learning Outcomes(CLO)	At the end of this course, students will be able to: <ul style="list-style-type: none"> • Understand basics of AI. • Understand problem solving techniques of AI. • Aware about AI tools. • Explore application of AI in various domains. • Understand the current scenario of AI in India. 	
6	Credit Value	2 Credits	<i>Credit = 15 Hours -Learning & Observation</i>
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
PART – B: Content of the Course			
Total No. of Teaching– Learning Periods (01 Hr. per period) - 30 Periods (30 Hours)			
Unit	Topics (Course contents)		No .of Period
I	Introduction: Overview of Artificial Intelligence (AI), Foundations of AI, Areas and Applications of AI in various domains, AI in India, Impact and examples of AI, Future of AI.		8
II	Advanced AI: Basic Concept of Machine Learning, Deep Learning, Computer vision, Natural Language Processing (NLP), Speech recognition, Generative AI Applications.		8
III	AI Tools: Conversational AI: ALEXA, CORTANA, SIRI etc., AI tools for content generation, Image creation, Presentation, Video editing etc.		8
IV	Application of AI: Agriculture, Healthcare, Environment, Teaching-Learning, E-Commerce, Industry, Research etc.		6
Keywords	<i>Artificial Intelligence (AI), Machine Learning (ML), Deep Learning, Computer Vision, Natural Language Processing (NLP), Conversational AI, Generative AI.</i>		
Name and Signature of Convener & Members of CBoS:			
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;"> <p><i>Dr. H. S. Hota</i> Chairman</p> <p><i>Sushil</i></p> <p><i>Saurabh</i></p> </div> <div style="text-align: center;"> <p><i>Krishna</i></p> <p><i>Suresh Thakur</i></p> <p><i>Dr. V. K. Gupta</i></p> </div> <div style="text-align: center;"> <p><i>Yash</i></p> <p><i>Shreebansu Arya</i></p> <p><i>Tejash Kumar</i></p> </div> <div style="text-align: center;"> <p><i>Om</i></p> <p><i>ANJEETA KUMAR</i></p> </div> <div style="text-align: center;"> <p><i>Alka</i></p> <p><i>IMP</i></p> </div> <div style="text-align: center;"> <p><i>Akash</i></p> </div> </div>			

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Introduction to Artificial Intelligence and Expert Systems, Dan W. Patterson, PHI Publication.
- Artificial Intelligence, Elaine Rich and Kevin Knight TMH publication.

Reference Books Recommended:

- Artificial Intelligence and machine learning, Vinod Chandra S.S., Anand Hareendrn S., PHI learning private Ltd.
- Foundations of Artificial Intelligence and Expert Systems, Macmillan Series in Computer Science, V.S. Jankiraman, K. Sarukesi and P. Gopala Krishnan.

Online Resources:

- Ministry of Electronics and Information Technology Portal for INDIAai:
<https://indiaai.gov.in/>
Introduction to Artificial Intelligence from SWAYAM:
https://www.youtube.com/watch?v=pKeVMlkFpRc&list=PLwdnzlV3ogoXaceHrrFVZCJKbm_laSHcH&index=2
An introduction to Artificial Intelligence from SWAYAM:
https://onlinecourses.nptel.ac.in/noc24_cs08/preview
- Introduction to Artificial Intelligence from Coursera:
<https://www.coursera.org/learn/introduction-to-ai>
- Introduction to Artificial Intelligence:
<https://www.javatpoint.com/artificial-intelligence-ai>
- How to Learn Artificial Intelligence from Coursera:
<https://www.coursera.org/articles/how-to-learn-artificial-intelligence>

PART-D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA): 15 Marks

End Semester Exam(ESE): 35 Marks

Continuous Internal Assessment(CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 + 10	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
	Assignment/Seminar- 05 Total Marks - 15	

End Semester Exam (ESE):	Laboratory/Field Skill Performance: On spot Assessment	Managed by Coordinator as per skilling
	A. Performed the task based on learned skill - 20 Marks B. Spotting based on tools (Written) - 10 Marks C. Viva-voce (based on principle/technology)- 05 Marks	

Name and Signature of Convener & Members of CBoS:

 Chairman						
	 Secretary		 ANJALI KUMAR			

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Computer Application <i>(Certificate / Diploma / Degree/Honors)</i>		Semester – II/IV/V/VI	Session: 2024-2025
1	Course Code	CASEC-01	
2	Course Title	ICT Based Learning	
3	Course Type	SEC (Skill Enhancement Course)	
4	Prerequisite	<i>As per program</i>	
5	Course Learning Outcomes(CLO)	At the end of this course, students will be able to: <ul style="list-style-type: none"> • Understand the concept of ICT. • Understand the concept of Blended learning. • To provide knowledge about various OER resources • Create document using tools word, Google Docs • Learn about various Google tools. 	
6	Credit Value	2 Credits (1C+1C)	<i>Credit =15 Hours Theoretical Learning and = 30 Hours Laboratory or Field Learning/Training</i>
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20

PART – B: Content of the Course

Total No. of Teaching– Learning Periods (01 Hr. per period) - 30 Periods (30 Hours)

Unit	Topics (Course contents)	No. of Period
Theory Content	1. ICT in Education: Concept & Importance of ICT, Need of ICT in Education. 2. Blended Learning: Introduction, terminology, types of Blended Learning Models, Advantages and Disadvantages, Benefits of Blended Learning. 3. E-Learning and Web Based Learning: E-Learning, Web Based Learning, Virtual Classroom, EDUSAT. 4. Open Educational Resources: Introduction, Advantages & Disadvantages of OER, OER Tools Like Google Classroom, various OER.	15
Lab/Field Training Content	Presentation Tools – MS Word, MS Excel, MS PowerPoint, WPS Office. Google Tools- Google Forms, Google Classroom, Google Meet, Google Docs, Google Sheet, Google Slides. Meeting Management Tools- Different Types of Meeting Tools Like Google Meet, Zoom, Skype etc.	30

Keywords Blended Learning, Open Educational Resource, Google.

Name and Signature of Convenor & Members of CBoS:

Dr. H.S. Acharya  Chairman
 Ananta Kumar
 Ananta Kumar
 Ananta Kumar
 Ananta Kumar
 Ananta Kumar
 Ananta Kumar
 ANJEEETA KULJUA

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Agarwal J.P. (2013): Modern Educational Technology. Black Prints, Delhi.
- Barton,R.(2004).Teaching Secondary Science with ICT. McGraw Hill International.

Reference Books Recommended:

- Bhaskar Rao (2013): Samachara Prasara Sankethika vidya Shastramu, Masterminds, Guntur.
- Cambridge, D.(2010).E-Portfolios for Lifelong Learning and Assessment. John Wiley and Sons.

Online Resources:

- <https://www.unesco.org/en/communication-information/open-solutions/open-educational-resources>
- National Digital Library of India : <https://www.ndl.gov.in/>
- SWAYAM PORTAL: <https://www.swayam.gov.in>
- E-Gyankosh: <https://egyankosh.ac.in/>

PART-D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA): 15 Marks

End Semester Exam(ESE): 35 Marks

Continuous Internal Assessment(CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 + 10	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
	Assignment/Seminar- 05 Total Marks - 15	
End Semester Exam (ESE):	Laboratory/Field Skill Performance: On spot Assessment A. Performed the task based on learned skill - 20 Marks B. Spotting based on tools (Written) - 10 Marks C. Viva-voce (based on principle/technology)- 05 Marks	Managed by Coordinator as per skilling

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

Krishna

[Signature]

[Signature]

[Signature]

[Signature]

[Signature]

[Signature]
Suresh Thakur

[Signature]
Shri Venkatesh

[Signature]
Shri Venkatesh

[Signature]

[Signature]

[Signature]

[Signature]
ANJEETA KUMAR