

# Sandip University

Neelam Vidya Vihar, Vill.: Sijoul. P.O. : Mailam, Dist.:Madhubani, Bihar -847235

Website : <http://www.sandipuniversity.edu.in>

Toll-Free No.- 1800-313-2714 Ph: 7549991044.

School: Computer Science & Application	Programme: BCA (Bachelor of Computer Application)
Year: Third Year	Semester -V
Course: Python Programming	Course Code: BCA501
Theory: 3 Hours/Week	Max. University Theory Examination: 60 Marks
	Continuous Internal Assessment: 40 Marks
Max. Time for Theory Exam.: 2:30 Hrs	Credit: 4

## Objectives :

1	To understand the fundamentals of python programming.
2	To implement the syntax of strings and collection list using python.
3	To be able to create dictionaries, functions and modules using python programming
4	To be able to normalize a database using various normal forms.
5	To understand and apply syntax and semantics of SQL.

Unit Number	Details	Hours
1	<b>Introduction to Python Programming:</b> Features/characteristic of Python, Basic syntax, Writing and executing simple program, Basic Data Types, Declaring variables, Performing assignments, arithmetic operations, Simple input-output, Precedence of operators, Type conversion, Conditional Statements: if, if-else, nested if -else Looping: for, while, nested loops, Terminating loops, skipping specific conditions	11
2	<b>String, collection lists and Tuples:</b> Declaring strings, String Manipulation using string functions, Introduction to Collection list, Manipulating Collections Lists. <b>Tuples</b> -Introduction to Tuples, Manipulating Tuples.	9
3	<b>Dictionaries , Functions and Modules:</b> Concepts of dictionary, Techniques to create updates & delete dictionary items. <b>Functions:</b> Defining a function, Calling a function, Advantages of functions, Types of functions, Function parameters, Formal parameters,	8

	Actual parameters, Anonymous functions, Global and Local variables. <b>Modules:</b> Importing module, Creating & exploring modules, Math module, Random module, Time module.	
4	<b>Python File Input-Output, Exception Handling and Regular Expression:</b> Opening and closing file, Various types of file modes, Reading and writing to files, Manipulating directories. <b>Exception Handling</b> – What is exception, Various keywords to handle exception such try, catch, except, else, finally, raise <b>Regular Expressions</b> – Concept of regular expression, various types of regular expressions, using match function.	8
5	<b>GUI Programming in Python (using Tkinter/wxPython/Qt) :</b> What is GUI, Advantages of GUI, Introduction to GUI library, Layout management, Events and bindings, Font, Colors, drawing on Canvas (line, oval, rectangle, etc.), Widget such as :Frame, Label Button, Check button, Entry, List box, Message, Radio button, Text, Spin box etc.	9
Total (Hrs)		45

Course Outcome	
Student Should able to :	
CO1	Students will be able to <b>understand</b> the fundamental concepts of python programming.
CO2	Students will be able to <b>perform</b> string manipulation operations using python.
CO3	Students will <b>design</b> dictionaries and modules using python.
CO4	Students will be able to <b>write and read</b> from files, and handle exceptions.
CO5	Students will be able <b>implement</b> GUI forms using syntax of python programming.

Resources	
Recommended Books	<ol style="list-style-type: none"> <li>1. Introduction to Computer Science using Python- Charles Dierbach.</li> <li>2. Beginning Python: Using Python 2.6 and Python 3- James Payne</li> <li>3. Practical Programming: An Introduction to Computer Science Using Python 3- Paul Gries, Jennifer Campbell, Jason Montojo</li> <li>4. Programming Languages – Principles and Paradigms- Adesh Pandey</li> <li>5. MySQL for Python: Database Access Made Easy- A. Lukaszewski</li> </ol>
Reference Books	<ol style="list-style-type: none"> <li>1. T. Budd, Exploring Python, TMH, 1st Ed, 2011</li> <li>2. Allen Downey, Jeffrey Elkner, Chris Meyers , How to think like a computer scientist: learning with Python , Freely available online.2012</li> </ol>

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School: Computer Science & Application	Programme: BCA (Bachelor of Computer Application)
Year: Third Year	Semester –V
Course: Data Mining	Course Code:BCA502
Theory : 3 Hrs/Week	Max. University Theory Examination: 60 Marks
Tutorial : 1Hr/Week	Continuous Internal Assessment: 40 Marks
Max. Time for Theory Exam.: 2:30 Hrs	Credit: 4

## Objectives :

1	Identify the scope and necessity of Data Mining.
2	To understand Data Mining architecture and KDD.
3	To understand various Data Mining Rules.
4	To develop ability to design various algorithms based on data mining tools.

Unit Number	Details	Hours
1	<b>Data Mining:</b> Data mining tasks-Data mining vs KDD, Issues in data mining, Data Mining metrics, Data mining architecture , Data cleaning, Data transformation, Data reduction ,Data mining primitives.	10
2	<b>Data mining knowledge representation</b> :Task relevant data ,Background knowledge ,Interestingness measures ,Representing input data and output knowledge, Visualization techniques, Experiments with Weka - visualization	11
3	<b>Data Mining Techniques:-</b> An Overview: Introduction, Data Mining, Data Mining Versus Database Management System, Data Mining Techniques- Association rules, Classification, Regression, Clustering, Neural networks.	12
4	<b>Association Rule Mining:</b> Introduction, Mining single dimensional Boolean association rules from transactional databases , Mining multi-dimensional association rules. <b>Classification and Prediction:</b> Classification Techniques, Issues regarding classification and prediction, decision tree , Bayesian classification ,Classifier accuracy , Clustering , Clustering Methods - Outlier analysis.	13

5	<b>Applications of Data mining:</b> Introduction, Business Applications Using Data Mining- Risk management and targeted marketing, Customer profiles and feature construction, Medical applications (diabetic screening), Scientific Applications using Data Mining, Other Applications.	11
Total (Hrs)		57

Course Outcome	
Student Should able to :	
CO1	Understand the basic concepts of Date Mining.
CO2	Understand how to mine the relevant data and to house that data.
CO3	To be able to learn about architecture, association and classification of data mining.

Resources	
Recommended Books	<ol style="list-style-type: none"> <li>1. Jiawei Han and Micheline Kamber, " Data Mining Concepts and Techniques", Morgan Kaufmann Publishers, USA, 2006.</li> <li>2. Berson,"DataWarehousing, Data Mining and OLAP", Tata McGraw Hill Ltd, New Delhi, 2004.</li> <li>3. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, , Pearson Education.</li> <li>4.Arun K Pujari,"Data mining techniques", Oxford University Press, London, 2003.</li> </ol>
Reference Books	<ol style="list-style-type: none"> <li>1.Dunham M H,"Data mining: Introductory and Advanced Topics". Pearson Education, New Delhi, 2003.</li> <li>2. Mehmed Kantardzic," Data Mining Concepts, Methods and Algorithms", John Wiley and Sons, USA, 2003.</li> <li>3.Soman K. P., DiwakarShyam, Ajay V., Insight into Data mining: Theory and Practice, PHI 2006.</li> <li>4.Data Mining and Business Analytics with R, Johannes Ledolter, Wiley, 2013, ISBN: 978-1118447147 (online access via Pitt network) (primary book, hereafter referred as "DMR")</li> <li>5.Web Data Mining: Exploring Hyperlinks, Contents, and Usage Data (2nd ed.), Bing Liu, Springer, 2011, ISBN: 978-3642194597 (available online) (secondary book, hereafter referred as "WDM")</li> <li>6.Practical Data Science with R, Nina Zumel and John Mount, Manning Publications 2014, ISBN: 9781617291562 (online access via Pitt network) (third book, hereafter referred as "DSR")</li> </ol>

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School: Computer Science & Application	Programme: BCA (Bachelor of Computer Application)
Year: Third Year	Semester -V
Course: (Elective I) Information Security	Course Code: BCA503II
Theory : 3 Hrs/Week	Max. University Theory Examination: 60 Marks
	Continuous Internal Assessment: 40 Marks
Max. Time for Theory Exam.: 2:30 Hrs	Credit: 4

## Objectives :

1	Develop an understanding of information assurance as practiced in computer operating systems, distributed systems, networks and representative applications.
2	Gain familiarity with prevalent network and distributed system attacks, defenses against them, and forensics to investigate the aftermath.
3	Develop a basic understanding of cryptography, how it has evolved, and some key encryption techniques used today.
4	Develop an understanding of OS and Wireless Network security policies.

Unit Number	Details	Hours
1	<b>Information Security Concepts:</b> Information Security Overview, Background and Current Scenario, Types of Attacks, Goals for Security, E-commerce Security, Computer Forensics, Steganography, <b>Security Threats and Vulnerabilities:</b> Overview of Security threats, Weak / Strong Passwords and Password Cracking, Insecure Network connections, Malicious Code, Programming Bugs.	13
2	<b>Security Management Practices:</b> Overview of Security Management, Information Classification Process, Security Policy, Risk Management, Security Procedures and Guidelines, Business Continuity and Disaster Recovery, Ethics and Best Practices. <b>Security Laws and Standards:</b> Security Assurance, Security Laws, IPR	12
3	<b>Access Control and Intrusion Detection:</b> Overview of Identification and Authorization, Overview of IDS, Intrusion Detection Systems and Intrusion Prevention Systems. <b>Server Management and Firewalls:</b> User Management, Overview of Firewalls, Types of Firewalls, DMZ and firewall features.	13

	<b>Security for VPN and Next Generation Technologies:</b> VPN Security, Security in Multimedia Networks, Various Computing Platforms: HPC, Cluster and Computing Grids, Virtualization and Cloud Technology and Security	
4	<b>Security Architectures and Models:</b> Designing Secure Operating Systems, Controls to enforce security services, Information Security Models, <b>System Security:</b> Desktop Security, email security: PGP and SMIME 3. Web Security: web authentication, SSL and SET , Database Security	10
5	<b>OS Security:</b> OS Security Vulnerabilities updates and patches, OS integrity checks, Anti-virus software, Configuring the OS for security, OS Security Vulnerabilities, updates and patches. <b>Wireless Networks and Security:</b> Components of wireless networks, Security issues in wireless	12
Total (Hrs)		45

### Course Outcome

Student Should able to :

CO1	Understand and Apply Information Security Concept.
CO2	Understand the concept of security management practice and Security Law Standards.
CO3	Understand the security architecture and models.
CO4	Understand the security about OS and Wireless Network.

### Resources

Recommended Books	<ol style="list-style-type: none"> <li>1. Mark Stamp, "Principles of Information Security", Wiley Publications</li> <li>2. Stallings William, Cryptography and Network Security: Principles and Practice, 6th Edition, Pearson/Prentice- Hall, 2013.</li> </ol>
Reference Books	<ol style="list-style-type: none"> <li>1. Bishop Matt, Introduction to Computer Security, Addison-Wesley, 2004.</li> <li>2. Pieprzyk Josef, Hardjono Thomas and Seberry Jennifer, Fundamentals of Computer Security, Springer, 2003.</li> </ol>
E-Resources	<a href="http://nptel.ac.in/">http://nptel.ac.in/</a>

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School: Computer Science & Application	Programme: BCA (Bachelor of Computer Application)
Year: Third Year	Semester -V
Course: (Elective I) Cloud Computing	Course Code: BCA503II
Theory : 3 Hrs/Week	Max. University Theory Examination: 60 Marks
	Continuous Internal Assessment: 40 Marks
Max. Time for Theory Exam.: 2:30 Hrs	Credit: 4

**Objectives :**

1	Introduce the cloud computing in a very basic way.
2	To learn about cloud computing and its advantage in the industry.
3	To learn about cloud computing architecture and the virtualization.
4	To learn about cloud platform in industry and its utilization.

Unit Number	Details	Hours
1	Introduction ,Cloud Computing at a Glance, The Vision of Cloud Computing, Defining a Cloud, A Closer Look, Cloud Computing Reference Model, Characteristics and Benefits, Challenges Ahead, Historical Developments, Distributed Systems, Virtualization, Web 2.0, Service-Oriented Computing, Utility-Oriented Computing, Building Cloud Computing Environments, Application Development, Infrastructure and System Development, Computing Platforms and Technologies, Amazon Web Services (AWS), Google AppEngine, Microsoft Azure, Hadoop, Force.com and Salesforce.com, Manjrasoft Aneka Virtualization, Introduction, Characteristics of Virtualized, Environments Taxonomy of Virtualization Techniques, Execution Virtualization, Other Types of Virtualization, Virtualization and Cloud Computing, Pros and Cons of Virtualization, Technology	13

2	<p>Cloud Computing Architecture, Introduction, Cloud Reference Model, Architecture, Infrastructure / Hardware as a Service, Platform as a Service, Software as a Service, Types of Clouds, Public Clouds, Private Clouds, Hybrid Clouds, Community Clouds, Economics of the Cloud, Open Challenges, Cloud Definition, Cloud Interoperability and Standards Scalability and Fault Tolerance Security, Trust, and Privacy Organizational Aspects Aneka: Cloud Application Platform, Framework Overview, Anatomy of the Aneka Container, From the Ground Up: Platform Abstraction Layer, Fabric Services, foundation Services, Application Services, Building Aneka Clouds, Infrastructure Organization, Logical Organization, Private Cloud Deployment Mode, Public Cloud Deployment Mode, Hybrid Cloud Deployment Mode, Cloud Programming and Management, Aneka SDK, Management Tools</p>	12
3	<p>Concurrent Computing: Thread Programming, Introducing Parallelism for Single Machine Computation, Programming Applications with Threads, What is a Thread? Thread APIs, Techniques for Parallel Computation with Threads, Multithreading with Aneka, Introducing the Thread Programming Model, Aneka Thread vs. Common Threads, Programming Applications with Aneka Threads, Aneka Threads Application Model, Domain Decomposition: Matrix Multiplication, Functional Decomposition: Sine, Cosine, and Tangent. High-Throughput Computing: Task Programming, Task Computing, Characterizing a Task, Computing Categories, Frameworks for Task Computing, Task-based Application Models, Embarrassingly Parallel Applications, Parameter Sweep Applications, MPI Applications, Workflow Applications with Task Dependencies, Aneka Task-Based Programming, Task Programming Model, Developing Applications with the Task Model, Developing Parameter Sweep Application, Managing Workflows.</p>	13
4	<p>Data Intensive Computing: Map-Reduce Programming, What is Data-Intensive Computing?, Characterizing Data-Intensive Computations, Challenges Ahead, Historical Perspective, Technologies for Data-Intensive Computing, Storage Systems, Programming Platforms, Aneka MapReduce Programming, Introducing the MapReduce Programming Model, Example Application</p>	10
5	<p>Cloud Platforms in Industry, Amazon Web Services, Compute Services, Storage Services, Communication Services, Additional Services, Google AppEngine, Architecture and Core Concepts, Application Life-Cycle, Cost Model, Observations, Microsoft Azure, Azure Core Concepts, SQL Azure, Windows Azure Platform Appliance. Cloud Applications Scientific Applications, Healthcare: ECG Analysis in the Cloud, , Social Networking, Media Applications, Multiplayer Online Gaming</p>	12
Total (Hrs)		45



Course Outcome	
Student Should able to :	
CO1	Explain the concepts and terminologies of cloud computing.
CO2	Demonstrate cloud frameworks and technologies.
CO3	Define data intensive computing.
CO4	Demonstrate cloud applications.

Resources	
Recommended Books	Rajkumar Buyya, Christian Vecchiola, and Thamarai Selvi Mastering Cloud. Computing McGraw Hill Education
Reference Books	Cloud Computing Black Book , by Kailash Jayaswal jaganath, kallakurchi, Donald J. Houde.
E-Resources	<a href="http://nptel.ac.in/">http://nptel.ac.in/</a>

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School: Computer Science & Application	Programme: BCA (Bachelor of Computer Application)
Year: Third Year	Semester -V
Course: (Elective I) Artificial Intelligence	Course Code: BCA503II
Theory : 3 Hrs/Week	Max. University Theory Examination: 60 Marks
	Continuous Internal Assessment: 40 Marks
Max. Time for Theory Exam.: 2:30 Hrs	Credit: 4

## Objectives :

1	Basic knowledge representation, problem solving, and learning methods of Artificial Intelligence
2	Develop intelligent systems by assembling solutions to concrete computational problems
3	Develop an interest in the field sufficient to take more advanced subjects

Unit Number	Details	Hours
1	What is artificial intelligence?, Problems, Problem Spaces and search, Heuristics search technique	8
2	Knowledge Representation Issues, Using Predicate Logic, Representing Knowledge using Rules.	8
3	Symbolic Reasoning under Uncertainty, Statistical reasoning, Weak Slot and Filter Structures.	8
4	Strong slot-and-filler structures, Game Playing.	8
5	Natural Language Processing, Learning, Expert Systems.	8
Total (Hrs)		40

Course Outcome	
Student Should able to :	
CO1	Identify the AI based problems
CO2	Apply techniques to solve the AI problems
CO3	Define learning and explain various learning techniques
CO4	Discuss expert systems.

Resources	
Recommended Books	1. E. Rich , K. Knight & S. B. Nair - Artificial Intelligence, 3/e, McGraw Hill.
Reference Books	1. Artificial Intelligence: A Modern Approach, Stuart Russell, Peter Norving, Pearson Education 2nd Edition. 2. Dan W. Patterson, Introduction to Artificial Intelligence and Expert Systems – Prentice Hal of India.
E-Resources	<a href="http://nptel.ac.in/">http://nptel.ac.in/</a>

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School: Computer Science & Application	Programme: BCA (Bachelor of Computer Application)
Year: Third Year	Semester -V
Course: Graphics & Multimedia	Course Code: BCA504
Theory : 3 Hrs/Week	Max. University Theory Examination: 60 Marks
Tutorial : 1Hr/Week	Continuous Internal Assessment: 40 Marks
Max. Time for Theory Exam.: 2:30 Hrs	Credit: 4

## Objectives :

1	To identify a range of concepts, techniques and tools for creating and editing the interactive multimedia applications.
2	To identify both theoretical and practical aspects in designing multimedia system using hardware and software technologies
3	To understand how to use text-related element in multimedia design correctly
4	To describe the use of text related elements in multimedia design.
5	To understand various Digital Audio , Video standard formats and technologies.

Unit Number	Details	Hours
1	<b>Introduction to computer graphics &amp; graphics systems:</b> Overview of computer graphics, representing pictures, preparing, presenting & interacting with pictures for presentations; Visualization & image processing; RGB color model, direct coding, lookup table;	12
2	<b>Multimedia:</b> Introduction to multimedia, Components, Uses of multimedia, Advantage of Digital Multimedia, Multimedia system Architecture, Objects of Multimedia.	13
3	<b>Making Multimedia:</b> Stages of a multimedia project, Requirements to make good multimedia, Multimedia Hardware - Macintosh and Windows production Platforms, Hardware peripherals - Connections, Memory and storage devices, Multimedia software and Authoring tools.	11
4	<b>Text:</b> Fonts & Faces, Using Text in Multimedia, Font Editing & Design Tools, Hypermedia & Hypertext. <b>Images:</b> Still Images – Bitmaps, Vector Drawing, 3D Drawing & rendering,	12

	Natural Light & Colors, Computerized Colors, Color Palletes, Image File Formats.	
5	<b>Sound:</b> Digital Audio, MIDI Audio, MIDI vs Digital Audio, Audio File Formats. <b>Video:</b> How Video Works, Analog Video, Digital Video, Video File Formats, Video Shooting and Editing. <b>Animation:</b> Principle of Animations. Animation Techniques, Animation File Formats.	12
Total (Hrs)		60

### Course Outcome

Student Should able to :

CO1	Understand the basics of multimedia.
CO2	Develop an understanding and awareness of how issues such as content, information architecture, motion, sound, design, and technology merge to form effective and compelling interactive experiences for a wide range of audiences and end users.
CO3	Be able to make multimedia project and multimedia software and authoring tools.
CO4	Understand the text in multimedia, font editing and hypermedia.
CO5	To understand the image and sound feature of multimedia.

### Resources

Recommended Books	1. Tay Vaughan, "Multimedia: Making it work", TMH, Eighth edition. 2006 2. Ralf Steinmetz and Klara Naharstedt, "Multimedia: Computing, Communications Applications", Pearson, 1995.
Reference Books	1. Keyes, "Multimedia Handbook", TMH. 2000. 2. K. Andleigh and K. Thakkar, "Multimedia System Design", PHI, 2000
E-Resources	<a href="http://nptel.ac.in/">http://nptel.ac.in/</a>

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<b>School: Computer Science &amp; Application</b>	<b>Programme: BCA (Bachelor of Computer Application)</b>
Year: Third Year	Semester -V
Course: Web Technology	Course Code: BCA505
Practical : 3 Hrs/Week	Max. University Theory Examination: 50 Marks
Max. Time for Theory Exam.: 3 Hrs	Credit:4
	Continuous Internal Assessment: 50 Marks

Objectives:	
1	Illustrate the Semantic Structure of HTML and CSS
2	Compose forms and tables using HTML and CSS
3	Design Client-Side programs using JavaScript and Server-Side programs using PHP
4	Infer Object Oriented Programming capabilities of PHP
5	Examine JavaScript frameworks such as jQuery and Backbone

SR NO.	Description	Hours
1	Introduction to HTML, What is HTML and Where did it come from?, HTML Syntax, Semantic Markup, Structure of HTML Documents, Quick Tour of HTML Elements, HTML5 Semantic Structure Elements, Introduction to CSS, What is CSS, CSS Syntax, Location of Styles, Selectors, The Cascade: How Styles Interact, The Box Model, CSS Text Styling.	10
2	HTML Tables and Forms, Introducing Tables, Styling Tables, Introducing Forms, Form Control Elements, Table and Form Accessibility, Microformats, Advanced CSS: Layout, Normal Flow, Positioning Elements, Floating Elements, Constructing Multicolumn Layouts, Approaches to CSS Layout, Responsive Design, CSS Frameworks.	10
3	JavaScript: Client-Side Scripting, What is JavaScript and What can it do?, JavaScript Design Principles, Where does JavaScript Go?, Syntax, JavaScript Objects, The Document Object Model (DOM), JavaScript Events, Forms, Introduction to Server-Side Development with PHP, What is Server-Side Development, A Web Server's Responsibilities, Quick Tour of PHP, Program	10

	Control, Functions	
4	PHP Arrays and Superglobals, Arrays, \$_GET and \$_POST Superglobal Arrays, \$_SERVER Array, \$_FILES Array, Reading/Writing Files, PHP Classes and Objects, Object-Oriented Overview, Classes and Objects in PHP, Object Oriented Design, Error Handling and Validation, What are Errors and Exceptions?, PHP Error Reporting, PHP Error and Exception Handling	10
5	Managing State, The Problem of State in Web Applications, Passing Information via Query Strings, Passing Information via the URL Path, Cookies, Serialization, Session State, HTML5 Web Storage, Caching, Advanced JavaScript and jQuery, JavaScript Pseudo-Classes, jQuery Foundations, AJAX, Asynchronous File Transmission, Animation, Backbone MVC Frameworks, XML Processing and Web Services, XML Processing, JSON, Overview of Web Services.	10
Total Hrs		: 50

### Course Outcome

Student Should able to :

CO1	Adapt HTML and CSS syntax and semantics to build web pages.
CO2	Construct and visually format tables and forms using HTML and CSS
CO3	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically
CO4	Appraise the principles of object oriented development using PHP
CO5	Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features.

### Resources

Recommended Books	Randy Connolly, Ricardo Hoar, "Fundamentals of Web Development", 1 stEdition, Pearson Education India
Reference Books	1. Robin Nixon, "Learning PHP, MySQL & JavaScript with jQuery, CSS and HTML5", 4 thEdition, O'Reilly Publications, 2015. (ISBN:978-9352130153) 2. Luke Welling, Laura Thomson, "PHP and MySQL Web Development", 5th Edition, Pearson Education, 2016. (ISBN:978-9332582736) 3. Nicholas C Zakas, "Professional JavaScript for Web Developers", 3rd Edition, Wrox/Wiley India, 2012. (ISBN:978-8126535088) 4. David Sawyer Mcfarland, "JavaScript & jQuery: The Missing Manual", 1st Edition, O'Reilly/Shroff Publishers & Distributors Pvt Ltd, 2014 (ISBN:978-9351108078)
E-Resources	<a href="http://nptel.ac.in/">http://nptel.ac.in/</a>

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School: Computer Science & Application	Programme: BCA (Bachelor of Computer Application)
Year: Third Year	Semester -V
Course: Web Technology Lab	Course Code: BCA 52L
Practical : 3 Hrs/Week	Max. University Practical Examination: 25 Marks
	Lab Continuous Internal Assessment: 25 Marks
Max. Time for Exam.: 3 Hrs	Credit: 1

## Practical Objectives :

1	To understand the differences between microcontrollers and microprocessors.
2	To understand concepts and techniques required in embedded software for microprocessors and micro controllers and measurement of various analog parameters.

Unit No.	Description
1	Addition of two 16 bit number using 8051.
2	Multiplication of two numbers using MUL command.
3	Find the smallest number among a given set of numbers.
4	Find the largest number among a given set of numbers.
5	Arrange 'n' numbers in ascending order.
6	Arrange 'n' numbers in descending order
7	Interface a ADC and a temperature sensor to measure temperature.
8	Interface a DAC & Generate a stair case wave form –with step duration and no. of steps as variables.
9	Flash a LED connected at a specified output port terminal.
10	Interface a stepper motor and rotate it clock wise or anti clock wise through given angle steps.

## Term Work

Term Work assessment shall be conducted for the Project, Tutorials and Seminar. Term work is continuous assessment based on work done, submission of work in the form of report/journal, timely completion, attendance, and understanding. It should be assessed by subject teacher of the institute. At the end of the semester, the final grade for a Term Work shall be assigned based on the performance of the student and is to be submitted to the University.



Notes	
1	Each student should perform all experiments however at least 3 should be based on 8085, at least 3 based on 8051 and at least 3 based on PIC microcontroller.
2	The experiments from the regular practical syllabus will be performed.
3	The regular attendance of students during the syllabus practical course will be monitored and marks will be given accordingly.
4	Good Laboratory Practices.

#### Practical/Oral/Presentation:

Practical/Oral/Presentation shall be conducted and assessed jointly by internal and external examiners. The performance in the Practical/Oral/Presentation examination shall be assessed by at least a pair of examiners appointed as examiners by the University. The examiners will prepare the mark/grade sheet in the format as specified by the University.

Notes	
1	One experiment from the regular practical syllabus will be conducted. (Total 15 Marks).
2	Complete laboratory journal (05 Marks).
3	Viva-voce (05 Marks).

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School: Computer Science & Application	Programme: BCA (Bachelor of Computer Application)
Year: Third Year	Semester -V
Course: Python Programming Lab	Course Code: BCA 51L
Practical : 3 Hrs/Week	Max. University Practical Examination: 25 Marks
	Lab Continuous Internal Assessment: 25 Marks
Max. Time for Exam.: 3 Hrs	Credit: 1

**Practical Objectives :**

1	To understand the differences between microcontrollers and microprocessors.
2	To understand concepts and techniques required in embedded software for microprocessors and micro controllers and measurement of various analog parameters.

Sr. No.	Description			
	<b>Group A: Python Programming (Any SIX Assignments)</b>			
1	Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.			
2	WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria : Grade A: Percentage >=80 Grade B: Percentage >=70 and <80 Grade C: Percentage >=60 and <70 Grade D: Percentage >=40 and <60 Grade E: Percentage <40			
3	WAP to display the first n terms of Fibonacci series.			
4	WAP to find factorial of the given number.			
5	WAP to find sum of the following series for n terms: $1 - 2/2! + 3/3! - \dots - n/n!$			
6	WAP to calculate the sum and product of two compatible matrices.			
7	Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.			
	<b>Group B: (Any Three Assignments)</b>			

8	Write a menu-driven program to create mathematical 3D objects I. curve II. sphere III. cone IV. arrow V. ring VI. Cylinder.
9	WAP to read n integers and display them as a histogram.
10	WAP to plot a graph of people with pulse rate p vs. height h. The values of p and h are to be entered by the user.
	Group C: (Any One Assignment)
11	Create a form to design a student information system, using various tools like buttons, check boxes, radio buttons, and text boxes.
12	Create a shopping cart application based on various GUI controls.

#### Term Work:

Term Work assessment shall be conducted for the Project, Tutorials and Seminar. Term work is continuous assessment based on work done, submission of work in the form of report/journal, timely completion, attendance, and understanding. It should be assessed by subject teacher of the institute. At the end of the semester, the final grade for a Term Work shall be assigned based on the performance of the student and is to be submitted to the University.

#### Notes

1	The experiments from the regular practical syllabus will be performed (15 Marks).
2	The regular attendance of students during the syllabus practical course will be monitored and marks will be given accordingly (5 Marks).
3	Good Laboratory Practices (5 Marks)

#### Practical/Oral/Presentation:

Practical/Oral/Presentation shall be conducted and assessed jointly by internal and external examiners. The performance in the Practical/Oral/Presentation examination shall be assessed by at least a pair of examiners appointed as examiners by the University. The examiners will prepare the mark/grade sheet in the format as specified by the University.

#### Notes

1	One experiment from the regular practical syllabus will be conducted. (Total 15 Marks).
2	Complete laboratory journal (05 Marks).
3	Viva-voce (05 Marks).