

Bachelor of Vocation (Software Development)
2023-24 Session
Fifth Semester

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits
			L	T	P	External	Internal		
BVSD-501	General Educational	Software Engineering	4	1	0	60	40	100	5
BVSD-502	Skill	Programming in Java	4	1	0	60	40	100	5
BVSD-503	General Educational	General Elective - III	4	1	0	60	40	100	5
BVSD-504	General Educational	General Elective - IV			5	60	40	100	5
BVSD-505	Skill	General Elective - V	0	0	5	50	--	50	5
BVSD-506	Skill	Software Lab – VIII(based on paper BVSD-502)	0	0	5	50	--	50	5
		Total				340	160	500	30

Elective III: Choose any one of the following papers:

1.	BVSD-503 GE1	Artificial Intelligence
2.	BVSD-503 GE2	System Software
3.	BVSD-503 GE3	Cloud Computing

Elective IV: Choose any one of the following papers:

1.	BVSD-504 SEC1	Network Security
2.	BVSD-504 SEC2	System Administration and Maintenance.
3.	BVSD-504 SEC3	Fundamental of Electronics and Computer Hardware.

Elective V: Choose any one of the following papers:

1.	BVSD-505 DSE1	Workshop on Python Programming.
2.	BVSD-505 DSE2	Workshop on 'R' Programming.
3.	BVSD-505 DSE3	Workshop on SCILAB

The Breakup of marks for practical will be as under

- Lab record 15 Marks
- Program Development and Execution 20 Marks
- Viva Voce 15 Marks

The Breakup of marks for the internal assessment will be as under:

- MST/Internal Examinations 20 Marks
- Attendance 08 Marks
- Assignment/Co-curricular etc 08 Marks
- Conduct of Student 04 Marks

Mr.Mukesh Kumar

Dr. Raman Maini

Dr.Sarabjeet Singh

Dr.Rajan Manro

Mr. Sandeep Sharma

Mr. Parduman Singh

Ms. Rashmi Arora

Dr. Navdeep Singh

Dr. Harjeet Singh

Mr. Devinder Singh

Ms. HarsimratDeo

Ms. RituWalia

Ms. Devinder Kaur

Ms. Taranpreet Kaur

Dr. Sangeeta Joshi

Mr. Birinder Singh Sarao

Ms. Manpreet Kaur

Mr.Joga Singh

Bachelor of Vocation (Software Development)
2023-24 Session
Sixth Semester

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits
			L	T	P	External	Internal		
BVSD-601	General Educational	General Elective - VI	4	1	0	60	40	100	5
BVSD-602	Skill	General Elective - VII	4	1	0	60	40	100	5
BVSD-603	General Educational	General Elective - VIII	4	1	0	--	100	100	5
BVSD-604	Skill	Software Lab – IX (Based on paper -BVSD- 601)			5	50	-	50	5
BVSD-605	Skill	Software Lab – X (based on paper BVSD-602)	0	0	5	50	--	50	5
BVSD-606	Skill	Project	0	0	5	50	50	100	5
		Total				270	230	500	30

Elective VI: Any one of the following papers:

1.	BVSD-601 E1	Computer Graphics
2.	BVSD-601 E2	Image Processing

Elective VII: Any one of the following papers:

1.	BVSD-602 E1	Web Development using ASP.NET
2.	BVSD-602 E2	Web Development using PHP
3.	BVSD-602 E3	Web Development using Node.js

Elective VIII: Any one of the following papers:

1.	BVSD-603 E1	Quantitative and Logical Aptitude
2.	BVSD-603 E2	Personality Development with Presentation & Communication Skills.

The Breakup of marks for practical will be as under

- Lab record 15 Marks
- Program Development and Execution 20 Marks
- Viva Voce 15 Marks

The Breakup of marks for the internal assessment will be as under:

- MST/Internal Examinations 20 Marks
- Attendance 08 Marks
- Assignment/Co-curricular etc 08 Marks
- Conduct of Student 04 marks

Mr.Mukesh Kumar Dr. Raman Maini Dr.Sarabjeet Singh Dr.Rajan Manro

Mr. Sandeep Sharma Mr. Parduman Singh Ms. Rashmi Arora Dr. Navdeep Singh

Dr. Harjeet Singh Mr. Devinder Singh Ms. HarsimratDeo Ms. RituWalia

Ms. Devinder Kaur Ms. Taranpreet Kaur Dr. Sangeeta Joshi Mr. Birinder Singh Sarao

Ms. Manpreet Kaur Mr.Joga Singh

Fifth Semester

BVSD-501 Software Engineering

Max Marks: 100

External Examination: 60

Pass Marks: 35%

Maximum Time: 3 Hrs.

Internal Assessment: 40 Min

Lectures to be delivered: 45-55 Hrs.

Objectives of the Subject:

- i. Knowledge of basic Software engineering methods and practices and their appropriate application.
- ii. Describe software engineering layered technology and Process frame work.
- iii. A general understanding of software process models such as the waterfall and evolutionary models.

Course Learning Outcomes

- i. An ability to identify, formulate, and solve complex problems.
- ii. Introduces the concept of coding and testing a software.
- iii. Familiarize the maintenance of the software.
- iv.

Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry 9 marks. Section C will have 8 short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the CANDIDATES: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

Unit I

Introduction: The Problem Domain, Software Engg. Challenges, Software Engg. Approach. Software development life cycle, its phases, Software development process models :Waterfall, Prototyping, Iterative;

Software Process: Characteristics of software process, Project management process, Software configuration management process. Project Planning – activities, COCOMO model.

Software Metrics: Definition, Importance, Categories of metrics. Software Quality – Attributes, Cyclomatic complexity metric.

Software Requirements Analysis: Need for SRS, Data flow diagrams, Data Dictionary, entity relationship diagram, Characteristics and components of SRS, validation, metrics

Unit II

Software Design: Design principles, Module-level concepts, Structure Chart and Structured Design methodology, verification, metrics : network metrics, information flow metrics.

Coding : Programming Principles and Guidelines, Verification- code inspections, static analysis.

Software Testing: testing fundamentals, Black Box Testing : Equivalence class partitioning, Boundary value analysis, cause-effect graphing; White Box Testing : Control flow and Data flow based testing, mutation testing; levels of testing, test plan, test case specification, test case execution and analysis,

Software maintenance: Categories of maintenance. Software Reliability – Definition, uses of reliability studies.

Text Books:

- 1..An Integrated approach to Software Engineering, Third Edition ,Pankaj Jalote, Narosa Publications.
2. Software Engineering , Revised Second Edition , K.K. Aggarwal, Yogesh Singh, New Age International Publishers.

Reference Book:

Software Engineering – A Practitioner’s Approach, Fifth Edition, Roger. S. Pressman, McGraw Hill

Teaching Plan:

Week	Content
1-2	Introduction: The Problem Domain, Software Engg. Challenges, Software Engg. Approach. Software development life cycle, its phases, Software development process models :Waterfall, Prototyping, Iterative.
3-4	Software Process: Characteristics of software process, Project management process, Software configuration management process. Project Planning – activities, COCOMO model.
5-6	Software Metrics – Definition, Importance, Categories of metrics. Software Quality – Attributes, Cyclomatic complexity metric.
7-8	Software Requirements Analysis – Need for SRS, Data flow diagrams, Data Dictionary, entity relationship diagram, Characteristics and components of SRS, validation, metrics
9-10	Software Design: Design principles, Module-level concepts, Structure Chart and Structured Design methodology, verification, metrics : network metrics, information flow metrics
11-12	Coding : Programming Principles and Guidelines, Verification- code inspections, static analysis.
13-14	Control flow and Data flow based testing , mutation testing; levels of testing, test plan, test case specification, test case execution and analysis, Software maintenance: Categories of maintenance. Software Reliability – Definition, uses of reliability studies.

BVSD-502
Programming in JAVA

Max Marks: 100
External Examination: 60
Min Pass Marks: 35%

Maximum Time: 3 Hrs.
Internal Assessment: 40
Lectures to be delivered: 45-55 Hrs.

Objectives of the Subject:

- i. Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
- ii. Understand fundamentals of object-oriented programming in Java.
- iii. Define classes, invoking methods, using class libraries etc

Course Learning Outcomes:

- i. Students will be able to implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.
- ii. Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to particular problem.
- iii. Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.

Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry 9 marks. Section C will have 8 short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the Candidates: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

UNIT –I

Introduction to Java: evolution, features, comparison with C and C++; Java program structure; tokens, keywords, constants, variables, data types, type casting, statements.

Operators and expressions: arithmetic, relational, logical, assignment, increment, decrement, conditional, bitwise and special operators. Operator precedence & associativity rules.

Control statements: if else, switch case, for, while, do while, break, continue, labeled loops.

Class: syntax, instance variable, class variables, methods, constructors, overloading of constructors and methods.

UNIT –II

Inheritance: types of inheritance, use of super, method overriding, final class, abstract class, wrapper classes. Arrays, Strings and Vectors, Packages and Interfaces, visibility controls.

Errors and Exceptions: Types of errors, Exception classes, Exception handling in java, use of try, catch, finally, throw and throws. Taking user input, Command line arguments.

Multithreaded Programming: Creating Threads, Life cycle of thread, Thread priority, Thread synchronization, Inter-thread communication.

Applets: Introduction, Applet Class, Applet Life Cycle, Graphics in Applet, Event-Handling.

File and I/O Streams: File Class, Streams, Byte Streams, Filtered Byte Streams, Random Access File Class, Character Streams

Text Book:

1. Patrick Naughton and Herbert Schildt, “The Complete Reference Java 2”, TMH

Reference Books:

1. Horstmann, Cay S. and Gary Cornell, “Core Java
2. Fundamentals Vol. 1”, Pearson Education.
3. E. Balagurusamy “Programming with Java”, TMH

Teaching Plan:

Week	Content
1-2	Introduction to Java: evolution, features, comparison with C and C++; Java program structure; tokens, keywords, constants, variables, data types, type casting, statements. Operators and expressions: arithmetic, relational, logical, assignment, increment, decrement, conditional, bitwise and special operators. Operator precedence & associativity rules.
3-4	Control statements: if else, switch case, for, while, do while, break, continue, labeled loops. Class: syntax, instance variable, class variables, methods, constructors, overloading of constructors and methods.
5-6	Inheritance: types of inheritance, use of super, method overriding, final class, abstract class, wrapper classes. Arrays, Strings and Vectors, Packages and Interfaces, visibility controls
7-8	Errors and Exceptions: Types of errors, Exception classes, Exception handling in java, use of try, catch, finally, throw and throws.
9-10	Multithreaded Programming: Creating Threads, Life cycle of thread, Thread priority, Thread synchronization, Inter-thread communication.
11-12	Applets: Introduction, Applet Class, Applet Life Cycle, Graphics in Applet, Event-Handling.
13-14	File and I/O Streams: File Class, Streams, Byte Streams, Filtered Byte Streams, Random Access File Class, Character Streams

BVSD-503 GE1
Artificial Intelligence

Max Marks: 100

External Examination: 60

Pass Marks: 35%

Maximum Time: 3 Hrs.

Internal Assessment: 40 Min

Lectures to be delivered: 45-55 Hrs.

Objectives of the Subject:

- i. To impart basic proficiency in representing difficult real life problems in a state space representation so as to solve them using AI techniques like searching and game playing.
- ii. To create an understanding of the basic issues of knowledge representation and Logic as well as an understanding of other topics that plays an important role in AI programs.

Course Learning outcomes:

- i. To apply the basic principles, models, and algorithms of AI
- ii. To recognize, model, and solve problems in the analysis and design of information systems
- iii. To analyze the structures and algorithms of a selection of techniques related to searching, reasoning, machine learning, and language processing.

Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry 9 marks. Section C will have 8 short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the Candidates: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

Unit I

Introduction to Artificial Intelligence: Concept and definition, importance of AI, History of AI, Turing Test, AI related fields.

Problem solving using AI: Introduction: Defining problem as state space, analyzing problem, Finding the solution, Representation of AI problem, Nature of AI Problems, Example of AI Problems: Tic-Tac-Toe, Water-Jug problem. Techniques: Breadth-first, Depth-first.

Heuristic Search: Introduction, basic concept of heuristic search, concept of heuristic knowledge, types of heuristic search techniques.

Unit-II

Introduction to knowledge: Introduction, Types of Knowledge, Knowledge representation, Knowledge Storage, knowledge acquisition.

Logic: Introduction, propositional calculus, predicate Logic, resolution, unification, limitation of logic and resolution.

Knowledge Representation Techniques: Introduction, Frames, Semantic Network, Conceptual Dependencies, Script, CYC. Introduction to Expert System and Natural Language Processing.

Text Books:

1. Introduction to Artificial Intelligence and Expert Systems by Dan W. Patterson, Published by Pearson Education, Inc
2. Artificial Intelligence By Ela Kumar, Published by IK International Publishing House PVT LTD

Reference Books:

1. Introduction to artificial Intelligence by E. Charnaik and D. McDermott, Addison-Wesley Publishing Company.
2. Principles of Artificial Intelligence by Nils J. Nilson, Narosa Publishing Co.
3. Expert Systems for Personal Computers by M. Chandwick and J.A. Hannah, Galgotia Publications Pvt. Ltd.

Teaching Plan:

Week	Content
1-2	Introduction to Artificial Intelligence: Concept and definition, importance of AI, History of AI, Turing Test, AI related fields.
3-4	Problem solving using AI: Introduction: Defining problem as state space, analyzing problem, Finding the solution, Representation of AI problem, Nature of AI Problems.
5-6	Example of AI Problems: Tic-Tac-Toe, Water-Jug problem. Techniques: Breadth-first, Depth-first Heuristic Search: Introduction, basic concept of heuristic search, concept of heuristic knowledge, types of heuristic search techniques.
7-8	Heuristic Search: Introduction, basic concept of heuristic search, concept of heuristic knowledge, types of heuristic search techniques. Introduction to knowledge: Introduction, Types of Knowledge, Knowledge representation, Knowledge Storage, knowledge acquisition.
9-10	Logic: Introduction, propositional calculus, predicate Logic, resolution, unification, and resolution
11-12	Knowledge Representation Techniques: Introduction, Frames, Semantic Network, Conceptual Dependencies, Script, CYC
13-14	Introduction to Expert System and Natural Language Processing.

BVSD-503 GE2
System Software

Max Marks: 100
External Examination: 60
Min Pass Marks: 35%

Maximum Time: 3 Hrs.
Internal Assessment: 40
Lectures to be delivered: 45-55 Hrs.

Objectives of the Subject:

- i. To learn context free grammars, compiler parsing techniques.
- ii. To understand the theory and practice of compiler implementation.
- iii. This course provides knowledge to design various system programs.

Course Learning Outcomes:

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

- i. Understand fundamentals of the compiler and identify the relationships among different phases of the compiler.
- ii. Understand fundamentals of assembler and linker and loader.

Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry **9** marks. Section C will have 8 short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the Candidates: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

Unit I

Introduction: Definition of system software, types of system software, features of system programming, system programming vs. application programming.

Language Processors: Introduction, Language processing activates, Fundamentals of Language Processing.

Assembler: Elements of Assembly Language Processing, A simple Assembly scheme, Pass structure of Assemblers, Design of a two pass assembler. A brief overview of single pass assembly and problem of forward references.

Linkers and Loaders: Definition of linker and loader Design of Absolute Loader, Re-locatable Loader.

Unit II

Compilers: Overview of Compilation Process, Scanning, Parsing (Top down and Bottom Up parsing), Intermediate code forms (variant I and II) intermediate code form for arithmetic expressions (postfix, prefix, triples, quadruples – concepts only), Code optimization transformations (Compile time evaluation, Elimination of common sub-expression, Dead code elimination, Frequency reduction, strength reduction – concepts only), compiler vs. interpreter.

Software Tools: Software tools for program development, Editors, Debug monitors, Programming environments, User Interfaces.

Text Books:

1. Dhamdhare D. M. "Systems Programming and Operating system", Tata McGraw-Hill Publishing Company Limited, New Delhi, Second Edition.
2. Donovan, "System programming". (McGraw-Hill), 1991.

Reference Book:

1. Aho and Ulman, "Principles of Compilers", Narosa Publishing House.

Week	Content
1-2	Introduction: Definition of system software, types of system software, features of system programming, system programming vs. application programming.
3-4	Language Processors: Introduction, Language processing activates, Fundamentals of Language Processing. Assembler: Elements of Assembly Language Processing
5-6	A simple Assembly scheme, Pass structure of Assemblers, Design of a two pass assembler. A brief overview of single pass assembly and problem of forward references
7-8	Linkers and Loaders: Definition of linker and loader Design of Absolute Loader, Relocatable Loader. Compilers: Overview of Compilation Process, Scanning.
9-10	Parsing (Top down and Bottom Up parsing), Intermediate code forms (variant I and II) intermediate code form for arithmetic expressions (postfix, prefix, triples, quadruples – concepts only),
11-12	Code optimization transformations (Compile time evaluation, Elimination of common sub-expression, Dead code elimination, Frequency reduction, strength reduction – concepts only), compiler vs. interpreter.
13-14	Software Tools: Software tools for program development, Editors, Debug monitors, Programming environments, User Interfaces.

BVSD-503 GE3
Cloud Computing

Max Marks: 100
External Examination: 60
Min Pass Marks: 35%

Maximum Time: 3 Hrs.
Internal Assessment: 40
Lectures to be delivered: 45-55 Hrs

Objectives of the Subject:

- i. To understand the basics of Cloud Computing.
- ii. To understand the movement from a traditional network infrastructure to a Cloud solution.

Course Learning Outcomes: On completion of this course, the student will be able to:

- i. Understand the core concepts of the cloud computing paradigm
- ii. Understanding importance of virtualization along with their technologies
- iii. Analyze various cloud computing service and deployment models and apply them to solve problems on the cloud.
- iv. Implementation of various security strategies for different cloud platform

Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry **9** marks. Section C will have **8** short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the Candidates: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

UNIT-I

Introduction : Definition of cloud, characteristics of cloud, historical developments & challenges ahead, the vision of cloud computing, Driving factors towards cloud, Comparing grid with utility computing, cloud computing and other computing systems, types of workload patterns for the cloud, IT as a service, Applications of cloud computing.

Cloud computing concepts: Introduction to virtualization techniques, Characteristics of virtualization, Pros and Cons of virtualization Technology, Hypervisors, Types of hypervisors, Multitenancy, Application programming interfaces (API), Elasticity and scalability.

UNIT-II

Cloud service models: Cloud service models, Infrastructure as a service (IaaS) architecture- details and example, Platform as a service (PaaS) architecture- details and example, Software as a service (SaaS) architecture-- details and example, Comparison of cloud service delivery models.

Cloud deployment models: Introduction to cloud deployment models, Public clouds, Private clouds, Hybrid clouds, Community clouds, Migration paths for cloud, Selection criteria for cloud deployment.

Security in cloud computing: Understanding security risks, Principal security dangers to cloud computing, Internal security breaches, User account and service hijacking, measures to reduce cloud security breaches Case Studies: Comparison of existing Cloud platforms /Web Services

Text Books:

1. Michael Miller, Cloud Computing, 2008.
2. Judith Hurwitz, Robin Bllor, Marcia Kaufman, Fern Halper, Cloud Computing for dummies, 2009.
3. Sosinsky Barrie, "Cloud Computing: Bible", Wiley Publication, 2011.

Reference Book:

Raj Kumar Buyya, James Broberg, Andrezei M.Goscinski, Cloud Computing: Principles and paradigms, 2011.

Teaching Plan:

Week	Content
1-2	Introduction :Definition of cloud, characteristics of cloud, historical developments &challenges ahead, the vision of cloud computing, Driving factors towards cloud
3-4	Comparing grid with utility computing, cloud computing and other computing systems, types of workload patterns for the cloud, IT as a service, Applications of cloud computing.
5-6	Cloud computing concepts: Introduction to virtualization techniques, Characteristics of virtualization, Pros and Cons of virtualization Technology, Hypervisors, Types of hypervisors, Multitenancy, Application programming interfaces (API), Elasticity and scalability.
7-8	Cloud service models: Cloud service models, Infrastructure as a service (IaaS) architecture- details and example, Platform as a service (PaaS) architecture- details and example Software as a service (SaaS) architecture-- details and example, Comparison of cloud service delivery models
9-10	Cloud deployment models: Introduction to cloud deployment models, Public clouds, Private clouds, Hybrid clouds ,Community clouds, Migration paths for cloud, Selection criteria for cloud deployment.
11-12	Security in cloud computing: Understanding security risks, Principal security dangers to cloud computing, Internal security breaches, User account and service hijacking, measures to reduce cloud security breaches
13-14	Case Studies: Comparison of existing Cloud platforms /Web Services

BVSD-504 SEC1 Network Security

Max Marks: 100
External Examination: 60
Min Pass Marks: 35%

Maximum Time: 3 Hrs.
Internal Assessment: 40
Lectures to be delivered: 45-55 Hrs.

Course objectives: To learn network security in technical aspects.

Course Outcomes:

At the end of the course the students will be able to

- i. Prevent, detect and react threat incidents and attacks.
- ii. Apply the network and information security concepts.

Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry **9** marks. Section C will have **8** short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the Candidates: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

UNIT-I

Introduction to network security, Malware and its types: virus, worms, rootkits, bots, Trojan, backdoor, Ransomwares. DDoSattack, man-in-middle attack, DNS poisoning.

Vulnerabilities: Port Scanning, Fingerprinting, Packet Sniffing, Services, Code

Cryptography Concepts: Concepts of Data encryption, Introduction, Plaintext & Cipher text, Substitution Techniques, Transposition Techniques, Encryption & Decryption, Symmetric & Asymmetric key Cryptography. Public Key Infrastructure (PKI), Different attacks on Cryptosystems.

UNIT-II

Network Security and Infrastructure, Authentication Basics, Password, Authentication Token, Certificate based Authentication

Firewalls: Firewall Basics, Types of Firewalls, Network Address Translation Issues.

Security Procedures: Malware Analysis. Open Source/ Free/ Trial Tools: Antivirus Protection, Anti Spywares, System tuning tools, Anti Phishing., Email Header Analysis.

Textbook:

Network Security Essentials, Prentice-Hall by William Stallings, ISBN: 0-13-016093-8

Reference Books

James S. Tiller, “The Ethical Hack: A Framework for Business Value Penetration Testing”, Auerbach Publications, CRC Press

Teaching Plan:

Week	Content
1-2	Introduction to network security , Malware and its types: virus, worms, rootkits, bots, Trojan, backdoor, Ransomwares. DDoSattack, man-in-middle attack, DNS poisoning.
3-4	Vulnerabilities: Port Scanning, Fingerprinting, Packet Sniffing, Services, Code, Symmetric &Asymmetric key Cryptography
5-6	Public Key Infrastructure (PKI), Different attacks on Cryptosystems. Cryptography Concepts: Concepts of Data encryption, Introduction, Plaintext &Cipher text,
7-8	Substitution Techniques, Transposition Techniques, Encryption &Decryption Network Security and Infrastructure , Authentication Basics, Password,
9-10	Authentication Token, Certificate based Authentication Firewalls: Firewall Basics, Types of Firewalls
11-12	Network Address Translation Issues. Security Procedures: Malware Analysis.
13-14	Open Source/ Free/ Trial Tools: Antivirus Protection, Anti Spywares, System tuning tools, Anti Phishing., Email Header Analysis.

BVSD-504 SEC2 System Administration and Maintenance.

MaxMarks:100

ExternalExamination:60

Min PassMarks: 35%

MaximumTime:3Hrs.

InternalAssessment: 40

Lectures to be delivered: 45-55Hrs.

Objective of the Course:

The course is designed to provide complete knowledge of Windows Server OS

Course Learning Outcomes:

1. Demonstrate an understanding of the principles, practices and goals of system administration.
2. Students will use creativity to solve problems.
3. Attain skills and concepts that are essential to the administration of operating systems
4. The students will gain knowledge about System Administration or Windows Administration.

Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry **9** marks. Section C will have **8** short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the Candidates: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

UNIT-I

Understanding Windows Programming Basics: Identify Windows application types, Implement user interface design.

Creating Windows Forms Applications: Create and handle events, Understand Windows Forms inheritance, understand how to create new controls and extend existing controls, Validate and implement user input, Debug a Windows-based application.

Creating Windows Services Applications: Create a Windows Services application, Install a Windows Services application.

Accessing Data in a Windows Forms Application: Understand data access methods for a Windows Application, Understand databound controls.

Deploying a Windows Application: Understand windows application deployment methods, integrating data.

UNIT-II

Network basics: Type of Networks, Topologies, Transmission media, Install UTP (Straight, Cross, Rollover Cables), IP Addressing, Subnetting, OSI Model, TCP/IP Model, Wireless Network, Network Devices.

Installation : Installation Server 2008, Drivers, Working with windows 2008 Devices, Troubleshooting Devices & Drivers, Managing system updates.

Working With Disk Storage: Type of Disk Storage, Type of volumes, Implementing fault tolerance, Use disk management tools, Disk Quota, Troubleshooting disk management, Shadow copy.

Domain Controller: Install Active Directory, Manage Active Directory Component, Working with

OU Structure, Working with Domain User account, Working with Domain Groups, Troubleshooting Active Directory.

Domain Name Services (DNS): Define Name resolution, Install DNS, Configure DNSClient, Manage and Troubleshoot DNS.

Dynamic Host Configuration Protocol: Configure DNS Server, Working With SuperScope, Configure DHCP Client, Manage and Troubleshoot DHCP Server.

Backup and Restore: Requirement for Backup and Recovery AD, Issue for AD Backup and Recovery, Steps for Backup and Recovery AD.

Text Books:

1. Mastering Window Server 2008 “Mark Minasi, John Paul Mueller”
2. Microsoft Windows Server 2008 “The Complete Reference” Danielle Ruest,

Reference Books:

1. MTA Windows of Fundamentals (Microsoft Official Academic Course) [Paperback] Microsoft Official Academic Course.
2. Windows 7 Configuration : Microsoft Certified Technology Specialist Exam 70-680 [With Access Code] (Microsoft Official Academic Course) [Paperback] Craig Zacker (Author)
3. Window Server Administration fundamentals : Microsoft Official Academic Course

Teaching Plan:

Week	Content
1-2	Understanding Windows Programming Basics: Identify Windows application types, Implement user interface design. Creating Windows Forms Applications: Create and handle events, Understand WindowsForms inheritance, understand how to create new controls and extend existing controls
3-4	Validate and implement user input, Debug a Windows-based application. Creating Windows Services Applications: Create a Windows Services application, Install a Windows Services application.
5-6	Accessing Data in a Windows Forms Application: Understand data access methods for a Windows Application, Understand databound control Deploying a Windows Application: Understand windows application deployment methods, integrating data
7-8	Network basics: Type of Networks, Topologies, Transmission media, Install UTP(Straight, Cross, Rollover Cables), IP Addressing, Subnetting, OSI Model, TCP/IP Model, Wireless Network, Network Devices. Installation : Installation Server 2008, Drivers, Working with windows 2008 Devices, Troubleshooting Devices & Drivers, Managing system updates
9-10	Working With Disk Storage: Type of Disk Storage, Type of volumes, Implementing fault tolerance, Use disk management tools, Disk Quota, Troubleshooting disk management, Shadow copy. Domain Controller: Install Active Directory, Manage Active Directory Component, Working with OU Structure, Working with Domain User account, Working with Domain Groups, Troubleshooting Active Directory.
11-12	Domain Name Services (DNS): Define Name resolution, Install DNS, Configure DNSClient, Manage and Troubleshoot DNS. Dynamic Host Configuration Protocol: Configure DNS Server, Working With SuperScope
13-14	Configure DHCP Client, Manage and Troubleshoot DHCP Server. Backup and Restore: Requirement for Backup and Recovery AD, Issue for AD Backup and Recovery, Steps for Backup and Recovery AD.

BVSD-504 SEC3 Fundamental of Electronics and Computer Hardware.

Max Marks: 100
External Examination: 60
Min Pass Marks: 35%

Maximum Time: 3 Hrs.
Internal Assessment: 40
Lectures to be delivered: 45-55 Hrs.

Course Objective:

This course provides an overview of introductory concepts about computers, number systems and components of computer system. It builds the foundation of the computer application course.

Course Learning Outcomes:

On successful completion of this course, a student will be able to:

1. Handle a computer system for day to day use.
2. Establish the self-employed Society.
3. Generate the Basic Knowledge of Computer Hardware.

Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry **9** marks. Section C will have **8** short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the Candidates: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

Unit-I

Number System and Codes: Decimal, Binary, Hexadecimal and Octal number systems, base conversions, Binary Coded Decimal code and ASCII Codes.

Logic Gates: Truth Tables of OR, AND, NOT, XOR, XNOR, Universal (NOR and NAND) Gates

Combinational logic analysis and design: Standard representation of logic functions (SOP and POS), Minimization Techniques (k Map technique) up to 4 variable, Multiplexers and Demultiplexers, Adder and Subtractor (half and full)

Sequential logic design: Latch, Flip flop, S-R FF, J-K FF, T and D type FFs, Counters (Up/Down counter)

Unit-II

Introduction of Computer: Definition of Computers, Block diagram of computer, classification of computer, Characteristics of computers, Types of Software & languages, Language translators

Computer Hardware: Introduction to hardware components of computer, Identifying the important hardware components of PC (CPU, Motherboard, RAM, HDD, ODD, Mouse, SMPS, Monitor), Functions of Hardware components.

Introduction to Operating System : Types of Operating System, Process of Booting the operating system, Assembling a Computer , Installation of Software (Windows)

Text Book:

V.K.Puri, Digital Electronics, McGraw Hill Education

Reference Books:

1. M. Morris Mano Digital System Design, Pearson Education Asia,(Fourth Edition)
2. Thomas L. Flyod, Digital Fundamentals, Pearson Education Asia (1994)
3. Craig Zacker, John Rourke ,PC Hardware:The Complete Reference ,Tata Mcgraw Hill

Teaching Plan:

Week	Content
1-2	Number System and Codes: Decimal, Binary, Hexadecimal and Octal number systems, base conversions, Binary Coded Decimal code and ASCII Codes.
3-4	Logic Gates: Truth Tables of OR, AND, NOT, XOR, XNOR, Universal (NOR and NAND) Gates
5-6	Combinational logic analysis and design: Standard representation of logic functions (SOP and POS), Minimization Techniques (k Map technique) up to 4 variable ,Multiplexers and Demultiplexers, Adder and Subtractor (half and full)
7-8	Sequential logic design: Latch, Flip flop, S-R FF , J-K FF, T and D type FFs, Counters (Up/Down counter)
9-10	Introduction of Computer: Definition of Computers, Block diagram of computer, classification of computer, Characteristics of computers, Types of Software & languages, Language translators
11-12	Computer Hardware: Introduction to hardware components of computer, Identifying the important hardware components of PC (CPU, Motherboard, RAM, HDD, ODD, Mouse, SMPS, Monitor), Functions of Hardware components.
13-14	Introduction to Operating System : Types of Operating System, Process of Booting the operating system, Assembling a Computer , Installation of Software (Windows)

BVSD-505 DSE1 Workshop on Python Programming.

Maximum Marks: 50

External Examination: 50

Minimum Pass Marks: 35%

Lectures to be delivered: 45-55 hrs

Objectives of the Subject:

- i. To understand why Python is a useful scripting language for developers.
- ii. To learn how to design and program Python applications.
- iii. To learn how to use lists, tuples, and dictionaries in Python programs.
- iv. To learn how to identify Python object types.

Course Outcomes:

Students will be able to :

- i. Explain environment, data types, operators used in Python.
- ii. Compare Python with other programming languages.

Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry **9** marks. Section C will have **8** short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the Candidates: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

Unit-I

Introduction to Python Programming Language: Programming Language, History and Origin of Python

Language, Features of Python, Limitations, Major Applications of Python, Getting, Installing Python, Setting up Path and Environment Variables, Running Python, First Python Program, Python Interactive Help Feature, Python differences from other languages. Python Data Types & Input/Output: Keywords, Identifiers, Python Statement, Indentation, Documentation, Variables, Multiple Assignment, Understanding Data Type, Data Type Conversion, Python Input and Output Functions, Import command. Operators and Expressions: Operators in Python, Expressions, Precedence, Associativity of Operators, Non Associative Operators. Control Structures: Decision making statements, Python loops, Python control statements. Python Native Data Types: Numbers, Lists, Tuples, Sets, Dictionary, Functions & Methods of Dictionary, Strings (in detail with their methods and operations).

Unit-II

Python Functions: Functions, Advantages of Functions, Built-in Functions, User defined functions, Anonymous functions, Pass by value Vs. Pass by Reference, Recursion, Scope and Lifetime of Variables. Python Modules: Module definition, Need of modules, Creating a module, Importing module, Path Searching of a Module, Module Reloading, Standard Modules, Python Packages. Exception Handling: Exceptions, Built-in exceptions, Exception handling, User defined exceptions in Python. File Management in Python: Operations on files (opening, modes, attributes, encoding,

closing), read() & write() methods, tell() & seek() methods, renaming & deleting files in Python, directories in Python. Classes and Objects: The concept of OOPS in Python, Designing classes, Creating objects, Accessing attributes, Editing class attributes, Built-in class attributes, Garbage collection, Destroying objects.

References:

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. How to think like a computer scientist : learning with Python / Allen Downey, Jeffrey Elkner, Chris Meyers. 1st Edition

Teaching Plan:

Week	Content
1-2	Introduction to Python Programming Language: Programming Language, History and Origin of Python Language, Features of Python, Limitations, Major Applications of Python, Getting, Installing Python, Setting up Path and Environment Variables, Running Python, First Python Program, Python Interactive Help Feature, Python differences from other languages. Python Data Types & Input/Output: Keywords, Identifiers, Python Statement, Indentation, Documentation, Variables, Multiple Assignment, Understanding Data Type, Data Type Conversion, Python Input and Output Functions, Import command. Operators and Expressions: Operators in Python, Expressions, Precedence, Associativity of Operators, Non Associative Operators.
3-4	Control Structures: Decision making statements, Python loops, Python control statements. Python Native Data Types: Numbers, Lists, Tuples, Sets, Dictionary, Functions & Methods of Dictionary, Strings (in detail with their methods and operations).
5-6	Python Functions: Functions, Advantages of Functions, Built-in Functions, User defined functions, Anonymous functions, Pass by value Vs. Pass by Reference, Recursion, Scope and Lifetime of Variables.
7-8	Python Modules: Module definition, Need of modules, Creating a module, Importing module, Path Searching of a Module, Module Reloading, Standard Modules, Python Packages.
9-10	Exception Handling: Exceptions, Built-in exceptions, Exception handling, User defined exceptions in Python.
11-12	File Management in Python: Operations on files (opening, modes, attributes, encoding, closing), read() & write() methods, tell() & seek() methods, renaming & deleting files in Python, directories in Python.
13-14	Classes and Objects: The concept of OOPS in Python, Designing classes, Creating objects, Accessing attributes, Editing class attributes, Built-in class attributes, Garbage collection, Destroying objects.

BVSD-505 DSE2 Workshop on ‘R’ Programming.

Maximum Marks: 50

External Examination: 50

Minimum Pass Marks: 35%

Lectures to be delivered: 45-55 hrs

Objectives of the Subject: The students will be able to implement statistical data analysis using R Package

Course Outcome: After Completion of the course the students will be able to:

- Identify the key components of R programming Language.
- Define the concept of data Science.
- Differentiate between vectors and arrays.

Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry 9 marks. Section C will have 8 short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the Candidates: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

Unit-I

R Programming Fundamentals: Introduction to R, Installing R, Windows/Linux/Mac Installation, Setting up Path, Using Packages, and Running R: Interactive Mode, Batch Mode, Getting Help, Startup and Shut Down.

Vectors: Scalars, Vectors, Arrays and Matrices, Declarations, Recycling, Common Vector Operations, Using all() and any(), Na and Null Values, Filtering, ifelse() Function. Matrices and Arrays: Creating Matrices, General Matrix Operations, Applying Functions to Matrix Rows and Columns, Adding & Deleting Matrix Rows and Columns, Difference Between Matrix and Vector. Lists: Creating Lists, General List Operations, Accessing List Components and Values, Applying Functions to Lists, Recursive Lists. Data Frames: Creating Data Frames, Merging Data Frames, Applying Functions to Data Frames. Factors and Tables: Introduction, Common Functions use with Factors, Working with Tables. R Programming Structures: Control Statements, Arithmetic and Boolean Operators, Default Values for Arguments, Return Values, Recursion.

Unit-III

Object Oriented Programming: Concept of Classes, S3 Classes, S4 Classes, S3 Versus S4 Classes, Managing Objects. Input/Output: Accessing Keyboard and Monitor, Reading and Writing Files, Accessing the Internet. String Manipulation: Overview of String Manipulation Functions [grep(), nchar(), paste(), sprintf(), substr(), strsplit(), regexpr(), gregexpr()], Regular expression. Graphics: Creating Graphs, Customizing Graphs, Saving Graphs to Files, Creating 3D Plots. Debugging: Principles of Debugging, Use of Debugging Tool, Using R Programming Debugging Facilities.

Simulation: Generating Random Numbers, Setting the Random Number Seed, Simulating a Linear Model, Random Sampling.

Reference Book:

1. W. N. Venables, D. M. Smith, An Introduction to R, R-core team,2015
2. William N. Venables and David M. Smith, An Introduction to R. 2nd Edition. Network Theory Limited.2009
3. Norman Matloff, The Art of R Programming - A Tour of Statistical Software Design, No Starch Press.2011

Teaching Plan:

Week	Content
1-2	R Programming Fundamentals: Introduction to R, Installing R, Windows/Linux/Mac Installation, Setting up Path, Using Packages, and Running R: Interactive Mode, Batch Mode, Getting Help, Startup and Shut Down.
3-4	Vectors: Scalars, Vectors, Arrays and Matrices, Declarations, Recycling, Common Vector Operations, Using all() and any(), Na and Null Values, Filtering, ifelse()
5-6	Function. Matrices and Arrays: Creating Matrices, General Matrix Operations, Applying Functions to Matrix Rows and Columns, Adding &Deleting Matrix Rows and Columns, Difference Between Matrix and Vector.
7-8	Lists: Creating Lists, General List Operations, Accessing List Components and Values, Applying Functions to Lists, Recursive Lists.
9-10	Data Frames: Creating Data Frames, Merging Data Frames, Applying Functions to Data Frames. Factors and Tables: Introduction, Common Functions use with Factors, Working with Tables.R Programming Structures: Control Statements, Arithmetic and Boolean Operators, Default Values for Arguments, Return Values, Recursion.
11-12	Object Oriented Programming: Concept of Classes, S3 Classes, S4 Classes, S3 Versus S4 Classes, Managing Objects. Input/Output: Accessing Keyboard and Monitor, Reading and Writing Files, Accessing the Internet..
13-14	String Manipulation: Overview of String Manipulation Functions [grep(), nchar(), paste(), sprintf(), substr(), strsplit(), regexpr(), gregexpr()], Regular expression. Graphics: Creating Graphs, Customizing Graphs, Saving Graphs to Files, Creating 3D Plots. Debugging: Principles of Debugging, Use of Debugging Tool, Using R Programming Debugging Facilities. Simulation: Generating Random Numbers, Setting the Random Number Seed, Simulating a Linear Model, Random Sampling

BVSD-505 DSE3 Workshop on SCILAB

Maximum Marks: 50

External Examination: 50

Minimum Pass Marks: 35%

Lectures to be delivered:

Course Objective: The aim of this course is obtain the necessary knowledge to solve numerical problems through Scilab capacities.

Course Learning Outcomes:

- i. To create understanding of the Scilab.
- ii. To understand the fundamentals of Scilab and Utilization.
- iii. To understand graphical representation of mathematical functions

Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry **9** marks. Section C will have **8** short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the Candidates: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

Unit – I

Introduction to Scilab – what is scilab, downloading & installing scilab, a quick taste of scilab.
The Scilab Environment – manipulating the command line, working directory, comments, variables in memory, recording sessions, the scilab menu bar, demos.
Scalars & Vectors – introduction, initializing vectors in scilab, mathematical operations on vectors, relational operations on vectors, logical operations on vectors, built-in logical functions.

Unit – II

Scalars & Vectors – elementary mathematical functions, mathematical functions on scalars, complex numbers, trigonometric functions, inverse trigonometric functions, hyperbolic functions.
Matrices – introduction, arithmetic operators for matrices, basic matrix processing.
Polynomials – introduction, creating polynomials, basic polynomial commands, finding roots of polynomial, polynomial arithmetic, miscellaneous polynomial handling.

Text Book:

Er. Hema Ramachandran, Dr. Achuthsankar S. Nair, Computer SCILAB–A Free Software to MATLAB References

References:

1. Digite, Introduction to Scilab
2. Digite, Optimization in Scilab
3. Scilab Enterprises, Scilab for Very Beginners
4. Digite, Introduction to Discrete Probabilities with Scilab
5. Spoken Tutorial on “Scilab” as E-resource for Learning:- <http://spokentutorial.org>

Teaching Plan:

Week	Content
1-2	Introduction to Scilab – what is scilab, downloading & installing scilab, a quick taste of scilab.
3-4	The Scilab Environment – manipulating the command line, working directory, comments, variables in memory, recording sessions, the scilab menu bar, demos.
5-6	Scalars & Vectors – introduction, initializing vectors in scilab, mathematical operations on vectors, relational operations on vectors, logical operations on vectors, built-in logical functions.
7-8	Unit – II Scalars & Vectors – elementary mathematical functions, mathematical functions on scalars, complex numbers, trigonometric functions
9-10	Inverse trigonometric functions, hyperbolic functions. Matrices – introduction, arithmetic operators for matrices, basic matrix processing.
11-12	Polynomials – introduction, creating polynomials, basic polynomial commands, finding roots of polynomial
13-14	Polynomial arithmetic, miscellaneous polynomial handling

BVSD-506
Software Lab – VIII (based on paper BVSD-502)

Maximum Marks: 50
External Examination: 50

Minimum Pass Marks: 35%
Lectures to be delivered: 45-55 hrs

Objectives of the Subject:

The objective of the course is to build software development skills using Java programming for real world applications.

Course Outcome:

After Completion of the course the students will be able to:

- i. This course will teach the implementation of basic concepts and techniques which form the object oriented programming paradigm.
- ii. Prepare students to be in a position to write object oriented programs using Java.
- iii. To Build an application using user Interface Components.

Implement programs in Java

This laboratory course will comprise as exercises to supplement what is learnt under paper BVSD-502.

Students are required to develop the following programs with internal documentation:

1. WAP to demonstrate the concept of class.
2. WAP that illustrates the use of constructor.
3. WAP for constructor overloading.
4. WAP for single inheritance using super keyword.
5. WAP for multilevel inheritance.
6. WAP to demonstrate method overriding.
7. WAP that implements multiple inheritance through interface.
8. WAP to demonstrate importing multiple packages.
9. WAP to demonstrate creating threads by extending Thread class.
10. WAP to demonstrate creating threads by implementing Runnable interface.
11. WAP that illustrates the use of exception handling.

Sixth Semester

BVSD-601 E1 Computer Graphics

MaxMarks:100
ExternalExamination:60
Min Pass Marks: 35%

MaximumTime:3Hrs.
Internal Assessment: 40
Lectures to be delivered: 45-55Hrs.

Course Objectives:

- i. This course will introduce students to all aspects of computer graphics including hardware, software and applications.
- ii. It will help students to apply graphics programming techniques to design, and create computer graphics.

Course Learning Outcomes

- i. Introducing the basic concepts used in computer graphics.
- ii. Enables to implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.
- iii. Familiarize the importance of viewing and projections.
- iv. Will make us understand a typical graphics pipeline .

Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry **9** marks. Section C will have **8** short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the Candidates: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

UNIT-I

Functioning of Input devices: Keyboard, Touch panel, Light pens, Graphic tablets, Joysticks, Data glove, Image scanner, Mouse.

Functioning of Output devices: Impact and non impact printers, such as line printer, dot matrix, laser, ink-jet, electrostatic, flatbed and drum plotters.

Functioning of Video Display Devices: Refresh cathode ray tube, raster scan displays, random scan displays, color CRT monitors, DVST, flat-panel displays, virtual reality, raster scan systems, Frame buffer and video controller.

Scan conversion algorithms for line, circle and ellipse, Bresenham's algorithms, area filling techniques.

UNIT-II

2-d Graphics: 2-dimensional Geometric transformations(translation, Scaling, Rotation, Reflection, Shearing), Viewing transformation.

2D clipping algorithms (Cohen Sutherland and Liang Barsky's line clipping algorithms), polygon and text clipping.

3-dimensional Graphics: Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Composite transformations

Mathematics of Projections (parallel & perspective), 3-D viewing transformations and clipping.

Text Books:

1. D. Hearn and M.P. Baker, "Computer Graphics", PHI New Delhi; Second Edition.
2. J.D. Foley, A.V. Dam, S.K. Feiner, J.F. Hughes, R.L Phillips, "Introduction to Computer Graphics", Addison-Wesley Publishing company, N.Y.; Second Edition.

Reference Book:

1. R.A. Plastock and G. Kalley, "Computer Graphics", McGraw Hill.

Teaching Plan:

Week	Content
1-2	Functioning of Input devices: Keyboard, Touch panel, Light pens, Graphic tablets, Joysticks, Data glove, Image scanner, Mouse.
3-4	Functioning of Output devices: Impact and non impact printers, such as line printer, dot matrix, laser, ink-jet, electrostatic, flatbed and drum plotters.
5-6	Functioning of Video Display Devices: Refresh cathode ray tube, raster scan displays, random scan displays, color CRT monitors, DVST, flat-panel displays, virtual reality, raster scan systems, Frame buffer and video controller.
7-8	Scan conversion algorithms for line, circle and ellipse, Bresenham's algorithms, area filling techniques.
9-10	2-d Graphics: 2-dimensional Geometric transformations(translation, Scaling, Rotation, Reflection, Shearing), Viewing transformation,
11-12	2D clipping algorithms (Cohen Sutherland and Liang Barsky's line clipping algorithms), polygon and text clipping.
13-14	3-dimensional Graphics: Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Composite transformations, Mathematics of Projections (parallel & perspective), 3-D viewing transformations and clipping.

BVSD-601 E2-Image Processing

MaxMarks:100

ExternalExamination:60

Min Pass Marks: 35%

MaximumTime:3Hrs.

Internal Assessment: 40

Lectures to be delivered: 45-55 Hrs.

Course Objectives:

To Understand various image compression techniques

Course Outcomes:

After undergoing this course, the students will be able to:

- i. Understand the basic concepts of DIP.
- ii. Improve the quality of digital images.

Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry **9** marks. Section C will have **8** short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the Candidates: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

UNIT-I

Introduction to the DIP areas and applications; Components of Digital Image Processing; Elements of Visual Perception; Image Sensing and Acquisition; Image Sampling and Quantization; Relationships between pixels; color models.

Spatial Domain: Gray level transformations; Histogram processing; Basics of Spatial Filtering; Smoothing and Sharpening Spatial Filtering Frequency Domain: Introduction to Fourier Transform; Smoothing and Sharpening frequency domain filters; Ideal, Butterworth and Gaussian filters

UNIT-II

Noise models; Mean Filters; Order Statistics; Adaptive filters; Band reject Filters; Band pass Filters; Notch Filters; Optimum Notch Filtering; Inverse Filtering; Wiener filtering

Feature Extraction: Contour and shape dependent feature extraction, Extraction of textural features Segmentation: Detection of Discontinuities; Edge Linking and Boundary detection; Region based segmentation; Morphological processing- erosion and dilation.

Text Books:

1. Rafael C. Gonzales, Richard E. Woods, "Digital Image Processing", Third Edition, Pearson Education.
2. Anil Jain K. "Fundamentals of Digital Image Processing", PHI Learning Pvt. Ltd.

Reference Books:

1. Willliam K Pratt, "Digital Image Processing", John Willey.
2. Nick Efford, "Digital Image Processing a practical introduction using Java", Third Edition, Pearson Education

3. R.C. Gonzalez, R.E. Woods, and S. L. Eddins “Digital Image Processing using MATLAB”, Pearson Prentice-Halls

Teaching Plan:

Week	Content
1-2	Introduction to the DIP areas and applications; Components of Digital Image Processing; Elements of Visual Perception;
3-4	Image Sampling and Quantization; Relationships between pixels; color models. Spatial Domain: Gray level transformations
5-6	Histogram processing; Basics of Spatial Filtering; Smoothing and Sharpening Spatial Filtering Frequency
7-8	Introduction to Fourier Transform; Smoothing and Sharpening frequency domain filters; Ideal, Butterworth and Gaussian filters
9-10	Noise models; Mean Filters; Order Statistics; Adaptive filters; Band reject Filters; Band pass Filters; Notch Filters; Optimum Notch Filtering; Inverse Filtering; Wiener filtering
11-12	Feature Extraction: Contour and shape dependent feature extraction, Extraction of textural features Segmentation: Detection of Discontinuities
13-14	Edge Linking and Boundary detection; Region based segmentation; Morphological processing-erosion and dilation.

BVSD 602 E1
Web Development Using ASP .Net

MaxMarks:100
ExternalExamination:60
Min PassMarks: 35%

MaximumTime:3Hrs.
InternalAssessment: 40
Lecturesto bedelivered: 45-55Hrs.

Course Objectives :

- i. This course will provide students with the tools and techniques to build dynamic Web sites using the ASP.Net programming environment.
- ii. Develop a data driven web application.
- iii. Understand the fundamentals of developing modular application by using object oriented methodologies.

Course Learning Outcomes

- i. Understand the Microsoft .NET Framework and ASP.NET page structure
- ii. Design web application with variety of controls
- iii. Access the data using inbuilt data access tools
- iv. Use Microsoft ADO.NET to access data in web Application
- v. Configure and deploy Web Application
- vi. Develop secured web application

Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry **9** marks. Section C will have **8** short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the Candidates: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

Unit I

Introduction: Introduction to Microsoft ASP.NET, .Net Framework, An overview of .NET including the Common Language Interface, Common Type System, Common Language Runtime, and .NET class libraries. Language and platform neutrality. An introduction to Web Forms, The ASP.NET execution model.

ASP.NET Web Application User Interface: Creating an ASP.NET Web application user interface with various controls, creating and using Master page, Implementing event handlers by using code-behind files, Explain user input by using validation controls.

Unit II

Managing State: The Various Means to Manage State, Request object, Application object, Cache object, Session object, Server-side state management, Using session for server-side and client-side state management.

XML Web Services: Need of XML Web services, Understanding the Web Service Model, Creating an ASP.NET Web Service. Implementing Navigation for the User Interface: Round Trip and Post back, State Management for user navigation, Navigation between Pages.

Storing and Retrieving Data with ADO.NET: ADO.NET Overview, Connecting to Data, Executing SQL with Commands, Accessing Data with ADO.NET, Fast Data Access with Data Readers, DataSet Basics, Filling DataSets with Data Adapters.

Data Binding: Bind Data to the UI, Transform and Filter Data.

Security: Authenticating and Authorizing Users, Using Windows Authentication, Using Forms Authentication. Using Caching Page: Output Caching, User Control Caching, Data Caching

Text Books:

1. Matthew MacDonald: ASP.NET: The Complete Reference, Osborne.
2. Jesse Liberty, Dan Hurwitz: Programming ASP.NET, OReilly.

Reference Books:

1. Stephen Walther: ASP.NET 3.5 Unleashed, SAMS.
2. Infosys Campus Connect Foundation Program Volume:1 – 3, Education & Research Department, Infosys Technologies Ltd , Bangalore.

Teaching Plan:

Week	Content
1-2	Introduction: Introduction to Microsoft ASP.NET, .Net Framework, An overview of .NET including the Common Language Interface, Common Type System, Common Language Runtime, and .NET class libraries. Language and platform neutrality. An introduction to Web Forms, The ASP.NET execution model.
3-4	ASP.NET Web Application User Interface: Creating an ASP.NET Web application user interface with various controls, creating and using Master page, Implementing event handlers by using code-behind files, Explain user input by using validation controls.
5-6	Managing State: The Various Means to Manage State, Request object, Application object, Cache object, Session object, Server-side state management, Using session for server-side and client-side state management.
7-8	XML Web Services: Need of XML Web services, Understanding the Web Service Model, Creating an ASP.NET Web Service. Implementing Navigation for the User Interface: Round Trip and Post back, State Management for user navigation, Navigation between Pages.
9-10	Storing and Retrieving Data with ADO.NET: ADO.NET Overview, Connecting to Data, Executing SQL with Commands, Accessing Data with ADO.NET, Fast Data Access with Data Readers, DataSet Basics, Filling DataSets with Data Adapters.
11-12	Data Binding: Bind Data to the UI, Transform and Filter Data.
13-14	Security: Authenticating and Authorizing Users, Using Windows Authentication, Using Forms Authentication. Using Caching Page: Output Caching, User Control Caching, Data Caching

BVSD 602 E2
Web Development Using PHP

MaxMarks:100

ExternalExamination:60

Min PassMarks: 35%

MaximumTime:3Hrs.

InternalAssessment: 40

Lecturesto bedelivered: 45-55Hrs.

Course Objectives:

After the completion of the course, students will get hands-on experience on various techniques of web development and will be able to design and develop a complete website.

Course Learning Outcomes

- i. Gain the PHP Programming skills needed to successfully build interactive, data driven sites.
- ii. Use THE MVC Pattern to organize code
- iii. Test and debug a PHP application

Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry **9** marks. Section C will have **8** short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the Candidates: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

UNIT-I

Introduction to PHP for Web Development & Web Applications, History& Future Scope of PHP
Installation of tools for working in PHP like XAMPP, LAMP, WAMP for PHP Apache & MySQL.

Introduction to Language constructs :Variables, constants, Data types, Comments

Outputting Data to the Browser: print(), echo(), printf(), sprintf()

Arrays: Introduction to Array, use of array, Numeric Array, Associative Array, Multi-Dimensional Array

PHP Functions: User Defining functions, Passing parameter & return value.

Built-in Functions: Math functions, String functions, Array Functions.

Date & time functions, Date formats, Include, Require.

Strings and Regular Expressions: Regular Expression Syntax (POSIX), Brackets, Quantifiers, Predefined Character Ranges

Form Handling: Creating Forms using HTML, GET/POST/REQUEST.

State Management: Using Session and Cookies.

Object-Oriented PHP: Classes, Objects, Constructor & Destructor, Access Specifier, Inheritance, Overloading.

UNIT-II

Introduction of php MyAdmin(Mysql) , types of server used for mysql.

Database queries – insert, select, update, delete, alter table, Primary Key, Foreign Key.

Select query with where, Having, Group by, Order by, like, in, not in, between, joins.

Connection – mysqli_connect, mysqli_select_db.

Queries – mysqli_query, mysqli_fetch_array , mysqli_fetch_assoc , mysqli_fetch_row , mysqli_fetch_object, mysql_insert_id()

PHP Advance: Uploading files to server, Sending Email/ Email Script.

AJAX: Introduction to AJAX, AJAX Model, Implementation of Ajax.

PHP Framework: Introduction to PHP Framework, Types of Frameworks, Difference Between CMS and MVC.

Textbooks:

1. PHP and MYSQL web development (5th Edition) by Luke Welling & Laura Thomson.
2. PHP for Beginners by Ivan Bross.

Reference Books:

1. PHP: The Complete Reference by Steven Holzner
2. PHP Pocket Reference by PHP Pocket Reference.
3. PHP- MySQL Development by Laura Thomson and Luke Welling
4. Head First PHP and MySQL by Beighley

Teaching Plan

Week	Content
1-2	Introduction to PHP for Web Development & Web Applications, History& Future Scope of PHP Installation of tools for working in PHP like XAMPP, LAMP, WAMP for PHP Apache & MySQL. Introduction to Language constructs :Variables, constants, Data types, Comments
3-4	Outputting Data to the Browser: print(), echo(), printf(), sprintf() Arrays: Introduction to Array, use of array, Numeric Array, Associative Array, Multi-Dimensional Array
5-6	PHP Functions: User Defining functions, Passing parameter & return value. Built-in Functions: Math functions, String functions, Array Functions. Date & time functions, Date formats, Include, Require.
7-8	Strings and Regular Expressions: Regular Expression Syntax (POSIX), Brackets, Quantifiers, Predefined Character Ranges Form Handling: Creating Forms using HTML, GET/POST/REQUEST.
9-10	State Management: Using Session and Cookies. Object-Oriented PHP: Classes, Objects, Constructor & Destructor, Access Specifier, Inheritance, Overloading.
11-12	Introduction of php MyAdmin(Mysqli) , types of server used for mysql. Database queries – insert, select, update, delete, alter table, Primary Key, Foreign Key. Select query with where, Having, Group by, Order by, like, in, not in, between, joins.Connection – mysqli_connect, mysqli_select_db. Queries – mysqli_query, mysqli_fetch_array , mysqli_fetch_assoc , mysqli_fetch_row , mysqli_fetch_object, mysql_insert_id()
13-14	PHP Advance: Uploading files to server, Sending Email/ Email Script. AJAX: Introduction to AJAX, AJAX Model, Implementation of Ajax.PHP Framework: Introduction to PHP Framework, Types of Frameworks, Difference Between CMS and MVC. WordPress: Introduction to wordpress, Use and Benefits of Wordpress, Installing Wordpress, WordPress Administration Dashboard & Bar.

BVSD 602 E3
Web Development using NODE.JS

Max Marks: 100

External Examination: 60

Internal Assessment: 40

Maximum Time: 3 Hrs.

Min Pass Marks: 35%

Lectures to be delivered: 45-55 Hrs

Course Objectives:

The objective of the course is to enable the students to understand and build web applications quickly and efficiently with the help of JavaScript.

Course Outcomes: On completion of this course, the student will be able to:

- Installation of Node JS.
- Creating a web server.
- Connect Node Js with database
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Instructions for External Examination: The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective Units of the syllabus and students will attempt any two questions, each question will carry **9** marks. Section C will have **8** short answer type questions which will cover the entire syllabus uniformly and will carry 3 marks.

Instructions for the Candidates: Candidates are required to attempt two questions each from unit I and II and the entire unit III.

UNIT- I

Web Development: Introduction to client/server architecture, servers, browsers, WWW, HTTP, FTP, client side and server side programming languages, web development using PHP and its frameworks, introduction to Node.js, benefits of using Node.js, traditional web server model, Node.js process model.

Node.js: Installing and setting up a Node.js environment, Installing packages globally using npm, exporting and importing modules, creating HTTP web server, handling http requests using GET and POST method. File system module: reading directories, files and streams. Debugging Node.js application using nodemon. Creating and handling JSON file formats in Node.js.

UNIT- II

Express framework: Introduction to Express framework to set up a web server, Using template engines:twig, pug, ejs, jade; developing applications using ejs, implementing API routing, middleware, and URL parameters, static files, error handling, debugging.

Working with MongoDB: Setting up a MongoDB database and connecting it to a Node.js server. Using Mongoose to model database schema and interact with MongoDB databases, creating database and collection, inserting documents into a collection, finding documents, sorting results, updating documents, deleting and dropping documents/collection.

Textbooks:

Node .Js, Shah Dhruti, Publisher: BPB Publications.

1. Beginning Node.js by Basarat Ali Syed.

References:

Web Development with Node and Express by Ethan Brown

Teaching Plan

1-2	Web Development: Introduction to client/server architecture, servers, browsers, WWW, HTTP, FTP, client side and server side programming languages
3-4	Web development using PHP and its frameworks
5-6	Installing and setting up a Node.js environment, Installing packages globally using npm, exporting and importing modules
7-8	Creating HTTP web server, handling http requests using GET and POST method, File system module: reading directories, files and streams Debugging Node.js application using nodemon. Creating and handling JSON file formats in Node.js.
9-10	Express framework: Introduction to Express framework to set up a web server, Using template engines:twig, pug, ejs, jade Developing applications using ejs, implementing API routing, middleware, and URL parameters, static files, error handling, debugging.
11-12	Working with MongoDB: Setting up a MongoDB database and connecting it to a Node.js server. Using Mongoose to model database schema and interact with MongoDB databases,
13-14	Creating database and collection, inserting documents into a collection, finding documents.Sorting results, updating documents, deleting and dropping documents/collection

BVSD-603 E1
Quantitative and Logical Aptitude

Max Marks: 100

Maximum Time: 3 Hrs

Min Pass Marks: 35%

Internal Assessment:100

Lectures to be delivered: 45-55 Hrs

OBJECTIVES

1. This course provide the students with an understanding of deductive and inductive reasoning
2. To make students understand both Verbal and Non Verbal Reasoning.
3. To practise various quantitative aptitude question.

Unit-I

Verbal Reasoning: Number series, Letter & symbol series, Logical Reasoning problems, Alphabet test,

Blood relations, Direction sense test, Input output, Coding-decoding, Number Ranking

Non-verbal Reasoning: Making series/analogy, Classification, Series test, Odd figures

Unit-II

Quantitative aptitude: whole numbers problems, Problems on Trains, Numbers and Ages, Percentage Problems, Boats and Streams, Ratio & Proportion, Square roots, Averages, Interest, Heights and Distances, Time and distance, Series, Time & Work.

Text Books:

1. R.S Aggarwal, “Quantitative aptitude”.
2. R. S Aggarwal , “Verbal and non-verbal Reasoning

Teaching Plan:

Week	Content
1-2	Verbal Reasoning: Number series, Letter & symbol series, Logical Reasoning problems
3-4	Alphabet test,Blood relations, Direction sense test
5-6	Input output, Coding-decoding, Number Ranking
7-8	Non-verbal Reasoning: Making series/analogy, Classification, Series test, Odd figures
9-10	Quantitative aptitude: whole numbers problems, Problems on Trains, Numbers and Ages, Percentage Problems
11-12	Boats and Streams, Ratio & Proportion, Square roots, Averages, Interest
13-14	Heights and Distances, Time and distance, Series, Time & Work.

BVSD-603 E2
Personality Development with Presentation & Communication Skills

Max Marks: 100

Maximum Time: 3 Hrs.

Internal Assessment: 100

Min Pass Marks: 35%

Lectures to be delivered: 45-55 Hrs.

Objective: The course is aimed at developing Leadership styles and communication skills that are necessary for successful business decisions.

Course Outcomes: On completion of this course, the student will be able to:

- i. Acquaint with different aspects of personality and role of soft skills in personality development.
- ii. Understand psychology and success, self-awareness, goals and obstacles, positive thinking, and self-motivation
- iii. Boost the confidence and present their thoughts eloquently.
- iv. Communicate effectively as a individual and team
- v. Face interviews with confidence.

UNIT-I

Introduction to Personality, Personality Development, Types of personality, Dynamics of Personality, Personality Traits, Influences on Personality, Personality Analysis through body language and Individual habits, Physical Aspects of personality, Emotional Stability, Self- awareness, Mind and mental development, Mental Blocks. Communication–Meaning, Definition, Nature and Scope of Communication, Importance of Communication. Communication Process; Principles of Communication; Types of Communication – Interpersonal Communication - Gateway to effective interpersonal Communication.

UNIT – II

Barriers to Communication- Linguistic Barriers, Psychological Barriers, Interpersonal Barriers, Cultural Barriers, Physical Barriers, Organizational Barriers. Soft Skills: Listening, Speaking, Reading and Writing Skills. Interview: meaning and types of interview, Tips for facing the interview, Group Discussion. Body Language, Presentation Skills. Personal Skills: Emotional Intelligence, Emotion Management, Tolerance of Change, Taking Criticism, Self-Confidence, Adaptability, Resilience, Assertiveness, Self Assessment.

Recommended Texts:

1. Introduction to Psychology by Atkinson and Hilgard s, Edward E. Smith , Geoffrey Loftus.
2. Personality Development by Rajiv K. Mishra , Rupa & Co.
3. Rajendra Pal Korahill, “*Essentials of Business Communication*”, Sultan Chand & Sons, New Delhi, 2006.
4. Ramesh, MS, & C. C Pattanshetti, “*Business Communication*”, R.Chand & Co, New Delhi, 2003.

Teaching Plan

Week	Content
1-2	Introduction to Personality, Personality Development, Types of personality, Dynamics of Personality, Personality Traits, Influences on Personality, Personality Analysis through body language and Individual habits,
3-4	Physical Aspects of personality, Emotional Stability, Self- awareness, Mind and mental development, Mental Blocks. Communication–Meaning, Definition, Nature and Scope of Communication, Importance of Communication. Communication Process;
5-6	Principles of Communication; Types of Communication – Interpersonal Communication - Gateway to effective interpersonal Communication.
7-8	Barriers to Communication- Linguistic Barriers, Psychological Barriers, Interpersonal Barriers, Cultural Barriers, Physical Barriers, Organizational Barriers.
9-10	Soft Skills: Listening, Speaking, Reading and Writing Skills. Interview: meaning and types of interview,
11-12	Tips for facing the interview, Group Discussion. Body Language, Presentation Skills.
13-14	Personal Skills: Emotional Intelligence, Emotion Management, Tolerance of Change, Taking Criticism, Self-Confidence, Adaptability, Resilience, Assertiveness, Self Assessment.

BVSD 604
Software Lab – IX Based on BVSD 601 E1Computer Graphics)

MaxMarks:50
External Examination:50

Min Pass Marks: 35%
Lectures to be delivered: 45-55Hrs

Course Outcomes: On completion of this course, the student will be able to:

- i. To introduce the students with of the components of a graphics system and become familiar with building approach of graphics system components and algorithms related with them.
- ii. Provide an understanding of how to scan convert the basic geometrical primitives, how to transform the shapes to fit them as per the picture definition.
- iii. Provide an understanding of mapping from a world coordinates to device coordinates, clipping, and projections.
- iv. To implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.
- v. To describe the importance of viewing and projections.

This laboratory course will comprise as exercises to supplement what is learnt under paper based on paper **BVSD 601 E1Computer Graphics**

The breakup of marks for the practical will be as under:

i.	Lab Record (Internal Assessment)	10Marks
ii.	Viva Voce (External Evaluation)	20 Marks
iii.	Program Development and Execution(External Evaluation)	20 Marks

BVSD 604

Software Lab – IX Based on BVSD 601 E2 Image Processing

MaxMarks:50

ExternalExamination:50

Min Pass Marks: 35%

Lectures to be delivered: 45-55Hrs

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This laboratory course will comprise as exercises to supplement what is learnt under paper based on paper BVSD 601 E2 Image Processing

The breakup of marks for the practical will be as under:

i.	Lab Record (Internal Assessment)	10Marks
ii.	Viva Voce (External Evaluation)	20 Marks
iii.	Program Development and Execution(External Evaluation)	20 Marks

BVSD 605-Software Lab – X (based on paper BVSD-602 E1)

Maximum Marks: 50
External Examination: 50

Maximum Time: 3 Hrs.
Minimum Pass Marks: 35%
Lectures to be delivered: 45-55 hrs

Objectives of the Lab:

- To develop web pages using ASP.NET
- To use ASP.NET controls in web applications.
- To debug and deploy ASP.NET web applications

Syllabus Contents:

This laboratory course will comprise as exercises to implement what is learnt under paper **BVSD 602 E1**

The students will create the web pages using:

1. Standard controls in a web form.
2. List controls and its functions.
3. File upload and calendar control.
4. Create an admission form for a college.
5. Demonstrate the master page.
6. Create a login page which accepts user name and password, then check for authentication of the user.
7. Validation Controls
8. User control that displays the current date and time. Include it in a Web Form and refresh it each time a button is clicked.
9. ADO.NET controls
10. Submits data in the database by using the ado.net controls.

The breakup of marks for the practical will be as under

i.	Lab File Record (External Assessment)	10 Marks
ii.	Viva Voce (External Evaluation)	20 Marks
iii.	Program Development and Execution(External Evaluation)	20 Marks

BVSD 605- Software Lab – X (based on paper BVSD-602E2)

Maximum Marks: 50
Minimum Pass Marks: 35%

External Examination: 50
Lectures to be delivered: 45-55 hrs

Objectives of the Lab:

After the completion of the course, students will get hands-on experience on various techniques of web development and will be able to design and develop a complete website

Course Outcomes: On completion of this course, the student will be able to:

- i. Test and debug a PHP application
- ii. Use cookies and sessions
- iii. Work with regular expressions, handle exceptions and validate data.

This laboratory course will comprise as exercises to supplement what is learnt under paper based on paper **BVSD 602 E2**

The breakup of marks for the practical will be as under:

i.	Lab Record (Internal Assessment)	10 Marks
ii.	Viva Voce (External Evaluation)	20 Marks
iii.	Program Development and Execution(External Evaluation)	20 Marks

BVSD 605-Software Lab – X (based on paper BVSD-602 E3)

Maximum Marks: 50

Minimum Pass Marks: 35%

External Examination: 50

Lectures to be delivered: 45-55 hrs

Course Objectives:

The objective of the course is to enable the students to understand and build web applications quickly and efficiently with the help of JavaScript.

Course Outcomes: On completion of this course, the student will be able to:

- Installation of Node JS.
- Creating a web server.
- Connect Node Js with database

This laboratory course will comprise as exercises to supplement what is learnt under paper based on paper BCA-602 E3 Node Js

The breakup of marks for the practical will be as under:

i.	Lab Record (Internal Assessment)	10 Marks
ii.	Viva Voce (External Evaluation)	20 Marks
iii.	Program Development and Execution(External Evaluation)	20 Marks

BVSD 606-Project

Maximum Marks: 100

External Examination: 50

Minimum Pass Marks: 35%

Internal Assessment:50

Lectures to be delivered: 45-55 hrs

Course Objectives:

The objective of the course is to enable the students to understand team work.

Course Outcomes: On completion of this course, the student will be able to:

- Learn critical thinking skills and inquiring skills through application-oriented project development in team-work environment.
- Learn problem solving skills.

Project Marks Distribution

CODE	TITLE OF PAPER	MAXIMUM MARKS
BVSD 606	Project	
	Internal assessment	50
	External Examination	50
	Total	100

1. The evaluation committee will distribute these marks for seminar/viva/project report, presentation and for any other activity, which the committee thinks to be proper.

2. Joint projects will be allowed (not more than two students) and individual project reports will be accepted. Individual project reports will be recognized and the students should highlight their contributions in a joint project report.

Committee for Evaluation of project report/work:

- i. Head of the Department
- ii. Internal Guide
- iii. External Examiner