





BCA Sixth Semester


Course Code / S. No.	Subject Name	Periods Per Week			Credits	Maximum Marks Theory Slot		Maximum Marks Practical Slot		Total Marks
		L	T	P		End Sem. Exam (External)	Tests (Two) /Assignment (Internal)	End Sem. Practical Performance / Viva	Practical Record / Presentation	
BCA-601 (Major-Core)	Computer Graphics & Multimedia	4	-	2	4	60	40	-	-	100
BCA-602 (Major-DSE-1)	Programming in C#	3	-	1	4	60	40	-	-	100
BCA-603 (Major-DSE-2)	Cyber Security	3	-	1	4	60	40	-	-	100
BCA-604 Skill/Vocational	Internship	3	-	1	4	-	-	60	40	100
BCAL-605	Computer Lab-I(Computer Graphics & Multimedia)	-	-	4	2	-	-	60	40	100
BCAL-606	Computer Lab-II (Programming in C#)	-	-	4	2	-	-	60	40	100
Skill-I	Skill Development	-	-	-	2	-	-	-	-	-
CVV	Comprehensive Viva- Voce	-	-	-	4 *(Virtual)	-	-	-	-	-
TOTAL		13	-	13	22+4	180	120	180	120	600











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24/01/24
 24/1/24

Bachelor of Computer Applications (BCA)

Examination Pattern

- ✓ End semester examination will contain three sections as A, B & C.
- ✓ Section-A will be of objective type
- ✓ Section- B will have short answers
- ✓ Section- C will consist of long answers.
- ✓ Marks distribution for all sections will be as follows:

Section- A 1*10 = 10 marks

Section- B 4*5 = 20 marks

Section- C 6*5 = 30 marks

----- Total
= 60 marks

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Part A Introduction

Subject: BCA
BCA-501

Course Code
1 Course Title
2 Data Warehousing & Mining (Theory)
(Group B - Paper-I)
3 Course Type (Core Course/
Discipline Specific/
Elective/Elective/Generic/
Elective/Vocational/...)
4 Pre-requisite (if any)
5 Course Learning outcomes (CLO)

On successful completion of this course, the students will be able to:

1. Understand the basics of data warehouse, its storage, fundamentals and knowledge discovery in databases
2. Apply data mining techniques over different datasets
3. Implement clustering algorithms and build classification models
4. Select appropriate DM tools and apply the concepts of Data Warehouse and DM techniques for clustering, association, and classification
5. Explore recent trends in data mining such as web mining, spatial-temporal mining.

6 Credit Value
7 Total Marks
Theory 4
Max Marks: 60 + 40
Min. Passing Marks: 55

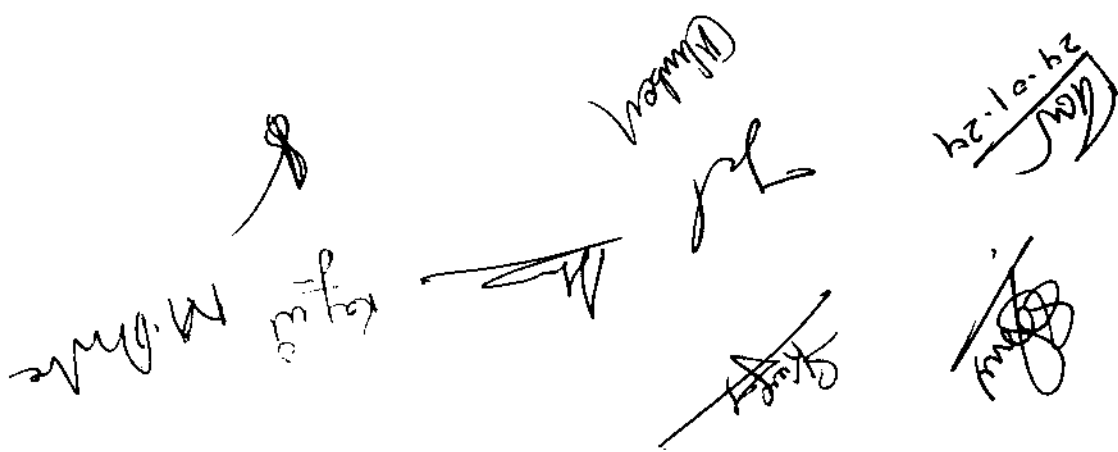
Part B- Content of the Course

Total No. of Lectures = 60 (3 hours: Lecture per week)

Unit
Topics
No. of Lectures
(1 Hour Each)

Unit	Topics	No. of Lectures (1 Hour Each)
I	Data Warehouse Basic: Data ware housing Definition usage and trends, DBMS vs. data warehouse, statistical databases vs. data warehouses, Data marts, Metadata Multidimensional data model Data cubes, Schemas for Multidimensional Databases stars, snowflakes and fact constellations	12
II	Storage and Architecture of Data Warehouse: Data warehouse process & architecture, OLTP vs. OLAP, ROLAP vs. MOLAP types of OLAP servers, 3 - Tier data warehouse architecture, distributed and virtual data warehouses, data warehouse manager, storage and consolidation, ware house internals, storage and indexing, Operations, materialized , online analytical	12

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Suggestive digital platforms web links
 1 <https://applied.in/courses/106105/174>
 2 <https://minicourses.wvuams.ac.in/cc20/cs/2/oreview>

Suggested Readings:

- 1 Data Mining: Concepts and Techniques, Han and Kamber, Morgan Kaufmann Publications
- 2 Data Mining Techniques, A. K. Pujari, Universities Press Pvt Ltd
- 3 Data Warehousing" by Animesh Sinha
- 4 Data Warehousing in the real world "by Sam Anahory, & Dennis Murray
- 5 Jiawei Han & Micheline Kamber: Data Mining - Concepts & Techniques;
- 6 Margaret H Dunham, 5 Srdhar:Data Mining Introductory and Advanced Topics
- 7 Pang-Ning Tan, Michael Steinbach, Vipin Kumar: Introduction to Data Mining
- 8 Kimball R Reeves L, Ross M etc - Data Warehouse life cycle tool kit, John Wiley.
- 9 Anahory: Data Warehousing in Real World, Addison Wesley
- 10 Adnaans: Data Mining, Addison Wesley;
- 11 Jayee Bischoff & Ted Alexander: Data Warehouse: Practical advice from the Expert, Prentice

Part C: Learning Resources
 Text Books, Reference Books, Other resources

Keywords/Tags:

- III Data Mining Basic: Data mining definition & task, KDD 12
 versus data mining, tools and applications, Data mining
 query languages, Preprocessing, pattern presentation &
 visualization, specification, data mining techniques, tools
 and applications
 Data mining techniques: Statistical perspective,
 Regression, Bayes Theorem, Hypothetical testing.
- IV Classification and Clustering, Issues in classification 12
 Statistical -Based Algorithms, Distance-Based
 Algorithms, Decision Tree-Based Algorithms ID3,C4.5
 Evaluating the performance
 Clustering, Basic concepts, Partition algorithms
 Agglomerative Hierarchical algorithms, DBSCAN,
 BIRCH, CORE algorithm Clustering with categorical
 attributes, Comparison
 Association Rules: Frequent Itemset generation, Apriori 12
 Algorithm, Rule generation, Compact representation of
 frequent Itemset,
 Advanced Topics: Dimensionality Reduction, overview of
 Principle Component Analysis and SVD, Spatial mining,
 Web mining, Temporal mining

3 <http://www.informatica.com/data-mining/index.htm>

4 <http://www.faircat.com/data-warehouse>

Suggested equivalent online courses:

1 <http://www.udacity.com>

2 <http://www.coursera.org/series/collections/data-mining>

3 <https://www.coursera.org/learn/data-mining>

4 <https://www.classcentral.com/sdb/et/data-mining>

Part D-Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100

Continuous Comprehensive Evaluation (CCE): 0 Marks University Exam (UE): 60 Marks

Internal Assessment: Continuous Class Test Assignment/Presentation

Comprehensive Evaluation (CCE)

External Assessment:

Section(A): Very Short Questions

Section (B): Short Questions

Section (C): Long Questions

Time: 03.00 Hours

Any remarks/suggestions:

40
60

Practical Paper

Part A Introduction

Program: Degree Class BCA Semester: V Session: 2023-24

Subject: BCA

BCAL-505

Data Warehousing & Mining (Practical)

(Group B - Paper-I)

Discipline Specific Elective

3 Course Type (Core Course/ Discipline Specific Elective/ Elective/Vocational/ ...)

4 Pre-requisite (if any)

5 Course Learning outcomes (CLO)

- On successful completion of this course, the students will be able to:
1. Understand the basics of data warehouse its storage fundamentals and knowledge discovery in databases
 2. Apply data mining techniques over different datasets
 3. Implement clustering algorithms and build classification models
 4. Select appropriate DM tools and apply the

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concepts of Data Warehouse and OM techniques for clustering, association, and classification

5. Explore recent trends in data mining such as web mining, spatial-temporal mining.

6 Credit Value 7 Total Marks

2 Max. Marks 100 Min. Passing Marks:35

Part B- Content of the Course

Total No. of Lectures = 30 (2 hours/ lecture per week)

No. of Lectures (2 Hour Each)

1. Installing Weka and understanding Weka environment using inbuilt functions
2. Loading and importing different types of datasets in Weka
3. Implement attribute selection and visualization in Weka
4. Perform ETL operation over data set.
5. Apply various data pre-processing techniques over the data sets.
6. Create a data mart from a data warehouse and apply data cleaning operations.
7. Build a classification model to classify data using Naive Bayes algorithm
8. Build a classification Model using different decision tree algorithm.
9. Apply regression to make marketing forecasts over sales data
10. Implement clustering algorithm over different data sets
11. Apply Apriori algorithm to find out association rules in data set.
12. Evaluate the performance of different classifier
13. Analyse the performance of various clustering algorithms.
14. Build a classifier to identify diabetic and non diabetic patients
15. Analyze the IRIS dataset in Weka and apply suitable data mining technique

Part C : Learning Resources

Text Books, Reference Books, Other resources

Suggested Readings:

1. Data Mining Concepts and Techniques, Han and Kamber, Morgan Kaufmann Publications.
2. Data Mining Techniques A K Pujari, Universities Press Pvt. Ltd
3. Data Warehousing" by Amitesh Sinha
4. Data Warehousing in the real world "by Sam Anahory & Dennis Murray
5. Jiawei Han & Micheline Kambe: Data Mining - Concepts & Techniques;
6. Margaret H Dunham, S. SridharData Mining Introductory and Advanced Topics
7. Pang-Ning Tan, Michael Steinbach Yipin Kumar Introduction to Data Mining
8. Kimball R. Reeves L. Ross M etc -Data Warehouse life cycle tool kit, John Wiley.
9. Anahory: Data Warehousing in Real World, Addison Wesley
10. Adrans: Data Mining, Addison Wesley.
11. Jayce Bischoff & Ted Alexander : Data Warehouse: Practical advice from the expert, Prentice Hall, New Jersey.

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2. Suggestive digital platforms web links
1. <https://n2l.ac.in/courses/106105174>
2. <https://onlinecourses.wwayam2.ac.in/ec20/cs12/greview>
3. [https://www.tutorials\[dot\]co\[dot\]ll/data-mining/index.htm](https://www.tutorials[dot]co[dot]ll/data-mining/index.htm)
4. <http://www.javatpoint.com/data-warehouse>

Suggested equivalent online courses:

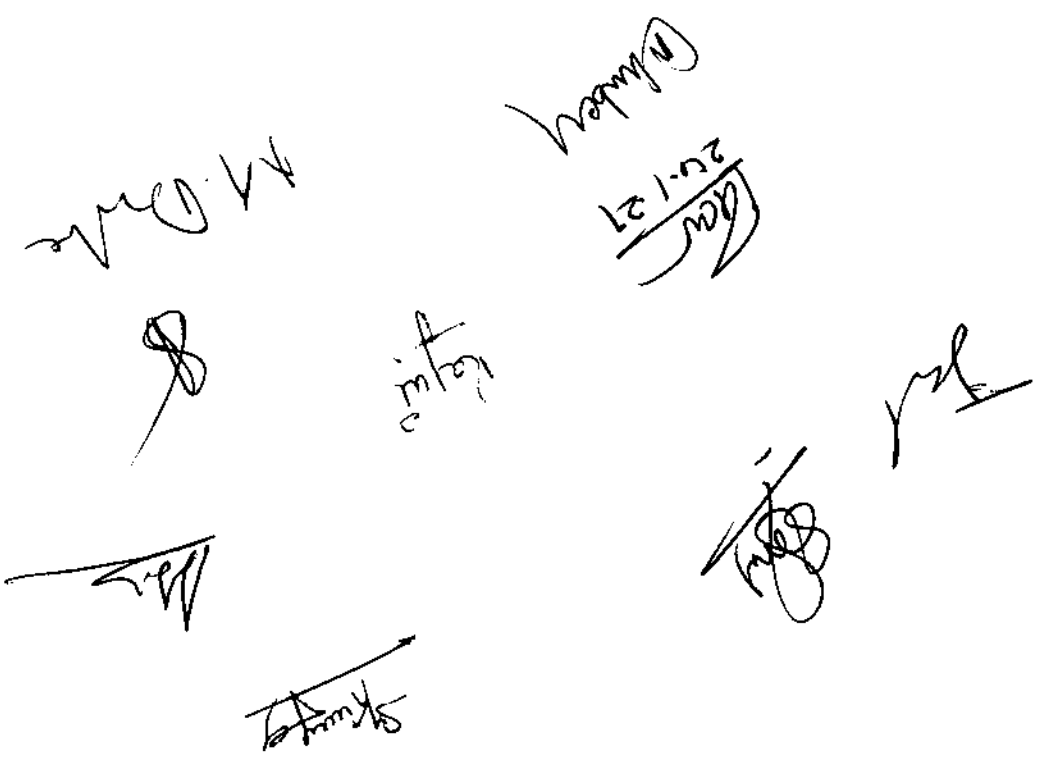
- 1. <https://www.udacity.com>
- 2. <https://www.coursera.org/specializations/data-mining>
- 3. <https://www.watdx.org/cam/data-mining>
- 4. <https://www.classcentral.com/subject/data-mining>

Part D-Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Marks	Internal Assessment	External Assessment	Marks
40	Class Interaction Quiz Attendance	Viva Voce on Practical Practical Record File	60
Total Marks : 100			



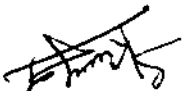


Assignments (Charts Model Seminar / Rural Service Technology Dissemination Report of Excursion Lab Visits Survey / Industrial visit)




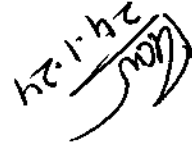


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Theory Paper

Part A Introduction		
Program: Degree	Class: BCA	
Semester: V	Session: 2023-24	
Subject: BCA		
1	Course Code	BCA-502
2	Course Title	Python Programming (Theory) (Group A - Paper-II)
3	Course Type (Core Course/ Discipline Specific Elective/ Generic Elective/Vocational/.....)	Discipline Specific Elective (DSE-2) Major
4	Pre-requisite (if any)	
5	Course Learning outcomes (CLO)	On successful completion of this course, the students will be able to: 1. Develop and execute simple Python programs. 2. Structure a Python program into functions. 3. Using Python lists, tuples to represent compound data 4. Develop Python Programs for file processing
6	Credit Value	4
7	Total Marks	Max. Marks: 40+60 Min. Passing Marks: 35
Part B- Content of the Course		
No. of Lectures (in hours per week): 3 Hrs. per week Total No. of Lectures: 60 Hrs.		
	Module	Topics
Unit - I	14	What is Python? WHY PYTHON? History, Features - Dynamic, Interpreted, Object oriented, Embeddable, Extensible, Large standard libraries, Free and Open source, Download & Python Installation Process in Windows, Unix, Linux and Mac, Online Python IDE, Python Realtime IDES like Spyder, Jupyter Note Book, PyCharm, Rodeo, Visual Studio Code, ATOM, PyDevic, Data Types and Variables, Numbers, Operators Comments in Python, Input output operation in python
Unit - II	10	Control Statements: Conditional control statements - if, if- else, if-elif-else, Loop control statements- for, while, Data Structure & Collection:-String, List, Tuple, Set, Dictionary, Comparison of List, Tuple and Set, Function in python, types of function in python, map, reduce, filter function, Lambda Function






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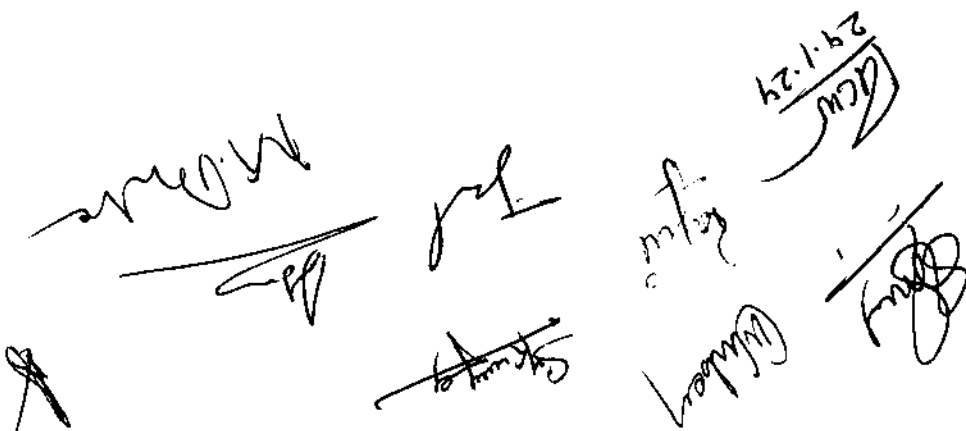
S.No.	Online Course	Duration	Plate-form
Suggested equivalent online courses:			
1.	www.javapoint.com		
2.	www.w3school.com		
3.	www.python.org		
4.	https://www.tutorialspoint.com/python/index.htm		
Suggestive digital platforms/ web links:			
<p>1. Python Crash Course: A Hands-On, Project-Based Introduction to Programming (2nd Edition) Author: Eric Matthes.</p> <p>2. The Python Language Reference Manual (version 3.2), Guido van Rossum, and Fred L. Drake, Jr. (Editor). ISBN: 1906966141, Network Theory Ltd, 120 pages (Revised November 2006)</p>			
Reference Books:			
<p>1. Mark Lutz, Learning Python</p> <p>2. Tony Gaddis, Starting Out With Python</p> <p>3. Kenneth A. Lambert, Fundamentals of Python</p> <p>4. James Payne, Beginning Python using Python 2.6 and Python 3.2</p> <p>5. मध्य प्रश्न लिखी प्रश्न उत्तरों की पुस्तक।</p>			
Suggested Readings:			
Text Books, Reference Books, Other resources			
Part C-Learning Resources			
Keywords/Tags: Open Source, Data Type, Module, List, Tuples, Directory			
Unit - V	<p>12 Multithreading and multiprocessing in python, Threading module, Creating thread - inheriting Thread class, Using callable object, Life cycle of thread, Single threaded application, Multithreaded application, Can we call run() directly? Need to start() method, Sleep() & Join(), Synchronization - Lock class - acquire(), release() functions, Garbage collection, Python Data Base Communications (PDBC), Introduction of Numpy, Pandas & Matplotlib, Drawing plots.</p>		
Unit - IV	<p>12 Procedural vs Object oriented programming, Principles of OOP - Encapsulation, Abstraction (Data Hiding), Polymorphism, Inheritance, Inner Classes, Exception handling and types of errors, try, except, finally, raise, and Need to Custom exceptions, Case studies, regular expression.</p>		
Unit - III	<p>12 Importance of modular programming, What is module? Types of Modules - Pre defined, User defined, User defines module creation, OS, Date-time, math modules, organizing python project into packages, Types of packages - pre defined, user defined, Package v/s Folder, File and Directory handling in Python.</p>		


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(1)	Joy of Computing using Python https://nptel.ac.in/courses/106106182	12 Weeks	NPTL
(2)	Complete Python course https://www.udemy.com/topic/python/	12 Weeks	Udemy
Part D-Assessment and Evaluation			
Suggested Continuous Evaluation Methods:			
Maximum Marks : 100			
Continuous Comprehensive Evaluation (CCE) : 40 Marks University Exam (UE): 60 Marks			
Internal Assessment : Continuous Comprehensive Evaluation (CCE)		Class Test Assignment/Presentation	
External Assessment : University Exam Section		Section (A) : Very Short Questions Section (B) : Short Questions Section (C) : Long Questions	
Time : 03.00 Hours		60	
Any remarks/ suggestions:			

Practical Paper

Part A Introduction			
Program: Degree		Class: BCA	
Semester: V		Session: 2023-24	
Subject: Computer Application			
1	Course Code	BCAL-506	
2	Course Title	Python Programming (Practical) (Group A - Paper-II)	
3	Course Type (Core Course/ Discipline Specific Elective/ Elective/ Generic Elective /Vocational/....)	Discipline Specific Elective (DSE)	
4	Pre-requisite (if any)	To study this course, a student must have basic Logical, and analytical skills.	
5	Course Learning outcomes (CLO)	On successful completion of this course, the students will be able to:	
6	Credit Value	2	
7	Total Marks	Max. Marks: 100 Min. Passing Marks: 35	
Part B-Content of the Course			
Number of Lab Practicals (in hours per week): 2 Hours Per Week			



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Total No. of Lab : 30 (Each Lab of 2 Hours)



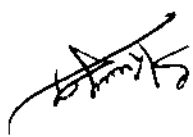
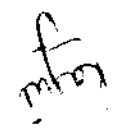



No. of Labs: 30
(2 Hours Each)

Suggestive List of Practical
Students are required to write program(Code) in
Python, execute and test it

1. Write a program to demonstrate different number data types in Python.
2. Write a program to perform different Arithmetic Operations on numbers in Python.
3. Write a program to create, concatenate and print a string and accessing sub-string from a given string.
4. Write a python script to print the current date in the following format a. "Fri Oct 11 02:26:23 IST2019"
5. Write a program to create, append, and remove lists in python.
6. Write a program to demonstrate working with tuples in python.
7. Write a program to demonstrate working with dictionaries in python.
8. Write a python program to find largest of three numbers.
9. Write a Python program to construct the following pattern, using a nested for loop


```

      *
      **
      ***
      ****
      *****
      ****
      ***
      **
      *
      
```
10. Write a Python script that prints prime numbers less than 20.
11. Write a python program to define a module to find Fibonacci Numbers and import the module to another program.
12. Write a python program to define a module and import a specific function in that module to another program.
13. Write a program that inputs a text file. The program should print all of the unique words in the file in alphabetical order.








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14. Write a Python class to convert an integer to a roman numeral.		15. Write a Python class to reverse a string word by word.	
Keywords/Tags: Open Source, Data Type, Module, List, Tuples, Directory, Loops, Array			
Part C-Learning Resources Text Books, Reference Books, Other resources			
Suggested Readings: 1. Mark Lutz, Learning Python 2. Tony Gaddis, Starting Out With Python 3. Kenneth A. Lambert, Fundamentals of Python 4. James Payne, Beginning Python using Python 2.6 and Python 3.2 5. मय प्रथम डिप्टी ग्रंथ आकर्षक की पुस्तकें Suggestive digital platforms/ web links: 1. www.javaatpoint.com 2. www.w3school.com 3. www.python.org 4. https://www.tutorialspoint.com/python/index.htm			
Suggested equivalent online courses:			
S.No.	Online Course	Duration	Plate-form
01	Joy of Computing using Python https://nptel.ac.in/courses/106106182	12 Weeks	NPTEL
02	Complete Python course https://www.udemy.com/topic/python/	12 Weeks	Udemy
Part D-Assessment and Evaluation Suggested Continuous Evaluation Methods:			
Internal Assessment		Marks	External Assessment
Class Interaction Quiz		40	Viva Voce on Practical
Attendance			Practical Record File
Assignments (Charts, Model Seminar, Rural Service Technology, Dissemination, Report of Excursion, Lab Visits, Survey / Industrial visit)			Table work / Experiments
Total Marks : 100			
Any remarks/ suggestions:			

Course Code
 Course Title
 Course Type
 Pre-requisite (if any)

BCA-503

DIGITAL MARKETING

BCA

Open for All

Course Learning
 outcomes (CLO)

After the successful completion of the course, the student shall be able to:-

- Understand digital marketing, importance thereof, meaning of web site and levels of web site, difference between blog, portal & website.
- Understand the working of SEO (search engine optimization) on page optimization, off page optimization, and will learn to prepare reports
- Learn about SMO (social media optimization) like Face book, twitter, LinkedIn, Tumblr, Pinterest and other social media services optimization
- Understand paid tools like Google ad words, display advertising techniques
- Learn and apply hands on experience on tools useful to SEO for analysis on website traffic, keyword analysis and learn email marketing and ad designing.

Expected Job Role /
 career opportunities

- Digital Marketing Manager
- Search Engine Optimizer
- Social Media Marketer
- Content Marketer
- Content creator for AR-VR (Augmented Reality - Virtual Reality)
- SEO Specialist for voice assistance

Credit Value

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I	Introduction to Digital Marketing:	10
	Meaning of Digital Marketing, Differences from Traditional Marketing, Return of Investments on Digital Marketing vs. Traditional Marketing, E Commerce, Tools used for successful marketing, SWOT Analysis of Business for Digital Marketing, Meaning of Blogs, Websites, Portal and Their Differences, Visibility, Visitor Engagement, Conversion Process, Retention, Performance Evaluation	
	<i>Keywords: Titles, Meta Tags</i>	
II	Search Engine Optimization (SEO):	10
	On page Optimization Techniques, Off Page Optimization Techniques, Preparing Reports, Creating Search Campaigns, Creating Display Campaigns.	
	Social Media Optimization (SMO):	
III	Introduction to Social Media Marketing, Advanced Facebook Marketing, Word press Blog Creation, Twitter Marketing, LinkedIn Marketing, Instagram Marketing, social media Analytical Tools.	
	<i>Keywords: Google, Wordpress, FB, LinkedIn, Instagram, Analytics, SMO, Verbal Communication, Non- Verbal Communication, Intra personal and Interpersonal communication.</i>	
IV	Search Engine Marketing:	10
	Meaning and Use of Search Engine Marketing, Tools used - Pay Per Click, Google Adwords, Display Advertising Techniques, Report Generation	
V	Website Traffic Analysis, Affiliate Marketing and Ad Designing:	
	Google Analytics, Online Reputation Management, Email Marketing, Affiliate Marketing, Understanding Ad Words Algorithm, Advertisement Designing.	
	<i>Keywords: PPC, Google Ad words, Reports, SEM, Google Analytics, Ad Design, Social Media, Affiliate</i>	

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- Design SEO To improve page rank of our college.
- Monitor traffic of your website using google analytics.
- Using search engine submission improves online recognition and visibility of websites.
- Designing a blog
- Use of cross linking
- On/Off optimization of the website.
- Design Back link and outbound link of website.
- Web Development, Audio Video Production,
- Digital Content Creation, Product & Sales review analysis

Text Books, Reference Books, Other resources

Suggested Readings:

1. Textbooks:

1. Ahuja Vandana Digital Marketing: Oxford University Press (2016) ISBN: 9780199455447,
2. SainyKomi, NargundkarRajendra Digital Marketing: Cases from India, Notion Press (2018) ISBN 9781644291931, 1644291932

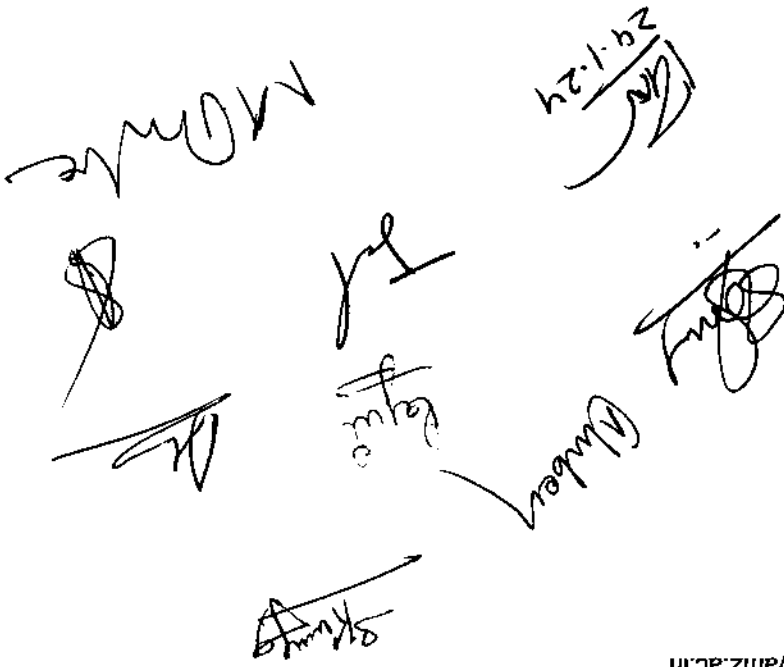
2. Suggestive digital platforms web links:

<https://www.wordstream.com/linkbuilding#:~:text=Building%20links%20is%20one%20of%20the%20most%20useful%20digital%20marketing%20links%20to%20your%20site>

<https://www.targetinternet.com/the-top-32-most-useful-digital-marketing-links/https://digitalmarketingphillippines.com/8-strategic-steps-to-natural-link-building/https://www.the-web-guvs.com/digital-marketing/>

Suggested equivalent online courses:

<https://onlinecourses.swayam2.ac.in>



Program: Degree		Class : BCA		Semester - VI		Session: 2023-24	
Part A Introduction							
Course Code		BCA-601					
Course Title		Computer Graphics (Theory) (Group A - Paper-I)					
Course Type (Core Course/ Discipline Specific Elective/ Generic Elective /Vocational/....)		Discipline Specific Elective (DSE) Major					
Pre-requisite (if any)		None					
Course Learning outcomes (CLO)		On successful completion of this course, the students will be able to:					
Credit Value		4					
Total Marks		Max. Marks: 40+60		Min. Passing Marks: 35			
Part B- Content of the Course							
No. of Lectures (in hours per week): 3 Hrs. per week							
Total No. of Lectures: 60 Hrs.							
Module		Topics		No. of Lectures (1 Hour Each)		Unit-I	
6		Introduction to Computer Graphics: Application of Computer Graphics, Interactive and Passive Graphics.		12		Unit-I	
7		Input-Output Devices: Input Devices, Trackball, Light Pen, Image Scanner, Output Devices, Plotters.		12		Unit-I	

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Unit -11	12	<p>Scan Conversion a line: Scan Conversion Definition, Scan Converting a Point, Scan Converting a Straight Line, DDA Algorithm.</p> <p>Scan Conversion Circle: Defining a Circle, Defining a Circle using Polynomial Method, Defining a Circle using Polar Coordinates Method, Bresenham's Circle Algorithm, Midpoint Circle Algorithm.</p> <p>Scan Converting Ellipse: Scan converting an Ellipse, Polynomial Method, Trigonometric Method, Midpoint Ellipse Algorithm</p>
Unit - III	12	<p>Filled Area Primitives: Boundary Fill Algorithm, Flood Fill Algorithm.</p> <p>2D Transformations: Introduction of Transformation, Translation, Scaling, Rotation, Reflection, Shearing, Matrix Representation, Homogeneous Coordinates, Composite Transformation, Pivot Point Rotation.</p> <p>2D-Viewing: Window, Window to Viewport Co-ordinate Transformation, Zooming, Panning.</p>
Unit -IV	12	<p>Clipping Techniques: Clipping, Point Clipping, Line Clipping, Midpoint Subdivision Algorithm, Text Clipping, Polygon, Sutherland-Hodgeman Polygon Clipping, Weiler-Atherton Polygon Clipping.</p> <p>Pointing & Positioning: Pointing & Positioning Techniques, Elastic or Rubber Band Techniques, Dragging.</p> <p>Shading: Introduction of Shading, Constant Intensity Shading, Gouraud shading, Phong Shading.</p>
Unit V:	12	<p>Animation: Animation, Application Areas of Animation, Animation Functions.</p> <p>3D Computer Graphics: Three Dimensional Graphics, Three Dimensional Transformations, Scaling, Rotation, Rotation about Arbitrary Axis, Inverse Transformations, Reflection, Shearing</p> <p>Hidden Surfaces: Hidden Surface Removal, Back Face Removal Algorithm, Z-Buffer Algorithm, Painter's Algorithm, Scan Line Algorithm, Subdivision Algorithm.</p>
<p>Keywords/Tags: Graphic Systems, Input-Output Devices, Scan Conversion, 2D Transformations, 2D-Viewing, Clipping Techniques, Shading, Animation, 3D Computer Graphics, Hidden Surfaces.</p> <p>Part C-Learning Resources</p> <p>Text Books, Reference Books, Other resources</p>		
<p>Suggested Readings:</p> <ol style="list-style-type: none"> 1. Hearn: Computer Graphics C Version, Pearson Education India: 2nd edition, 2002. 2. John Hughes, Andries van Dam, Morgan McGuire, David Sklar, James Foley: Computer Graphics: Principles and Practice, Addison-Wesley Professional, 3rd edition, 2013. 3. Zhiqiang Xiang, Roy Plastock: Computer Graphics, McGraw Hill Education, 2nd edition, 2006. 4. मध्य प्रदेश शिक्षा आयोग की वेबसाई 		

Reference Book: 1. James D. Foley; Andries van Dam; Steven K. Feiner; John F. Hughes: Introduction to Computer Graphics; Addison Wesley; 1993. 2. Chopra Dr. Rajiv; Computer Graphics, S Chand & Co Ltd. 3. Desai; Computer Graphics, PHI, 2008. 4. Ashana, R.G.S.; Computer Graphics for Scientists and Engineers, New Age International Pvt Ltd.	
Suggested Digital Platforms Web links: https://www.eshtksha.mp.gov.in/mpdhe https://epgp.inflibnet.ac.in	
Suggested equivalent online courses: https://nptel.ac.in/courses/106103224 https://nptel.ac.in/courses/106106090	
Suggested Continuous Evaluation Methods: Maximum Marks : 100 Continuous Comprehensive Evaluation (CCE) : 40 Marks University Exam (UE) : ... Marks 60	
Internal Assessment : Continuous Comprehensive Evaluation (CCE) Class Test Assignment/Presentation	40
External Assessment : University Exam Section Time : 03.00 Hours Section (A) : Very Short Questions Section (B) : Short Questions Section (C) : Long Questions	60
Any remarks/ suggestions:	

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Part A Introduction			
Program: Degree	Class: BCA	Semester: VI	Session: 2023-24
Course Code	Subject: BCA		
1	BCAL-605		
2	Course Title	Computer Graphics (Practical) (Group A - Paper-I)	
3	Course Type (Core Course/ Discipline Specific Elective/ Generic Elective/ Vocational/....)	Discipline Specific Elective (DSE)	
4	Pre-requisite (if any)	None	
5	Course Learning outcomes (CLO) to:	On successful completion of this course, the students will be able to:	
6	Credit Value	2	
7	Total Marks	Max. Marks: 100	Min. Passing Marks: 35
Part B- Content of the Course			
1.	Understand the basics of computer graphics, different graphics systems and applications of computer graphics.		
2.	Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.		
3.	Use of geometric transformations on graphics objects and their application in composite form.		
4.	Extract scene with different clipping methods and its transformation to graphics display device.		
5.	Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.		
6.	Render projected objects to naturalize the scene in 2D view and use of illumination models for this.		

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Total No. of Lectures-Tutorials-Practical (in hours per week):

L-T-P: 0-0-1

Unit	Topics	No. of Lectures (2 Hours Each)
	<p>List of Practicals:</p> <ol style="list-style-type: none"> 1. Write a Program to draw basic graphics construction like line, circle, arc, ellipse and rectangle. 2. Write a program of Translation, Rotation, and Scaling using Composite Transformation. 3. Write a program to draw a Circle using midpoint implementation Method. 4. Write a program to draw Bezier curve. 5. Program to rotate a rectangle about its midpoint. 6. Program to clip a line using Liang Barsky Method. 7. Program to implement Standard Perspective Projection in 3-Dimensions. 8. Program to implement Parallel Projection in 3-Dimensions. 9. Write a Program to implement Digital Clock. 10. Write a Program to draw animation using increasing circles filled with different colors and patterns. 11. Write a Program control a ball using arrow keys. 12. Write a Program to implement Bouncing Ball in vertical direction. 	30

Keywords/Tags:

Part C-Learning Resources

Text Books, Reference Books, Other resources

Suggested Readings:

Textbooks:

1. Hearn: Computer Graphics C Version, Pearson Education India: 2nd edition, 2002.
2. John Hughes, Andries van Dam, Morgan McGuire, David Sklar, James Foley: Computer Graphics: Principles and Practice, Addison-Wesley Professional, 3rd edition, 2013.
3. Zhiqiang Xiang, Roy Plasterock: Computer Graphics, McGraw Hill Education, 2nd edition, 2006.
4. मध्य प्रदेश विद्यापीठ अकादमी की वेबसाईट।

Reference Book:

Handwritten signatures and dates:

- 24-1-24
- John
- Quibben
- Stacy
- for
- M. G. M.

1. James D. Foley; Andries van Dam, Steven K. Feiner, John F. Hughes: Introduction to Computer Graphics, Addison Wesley, 1993.
2. Chopra Dr. Rajiv: Computer Graphics, S Chand & Co Ltd.
3. Desai: Computer Graphics, PHI, 2008.
4. Asthana, R.G.S.: Computer Graphics for Scientists and Engineers, New Age International Pvt Ltd.



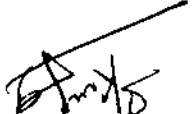




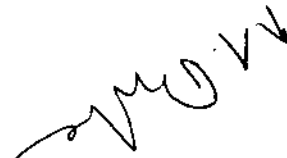
Suggestive digital platforms/ web links:
<https://www.eshiksha.mp.gov.in/mpdhe>
<https://epgp.infinet.ac.in>

Suggested equivalent online courses:
<https://nptel.ac.in/courses/106103224>
<https://nptel.ac.in/courses/106106090>

Part D-Assessment and Evaluation
Suggested Continuous Evaluation Methods:

Internal Assessment		External Assessment		Marks	
Class Interaction/Quiz		Viva Voce on Practical		40	
Attendance		Practical Record File		60	
Assignments (Charts- Model Seminar / Rural Service/ Technology Dissemination/ Report of Excursion/ Lab Visits/ Survey / Industrial visit)		Table work / Experiments		Total Marks : 100	

Any remarks/ suggestions:


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Part A Introduction

BCA-602

Programming in C#

(Theory)
DSE: 1

1	Course Code	BCA-602
2	Course Title	Programming in C#
3	Course Type (Core Course/ Discipline Specific Elective/ Elective/ Generic Elective /Vocational/ ...)	DSE: 1
4	Pre-req uisite (if any)	
5	Course Learning outcomes (CLO)	

- On successful completion of this course, the students will be able to:
1. Knowledge of the structure and model of the programming language C#.
 2. Determine logical alternatives with C# decision structures utilizing iteration, class methods, fields, and properties.
 3. Using the programming language C# for various programming technologies (understanding)
 4. Develop software in C#.
 5. Evaluate user requirements for software functionality required to decide whether the programming language C# can meet user requirements.
 6. Use of certain technologies by implementing them in the C# programming language to solve the given problem.

6	Credit Value	4
7	Total Marks	Max. Marks: 60 + 40 Min. Passing Marks: 35

Part B- Content of the Course

No. of Lectures (in hours per week): 3 Hrs. per week
Total No. of Lectures: 60 Hrs.

Module	Topics	No. of Lectures
Unit-I	Introduction to C#: What is C#, C# vs C, Java vs C# History, Features, Variables, Data Types, Operators, Keywords, Comments, C# Control Statements: if-else, switch, For Loop, While Loop, Do-While Loop, Break, Continue, Goto.	12
Unit-II	C# Functions: Function, Call By Value, Call By Reference, Out Parameter, C# Arrays: Array to Function, Multidimensional Array, Jagged Arrays, Params, Array, class, Command Line Args, C# Objects and Classes: Constructor, Destructor, this, static, static class, static constructor, Structs, Enum.	12

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Suggested Continuous Evaluation Methods:
 Maximum Marks: 100
 Continuous Comprehensive Evaluation (CCE) 40 Marks University Exam (UE)
 Internal Assessment: Continuous
 Comprehensive Evaluation (CCE)
 External Assessment:

Reference Book:
 1. Bill Wagner: Effective C++, Pearson Education, Third edition, 2017.
 2. Doyle B: C++ Programming From Problem Analysis To Program Design, Cengage, 2014.
 3. S. Thamarai Selvi, R. Murgesan: A TextBook on C++, Pearson Education India, 2003.
 4. MILES: Begin to Code with C++, PHI Learning.
 Suggested Digital Platforms Web links:
 http://www.eshiksha.rmp.gov.in/impdhe
 Suggested equivalent online courses:
 https://let.itk.ac.in/courses/introduction-to-c-sharp

Textbooks:
 1. E Balagurusamy: Programming in C++, McTraw Hill Education, 4th edition, 2017.
 2. Joydip Kanjilal: Mastering C++ 8.0, BPB Publication, 2019.
 3. J.G.R. Sathiaselvan: Programming With C Sharp, Net, PHI Learning, 2009.

Suggested Readings:
 Text Books, Reference Books, Other resources
Part C-Learning Resources
 C# Synchronization, C# Web Service,
 C# Inheritance, C# Polymorphism, C# Abstraction, C# Namespace, C# Strings, C# Multithreading,
 Introduction to C++, C# Control Statements, C# Functions, C# Arrays, C# Objects and Classes,
 Keywords/Tags:

Unit -IV	C# Strings, C# Exceptions: Exception Handling: try catch, finally, Custom Exception, checked unchecked, System Exception, C# File I/O: FileStream, StreamWriter, StreamReader, TextWriter, TextReader, BinaryWriter, BinaryReader, StringWriter, StringReader.	12
Unit V:	C# Multithreading: Multithreading, Thread Life Cycle, Thread class, Main Thread, Thread Sleep, Thread Abort, Thread Join, Thread Name, ThreadPriority, C# Synchronization, C# Web Service.	12
Unit -III	C# Properties, C# Inheritance: Inheritance, Aggregation, C# Polymorphism: Member Overloading, Method Overriding, Base, Polymorphism, Sealed, C# Abstraction: Abstract, Interface, C# Namespace: Namespace, Access Modifiers, Encapsulation.	12

Section(A) : Very Short Questions
 Class Test Assignment/Presentation
 60 Marks
 40

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 M. O. M. K.

1	Course Code	2	Course Title	3	Course Type (Core Course / Elective/ Generic Elective / Vocational/)	4	Pre-requisite (if any)	5	Course Learning outcomes (CLO)
On successful completion of this course, the students will be able to:									

1. Knowledge of the structure and model of the programming language C #.
2. Determine logical alternatives with C- decision structures utilizing iteration, class methods, fields, and properties.
3. Using the programming language C # for various programming technologies (understanding)
4. Develop software in C #.
5. Evaluate user requirements for software functionality required to decide whether the programming language C # can meet user requirements.
6. Use of certain technologies by implementing them in the C # programming language to solve the given problem.

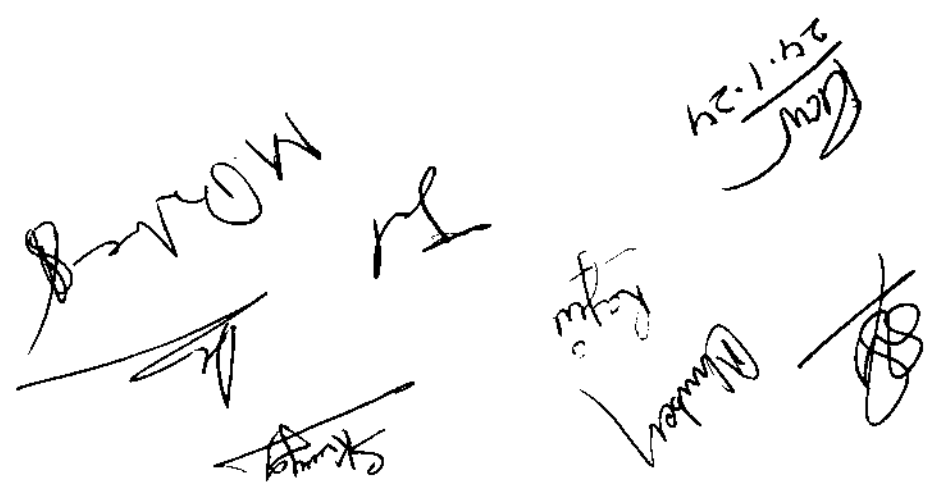
6	Credit Value	7	Total Marks
2	100	2	Passing Marks:35

Part B-Content of the Course

Total No. of Lectures-Tutorials-Practical(in hours per week): I-T-P0-0-1
 No. of Lectures-30
 (2 Hours Each)

List of Practicals:

1. Write a C# program to print Fibonacci series without using recursion and using recursion.
2. Write a C# program to check prime number.
3. Write a C# program to check palindrome number.
4. Write a C# program to print factorial of a number.



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Unit	Topics	No. of Lectures (Hour Each)
I	Investigation and Ethics: Cybercrime, types of cyber crimes/trauds, cyber frauds in India, Cyber jurisdiction, Ethical issues in data and software privacy, Plagiarism, pornography, Tampering computer documents/system hacking, Data privacy and protection, social engineering and Phishing, Types of social engineering, exploring methods of phishing; Issues in ethical hacking, Internet security threats: Hacking and Cracking, Malicious code, Viruses, Worms, Trojan Horses; certifying authorities need and power, appointment function, generation, suspension and revocation of certifying authorities; cyber crime forensic.	18
II	Cryptography: Understanding Cryptography and Encryption, Private Key Encryption, Public Key Encryption, Secret-Key Encryption, Firewalls, Types of Firewall Techniques, How to identify a Firewall.	18
III	Information Security: Information system, Information Systems, Computer Literacy and IS Literacy, IS Components, Trends in IS, Classification of IS Framework of IS in an Organization, IS and Business Organization, Developing Information System, Introduction to various models, Role of security in internet and web services, securing web services, principles of information security, ISMS and its benefits, classification of Threats and attacks, Security implication for organizations, information classification and their roles, access	18

Program: Degree		Class: BCA Semester: VI		Session: 2023-24	
Subject: BCA					
1	Course Code	BCA-603			
2	Course Title	Cyber Security			
3	Course Type (Core Course/ DSE)	Discipline Specific			
4	Pre-requisite (if any)	Elective/Optional/.....			
5	Course Learning Outcomes (CLO)	On successful completion of this course, the students will be able to: 1. Identify the key components of cyber security network architecture. 2. Employ, design and implement appropriate security technologies and policies to protect computers and digital information 3. Analyze threats and risks within context of the cyber security architecture. 4. Apply cyber security architecture principles. 5. Gain familiarity with prevalent network and distributed system attacks.			
6	Credit Value	6			
7	Total Marks	Max Marks: 40+60		Min. Passing Marks: 35	
Part B- Content of the Course					
T-P: Total No. of Lectures-90 Tutorials-Practical (hours per week): 4-0-1					

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Keywords/Tags:	
control, authentication of hosts, vulnerability, stages of vulnerability management.	
IV	Security in E-Commerce: E-Commerce Issues of privacy, Security Threats to E - Commerce, Access Control: Biometrics, Benefits, Criteria for selection of Biometrics, Digital Signatures: Applications of Digital Signatures.
V	Cyber Law: Fundamentals of Cyber Law, History of Internet, Introduction to Indian Cyber Law, Need for Cyber Laws, Jurisprudence of Cyber Law, Objective and Scope of the IT Act 2000, Intellectual property issues, Enforcement of IPRS, Non patentable Procedure for Obtaining Patent, Copyright, Trademark Law, Law related to semiconductor layout and design.
Part C-Learning Resources	
TextBooks, Reference Books, Other resources	
Suggested Readings:	
1. Bernard Meneses, "Network Security and Cryptography", CEGAGE Learning. ISBN-10:81-315-1349-1. ISBN-13: 978-81-315-1349-1, 2014. 2. Charles P. Feegler, "Security in Computing", Prentice Hall, 4th Edition, ISBN-10:0132390779, ISBN-13:978-0132390774, 2006. "Olysess Black", "Internet Security Protocols: Protecting IP Traffic", Prentice Hall PTR, 1st edition, ISBN-10:0130142492, ISBN-13:978-0130142498, 2000. 4. William Stallings, "Cryptography and Network Security", Pearson Education, 6th Edition, ISBN10: 0133354695, 2013. 5. Jonathan Rosenberg, "Cyber Law: The Law of the Internet", Springer-Verlag, 1997. 6. Mark Forgy, "Fransesco Parisi, 'The Law and Economics of CyberSecurity', Cambridge University Press, 2006. Suggested digital platforms/weblinks 1. http://onlincourses.swayam2.ac.in/nou19cs08/greview 2. http://onlincourses.swayam2.ac.in/cec20cs15/greview 3. http://ngtel.ac.in/courses/106106129 4. http://ngtel.ac.in/courses/106105031 5. http://ngtel.ac.in/courses/106106199 Suggested equivalent online courses: 1. https://www.stinglilearn.com/cyber-security/certification2 2. https://study.torontosom.ca/cybersecurity/diploma 3. https://aws.amazon.com/security/courses/byawsxgerts 4. https://www.udacity.com/course/cvber-security-1/ Part D-Assessment and Evaluation Suggested Continuous Evaluation Methods: Maximum Marks: 100 Continuous Comprehensive Evaluation (CCE): 40 Marks University Exam (UE): 60 Marks Internal Assessment: Continuous Comprehensive Evaluation (CCE) Class Test/Assignment/Presentation External Assessment: University Exam/Section Time : 03.00 Hours Section (A): Very Short Questions Section (B): Short Questions Section (C): Long Questions 40 60 Answers/Summissions:	