Shree H.V.P. Mandal's

Degree College of Physical Education, Amravati.

(Multi-faculty Autonomous College)

FACULTY OF SCIENCE AND TECHNOLOGY

Master of Vocation (Software Development)

M. Voc. (Software Development)

Syllabus

(Choice Based Credit System)

Program Code: MVSD

Introduced from the session 2020-2021

Subject Code	20MVSD101	
Subject Name	Business Communication and Personality Development	
Total Lectures	60	
Total Credits	4	
Unit	Contents	Hours
I	**Soft Skills:** An Introduction – Definition and Significance of Soft Skills; Process, Importance and Measurement of Soft Skill Development, Soft skills vs Hard Skills. **Self-Discovery:** Discovering the Self; Setting Goals; Beliefs, Values, Attitude, Virtue. **Positivity and Motivation:** Developing Positive Thinking and Attitude; Driving out Negativity; Meaning and Theories of Motivation; Enhancing Motivation Levels, Power Lessons and Strategies of Armed Forces.	14
II	**Language Skills**: Speech, Grammar, Vocabulary, Phrase, Punctuation. **Fluency building**: What is fluency – Why is fluency important – Types of fluency – Oral fluency – Reading fluency – Writing fluency – Barriers of fluency – How to develop fluency. Speaking Skills Formal and Informal Conversation, **Interpersonal Communication:** Interpersonal relations; communication models, essential Email writing skills; Email Etiquettes; **Employment Communication** – Resumes and Cover Letters: Introduction, Writing a Resume, Writing Job Application Letters, Leave applications and Simple letter Writing. **Group Discussions and Interviews:** Introduction, What is a Group Discussion? Attending Job Interviews	16
III	**Basic Principles of Communication**: Introduction, Understanding Communication, the Communication Process, Barriers to Communication, the Importance of Communication at the Workplace, **Types and Channels of Communication:** Introduction, Types of Communication, Classification of Communication Channels. **The Nature of Business Communication**: Introduction, Types of Business Communication, Communication Network in Organizations, **The Importance of Listening at the Workplace**: Introduction, what is listening? Barriers to Listening, Strategies for Effective Listening, Listening in a Business Context.	14
IV	**Developing Oral Business Communication Skills:** Introduction, Advantages of Oral Communication, Oral Business Presentations, **Reading Skills for Effective Business Communication:** Introduction, what is reading? Types of reading, SQ3R Technique of Reading **Internal Business Communication-Guidelines for Meetings:** Introduction, Types of Meetings, Before the Meeting, During the Meeting, After the Meeting, and Common Mistakes made at Meetings, **Internal Business Communication:** Writing Memos, Circulars and Notices: Introduction, What are Memo, Circulars and Notices. Writing Business Letters: Introduction, Principles, Types and format of Business Letters. **Writing Business Reports:** What is a Report? Types and formats of Business Reports, Steps in Report Preparation.	16
Text Books	1. Soft skills Training – A workbook to develop skills for employment by Fredrick H. Wentz 2. Personality Development and Soft skills , Oxford University Press by Barun K. Mitra 3. Business Communication by Bhatia	
Reference Books:	1. Managing Soft Skills for Personality Development – edited by B.N.Ghosh, McGraw Hill India, 2012. 2. English and Soft Skills – S.P.Dhanavel, Orient Blackswan India, 2010	

Subject Code	**20MVSD102**
Subject Name	Problem Solving Techniques and OOP
Total Credits	**04**
Total Hours	**60**

Unit No	Contents	Total Hrs
1	**Introduction to Programming:** How to develop a program, Algorithms, Flow-charts, Testing and Debugging a program, Program Documentation. **Basics of Programming**: Data types, constants, variables, macros, overflow and underflow of data, Operators, Expressions, precedence and associativity of operators, type conversion. Input and Output: Character I/O, formatted I/O, **Decision Making and Branching,** if, if..else, goto, conditional operator, switch statement.	14
2	**Looping Sructures:** while, do-while and for loops, break and continue statements. **S**olving problems with iteration, divide and conquer methods. **Functions:** Defining and using functions: function declaration, definition and calling, call by value and call by reference, recursion. **Storage Classes**: Scope & life of variables, auto, extern, static, register storage classes, spanning code into multiple files, standard library functions, defining our own string handling and math functions. **Arrays**: defining array, searching, sorting, binary search, finding Mean, Mode, Median, Variance, Standard Deviation, defining and using matrix	16
3	**Pointers**: pointer variables, initialization **pointer and array**: array of pointers, pointer to array **Dynamic Memory Allocation:** using malloc, calloc, realloc, free and delete operators**, Handling Strings:** defining strings, searching different types of characters in strings, searching for patterns, splitting strings into tokens separated by delimiters, identifying and counting different types of tokens in a string, table of strings. **Structures:** Defining & initializing structure, structure to represent entities and use in problem solving, structure and array. **Unions:** Definition and use, union vs. struct, **File Handling:** file pointer, modes of opening file, text files, binary data files, file I/O	16
4	**Introduction to OOP:** What is OOP, Characteristics of OOP, Class, Object, Abstraction, Encapsulation, Constructors and Destructors, Inline Functions, the this pointer, function overloading, operator overloading, Inheritance, access specifiers, single, multiple and multilevel inheritance, function overriding, polymorphism	14
Text Books:	**1.** Kanetkar Y P, "Let us C", BPB Publications. **2.** Byron S Gottfried "Programming with C", Tata McGrawhill. **3.** Scott Robert Ladd, "Applying C++", BPB Publication.	

Reference Books	1. Hanly J R & Koffman E.B, “Problem Solving and Programm design in C”, Pearson Education, 2009. 2. B. W. Kernighan & D. M. Ritchie, “The C Programming Language”, Pearson Education. 3. E. Balagurusamy, “Programming with ANSI-C”, Tata McGraw Hill. 4. Venugopal K. R and Prasad S. R, “Mastering „C“”, Tata McGrawHill. Kochen Stefan, “Programing in C”, 5. Neil Graham, “Learning C++”, Tata McGrawHill.	

Subject Code	**20MVSD104**	
Subject Name	**Design and Management of Computer Networks**	
Total Lectures	**56**	
Total Credits	**4**	
Units	**Contents**	**Total Hours**
Unit - I	Fundamentals of Networking : Introduction about Networking , Computer Network Architecture, Computer network type: LAN(Local Area Network),PAN(Personal Area Network),MAN(Metropolitan Area Network),WAN(Wide Area Network) Topology: Bus ,Ring, Star, Tree,	14
Unit – II	Overview: Layered Architecture, The OSI model, TCP/IP protocol, Comparison of the OSI & the TCP/IP Models, Physical ,Logical, Port and Specific address, Switching techniques, IP Addressing, Types of IP Address, Versions of IP address.	14
Unit - III	NETWORK ADDRESS TRANSLATION (NAT), TCP,UDP and SCTP protocols, Uniform Resource Locator(URL), Domain Name services(DNS), Resolution – Mapping Names to Address and Address to Name, Electronic Mail Architecture, SMTP,POP and IMAP,TELNET and FTP,DHCP Protocols	14
Unit – IV	NETWORK MANAGEMENT: Network Management Architecture, OSI Management Model, SNMP Management Architecture, TMN Management Architecture, Administration Via Www. Network Management Protocol, Simple Network Management Protocol (SNMP)	14
Text Book:	1. S. Tanenbaum (2003), Computer Networks, 4th edition, Pearson Education/ PHI, New Delhi, India	
Reference Books:	1. Behrouz A. Forouzan (2006), Data communication and Networking, 4th Edition, Mc Graw-Hill,India. 2. Kurose, Ross (2010), Computer Networking: A top down approach, Pearson Education, India	

Subject Code	**20MVSD105**
Subject Name	**Cloud Architecture Design and Administration**
Total Lectures	**60**
Total Credits	**4**

Units	**Contents**	**Total Hours**
I	Basic Concepts: Introduction cloud computing, History, Working, Benefits, Characteristics, Application, and Deployment Models: public, private, hybrid, Service Model: SAAS, PAAS, LAAS, Cloud Computing Architecture, Cloud infrastructure.	15
II	Cloud Computing Technologies: Parallel vs. distributed computing, Elements of parallel computing: Hardware architectures for parallel processing, Approaches to parallel programming, Laws of caution, and Elements of distributed computing: definition, component, Grid Computing, Utility Computing.	15
III	Virtualization: Introduction, Characteristics of virtualized environments, Taxonomy of virtualization techniques, Virtualization and cloud computing, Pros and cons of virtualization, Technology example: VMware: full virtualization.	15
IV	Storage in Cloud: Storage system architecture, Big data, Virtualized data centre(VDC) architecture, VDC Environment, Clouds file systems: GFS and HDFS, BigTable, HBase and Dynamo. Features and comparisons among GFS, HDFS	15
Text Books:	1. Rajkumar Buyya, "Mastering Cloud computing", McGraw Hill 2. Rajkumar Buyya, "Cloud computing principles and paradigms", Wiley	
Reference Books	1. Gautam Shroff, Enterprise Cloud Computing, Cambridge 2. Dr. Kumar Saurabh,"Cloud Computing", Wiley Publication 3. Pranab kumar Dasgupta, Manojranjan Nayak, Sabyasachi Pattnaik "Cloud Computing- Based Projects using Distributed Architecture", PHI. 4. Greg Schulr, "Cloud and virtual data storage networking", CRC Press 5. Barrie Sosinsky,"Cloud Computing", Wiley India	

Practical Subjects

Subject Code	**20MVSD103**
Subject Name	**Lab1-Based on 20MVSD101 and 20MVSD 102**
Total Lectures	**150 Hours**
Total Credits	**6**
Platform to be used	**C programing Language** **English Language Laboratory**

Subject Code	**20MVSD106**
Subject Name	**Lab Based on Design and Management of Computer Networks**
Total Lectures	**120 Hours**
Total Credits	**4**
Platform to be used	**Windows 10 Networking, Linux OS Networking**

Subject Code	**20MVSD107**
Subject Name	**Lab Based on Cloud Architecture Design and Administration**
Total Lectures	**120 Hours**
Total Credits	**4**
Platform to be used	**Cloud monitoring tools:** One or more of Amazon Cloudwatch, Microsoft Cloud monitoring, AppDynamics, Retrace etc. (Any one) **Configuration management tools:** One or more of Puppet, Chef, Ansible, CFEngine, JUJU, Bamboo (Any one) **Workflow management tools:** One or more of Evernote, Jira, VersionOne, Workzone, Scrum Mate etc. (Any One)

Syllabus
M. Voc. (Software Development)
Semester-II

Programme Name	M. Voc. (Software Development)	**Programme Code**	MVSD2020
Course Title	RDBMS Concepts and MySQL	**Course Code**	20MVSD201
Total Credits	04	**Total Hours**	56
Prerequisites	1. Knowledge data types, data structures and file management. 2. Basic DBMS concepts. 3. Knowledge of Set theory.		

Unit No	**Contents**	**Total Hrs**
1.	Overview of database System:A Historical Perspective, Describing and Storing Data in a DBMS:The Relational Model,Levels of Abstraction in a DBMS, Data Independence,Structure of a DBMS,People Who Work with Databases, Database Design and ER Diagrams Entities, Attributes, and Entity Sets, Relationships and Relationship Sets	14
2	Introduction to the Relational Model, Integrity Constraints over Relations, Enforcing Integrity Constraints, Logical Database Design: ER to Relational,Relational Algebra,Relational Calculus.	14
3	SQL:DDL, DML,DCL commands ,UNION, INTERSECT, and EXCEPT,Nested Queries,Aggregate Operators,Logical Connectives AND, OR, and NOT,Complex Integrity Constraints in SQL, Joins, Trigger	14
4.	Introduction: MySQL, Why Is MySQL so Popular?, Elements of MySQL and Its Environment, Installing MySQL,Working with Database Structures, Managing Users and Privileges,Backups and Recovery, Web Database Applications with PHP	14
Text Books	1.Database Management Systems,Raghu Ramakrishnan, Johannes Gehrke, Third Edition,McGraw-Hill. 2. Learning MySQL , Seyed M.M. “Saied” Tahaghoghi and Hugh E. Williams,O’Reilly Media.	

M. Voc. (Software Development)

Semester-II

Programme Name	M. Voc. (Software Development)	**Programme Code**	MVSD2020
Course Title	Statistical Concepts	**Course Code**	20MVSD202
Total Credits	04	**Total Hours**	60
Prerequisites	1. Elementary mathematics		

Unit No	**Contents**	**Total Hrs**
1	**Probability.** Definition and interpretation, Bayes' theorem, random variables, probability density functions, expectation values, transformation of variables, error propagation. **Probability functions.** Binomial, multinomial, Poisson, uniform, exponential, Gaussian, chi-square, Cauchy distributions	15
2	**The Monte Carlo method.** Random number generators, the transformation method, the acceptance-rejection method. **Statistical tests.** Significance and power of a test, choice of the critical region. Constructing test statistics: the Fisher discriminant, neural networks, etc. Testing goodness-of-fit, chi-square test, P-values. **Parameter estimation: general concepts.** Samples, estimators, bias. Estimators for mean, variance, covariance.	15
3	**The method of maximum likelihood.** The likelihood function, ML estimators for parameters of Gaussian and exponential distributions. Variance of ML estimators, the information inequality, extended ML, ML with binned data. **The method of least squares.** Relation to maximum likelihood, linear least squares fit, LS with binned data, testing goodness-of-fit, combining measurements with least squares	15
4	**Interval estimation.** Classical confidence intervals: with Gaussian distributed estimator, for mean of Poisson variable. Setting limits, limits near a physical boundary. **Nuisance parameters, systematic uncertainties.** Connection between systematic uncertainty and nuisance parameters. Profile likelihood, Bayesian treatment, marginalization with MCMC. **Examples of the Bayesian approach.** Bayesian treatment of non- Gaussian systematic errors. Model selection using Bayes factors.	15
Text Books	Statistical Data Analysis,By: Glen Cowan,Oxford Science Publication. EBook: http://www.sherrytowers.com/cowan_statistical_data_analysis.pdf	

M. Voc. (Software Development)

Semester-II

Programme Name	M. Voc. (Software Development)	**Programme Code**	MVSD2020
Course Title	Lab1-Based on RDBMS and Basic Statistical Concepts	**Course Code**	20MVSD203
Total Credits	03	**Total Hours**	60
Prerequisites	1. Knowledge Programing logic and Program design, I/O Design 2. Basic Programing Concepts and Knowledge of a Programing Language 3. Knowledge of database concepts and using a DBMS		

Unit No	Contents	Total Hrs
Part I	**Based on Statistical Concepts:** 10 Practicals to be performed based on core contents of the syllabus of the subject. Student can use any programming language (C, C++, Java or Python) to implement the programs.	**30**
Part II	**Based on RDBMS/MySQL:** 10 Practicals to be performed based on core contents of the syllabus of the subject. MySQL will be used in back end. Any language (C, C++, Java, Python or HTML) can be used to develop front end.	**30**

M. Voc. (Software Development)

Semester-II

Programme Name	M. Voc. (Software Development)	**Programme Code**	MVSD2020
Course Title	Machine Learning and Business Intelligence	**Course Code**	20MVSD204
Total Credits	04	**Total Hours**	56
Prerequisites	1. Knowledge of Basic statistical Concepts		

Unit No	**Contents**	**Total Hrs**
1	ML Modeling Flow , Parametric and Non-Parametric ML Algorithm , Types of ML , Performance Measures , Bias-Variance Trade-Off , **Overfitting and Underfitting,** Linear Regression, Linear Regression with OLS , Linear Regression with SGD , Evaluating Model Parameters , L1 and L2 Regularization , Measuring Performance Metrics Logistics Regression, Logistic Regression MLE , Logistic Regression with SGD , Evaluating Model Performance , Measuring Performance Metrics: Precision, Recall, AUC, ROC, etc	15
2	**Decision Trees** Intro to Decision Tree , Entropy and Information Gain , Standard Deviation Reduction , Gini Index , CART and CHAID, Performance Metrics **Random Forests** Bootstrap Sampling , Bagging (Bootstrap Aggregation) , Intro to Random Forest , Why Random Forest , Performance Metric	15
3	**K-Nearest Neighbours(K-NN)** What is KNN? , KNN Algorithm , Working of KNN , How to choose the value of K (Elbow Method) **Support Vector Machines(SVM)** Understanding Vectors , Decision Boundary , Support Vectors , Understanding Hyperplane , What is Support Vector Machine , Working of SVM , Kernels and Types of Kernels , Strengths and Challenges of SVM Ensemble Techniques, Boosting , Ada Boost , Gradient Boosting , XG Boost	15
4	**Principal Component Analysis** , Intro to Dimensionality Reduction , What is PCA? , Computing Components in PCA , Dimensionality Reduction using PCA **K-Means Clustering** , Intro to Clustering , What is K-Means Clustering? , K-Means Clustering Algorithm , Choosing the Optimum K value (Elbow Method) , Various Distance Measures Time Series: Understanding Time Series Data , Visualizing and Understanding Time Series Components , Auto covariance , ACF and PACF , Autoregressive models: AR, MA, ARMA, ARIMA , Exponential Smoothing , Holt-Winter's Model	15
Text Books	Statistical Data Analysis, by Glen Cowan, Oxford Science Publication. e-Book: http://www.sherrytowers.com/cowan_statistical_data_analysis.pdf	

M. Voc. (Software Development)

Semester-II

Programme Name	M. Voc. (Software Development)	**Programme Code**	MVSD2020
Course Title	Ellective-II : Advanced Java Programming	**Course Code**	20MVSD205
Total Credits	04	**Total Hours**	60
Prerequisites	1. Basic Concepts of Programing and Software Development 2. Knowledge of OOP concepts and programming 3. Fundamentals of Java and applets.		

Unit No	**Contents**	**Total Hrs**
1	Java Network Programing: URL class, displaying data of a web page, InetAddress class, Creating and Using TCP sockets: Socket and ServerSocket classes, Creating and Using UDP socket: DatagramSocket and DatagramPacket, Creating client Server application using TCP Sockets, Creating client server application using UDP Sockets, Java Telephone API, JAVA mail API.	15
2	JDBC Drivers, Steps to connect to the database, Connectivity with Oracle, Connectivity with MySQL, Connectivity with Access without DSN, DriverManager, Connection interface, Statement interface, ResultSet interface, PreparedStatement, ResultSetMetaData, DatabaseMetaData, Storing image, Retrieving image, Storing file, Retrieving file, Stored procedures and functions, Transaction Management, Batch Processing, scrollable and updatable resultset.	15
3	Servlets: Introduction, Web application Architecture, HTTP Protocol & HTTP Methods, Web Server & Web Container, Servlet Interface, HTTPServlet, GenericServlet, Servlet Life Cycle, Servlet Config, Servlet Context, Servlet Communication: Servlet-Browser Communication- sendError, setHeader, send, Redirect, Web-Component Communication- Forward, Include, Servlet-Applet Communication, Session Tracking Mechanisms: Session Object, Cookies, URL-Rewriting, Hidden-Form Fields,	15
4	JSP: Introduction, LifeCycle, JSP Scripting Elements:declaratives, scriptlets, expressions,Implicit Objects, JSP Directives: page, include, taglib,JSP Standard Actions: useBean tag, setProperty tag, getProperty tag.	15
Text Books	1. Java: The Complete Reference, Seventh Edition - by Herbert Schildt , McGraw Hill Education; 9th edition 2. J2EE: The Complete Reference, 1st edition - by Jim Keogh, McGraw Hill Education 3. JDBC API Tutorial and Reference (Java Series) - by Maydene Fisher , Jon Ellis, Jonathan Bruce, Addison Wesley; 3rd edition	
Reference Books	4. Programming with Java, 6th Edition, by E Balagurusamy , McGraw-Hill 5. Java: How to Program, 9th Edition, by Paul Deitel, Harvey M. Deitel, Pearson College Division 6. Core Java: Fundamentals 10th Edition, by Cay S. Horstmann, Pearson PTR	

M. Voc. (Software Development)

Semester-II

Programme Name	M. Voc. (Software Development)	**Programme Code**	MVSD2020
Course Title	**Lab2-Based on ML and BI using Python**	**Course Code**	20MVSD206
Total Credits	03	**Total Hours**	60
Prerequisites			

Unit No	**Contents**	**Total Hrs**
Part I	INTRO TO PYTHON Jupyter Environment , Pseudocode , Using Print () , Wrong usage of print() , Variables , Creating a variable , Reassign a variable , Multiple variable assignment , Data Types , Data type conversion (Implicit) , Data type conversion (Explicit) , Arithmetic Operations, String Operations , Boolean Operations , String handling , Concatenation , If-else, loops PYTHON OBJECTS What is Tuple? , Creating tuple , Tuple operations , Tuple: In-built function , What is a list? , Creating a list , List operations , List: In-built functions , List Joins , What is a dictionary? , Dictionary operations , Dictionary in-built functions , Conditional statements: if else , Conditional statements: nested if	**20**
Part II	**Python Libraries:** **NUMPY** : What is python numpy , Functions to create array , Numpy operations - dtypes, size, shape, reshape, itemsize , Indexing array , Slicing array , Arithmetic operations on array , Arithmetic functions on array - sum(), min() , Concatenation of Arrays **PANDAS** : Python pandas , Data structures , What is series? , Creating a series , Manipulating series , Usage if .loc and .iloc , What is a dataframe? , Creating a dataframe **DATA FRAME MANIPULATION** : Manipulating dataframes , Indexing a dataframe , Read data from various sources , Concatenate the dataframes , Merge using inner join , Merge using outer join , Merge using right join , Merge using left join , Reshape using melt() function , Check for duplicates **VISUALIZATION (Plots) :** using Matplotlib , Line plot , Scatter plot , Bar plot , Pie plot , Histogram , Box plot , Plots using Seaborn , Strip plot , Pair plot , Distribution plot , Count plot , Heatmap **EDA** : Summary Statistics , Missing Value Treatment , Dataframe analysis using groupby() , Advanced Data Explorations	**40**

M. Voc. (Software Development)

Semester-II

Programme Name	M. Voc. (Software Development)	**Programme Code**	MVSD2020
Course Title	**Lab3-Based on Elective-II Advanced Java Programming**	**Course Code**	20MVSD207
Total Credits	03	**Total Hours**	60
Prerequisites			

Unit No	**Contents**	**Total Hrs**
Part I	5 Practicals to be performed based on Java Network Programming 5 Practicals to be performed based on JDBC Suitable IDE like eclipse, netbeans, etc. may be used	**30**
Part II	5 Practicals to be performed based on Servlet Programming 5 Practicals to be performed based on JSP Suitable IDE like eclipse, netbeans, etc. may be used	**30**

Programme Name	M. Voc. (Software Development)	**Programme Code**	MVSD2020
Course Title	Bridge Module: Employability Skills	**Course Code**	**20MVSD208**
Total Credits	02	**Total Hours**	30
Prerequisites			

Unit No	**Contents**	**Total Hrs**
1	Entrepreneur and Entrepreneurship, Role and functions of Entrepreneur, Identify and analyze the traits/qualities required for an Entrepreneur, Entrepreneurial motivation, performance and record, Entrepreneurial opportunities, Identify and analyse the abilities of an Entrepreneur, Sources of Business Ideas	8
2	The process of setting up a Small Business (a schematic representation), Micro, Small and Medium Enterprises (MSME), sales and distribution management , Method of Marketing, Advertisement & Publicity, Market mix , SWOT and Risk analysis, Role of various schemes and Institutes for self-employment, Project formation, feasibility, legal formalities, Filling up the preliminary project report proforma	7
3	Occupational Safety and Health Introduction to Occupational Safety and Health, Basic hazard, Chemical hazard, and Mechanical hazards, Accident & Safety, Awareness and use of Personal Protective Equipment, Fire safety, First Aid Care and Transportation of Injured Person, Idea of basic provisions for OSH, Safety and Health	8
4	Environment Education Introduction to Environment, Eco-system & factors causing imbalance, Pollution and Pollutants, Conservation of Energy, Reuse and Recycle, Global warming - Ozone Layer Depletion, Hydrological cycle - Ground and Surface water, Water treatment, Rain water harvesting	7
Text Books		

M. Voc. (Software Development)

Semester-II

Programme Name	M. Voc. (Software Development)	**Programme Code**	MVSD2020
Course Title	**Online Course based on Advanced Technology**	**Course Code**	**20MVSD209**
Total Credits	02	**Total Hours**	As per online Course (But not less than 30 Hours)
Prerequisites	As per online course		

Unit No	**Contents**	**Total Hrs**
	1. This course is to be selected by the students from available MOOCS through platforms like SWAYAM, NPTEL, etc. 2. The college mentor would help students in selecting the course. **3.** The students will have to produce certificate of course completion to get the credits earned included 4. In case the student can't complete MOOCS course for any reason they will have to compulsorily complete a course offered by the college. **5.** The assessment of the course would be done on the basis of Viva and Assignments, and Online test.	As per online Course

Programme Name	M. Voc. (Software Development)	**Programme Code**	MVSD2020
Course Title	**Mini Project**	**Course Code**	**20MVSD210**
Total Credits	03	**Total Hours**	45
Prerequisites	As per online course		

Unit No	**Contents**	**Total Hrs**
	1. Students have to develop a software based on the technologies learnt in this programme. 2. The Software can be a Web application, a mobile application or stand alone application. 3. The students would be allocated a guide from the teaching faculty or from the industry having MoU with the college, who will mentor them in software development. **4.** The guide will be mentoring the students in with respect to technology used,	**45**

Shree H. V. P. Mandal's

Degree College of Physical Education, Amravati.

(A Multi-Faculty Autonomous College)

SYLLABUS

OF

Master of Vocation (Software Development)

M. Voc. (Software Development)

(Credit Based Semester Pattern)

Program Code: MVSD2020

Year of Introduction : 2020-2021

SYLLABUS

of

Semester-III

(Year 2021-2022)

Syllabus

M. Voc. (Software Development)
Semester -III

Programme Name : M. Voc. (Software Development)		**Programme Code: MVSD2020**
Course Name: Software Project Management and Skill Competence		
Course Code: 20MVSD301		**Short Name:** SPMSC
Total Credits: 4	**Total Teaching Hours: 56**	**Max. Marks:70**

Prerequisites :

- Basic Skills of program design and development
- Knowledge of Software Development Life Cycle
- Knowledge of database design concepts

Course Objectives:

- To provide knowledge of different aspects of Software Projects Management To impart knowledge of designing and planning software development task.
- Estimating time and cost required from initial to the final phase of software development.
- Plan and schedule activities in the process of software development.

Course Outcomes:

At the end of the course, the student will be able to:

- Apply project management concepts and techniques to an IT project.
- Explain project management in terms of the software development process
- Analyze and design the software architecture
- Describe the responsibilities of IT project managers
- Understand techniques to work in a group as team leader or active team member on an IT project
- Design various estimation levels of cost and efforts
- Identify issues that could lead to IT project success or failure

Unit	**Contents**	**Hours**
I	What is a project?, Software projects versus other types of project, Activities covered by Software project management, Some ways of categorizing Software projects, The project as a System, What is management?, Problems with Software projects, Management control, Stakeholders, Requirement specification, Information and control in organizations, Step Wise project planning, Project evaluation, Strategic and Technical assessment, Costbenefit analysis, Cash flow forecasting, Risk evaluation	12

II	Selection of an appropriate project approach, Choosing technologies, Technical plan contents list, Choice of process models, Structured methods, Rapid application development, The waterfall model, The V-process model, The spiral model, Software prototyping, Other ways of categorizing prototypes, Tools, A prototyping example, Incremental delivery, An incremental example, Selecting the most appropriate process model	12
III	Software effort estimation, Where are estimates done?, Problems with over- and under-estimates, basis for Software estimating, Software effort estimation techniques, Expert judgments, Estimating by analogy, Albrecht function point analysis, Function points Mark II, Object points, A procedural code-oriented approach, COCOMO: a parametric model, Activity planning, The objectives of activity planning, When to plan, Project schedules, Projects and activities, Sequencing and scheduling activities, Network planning models, Formulating a network model, Using dummy activities, Representing lagged activities, Adding the time dimension, The forward pass, The backward pass, Identifying the critical path, Activity float, Shortening the project duration, Identifying critical activities, Precedence networks	16
IV	Managing people and organizing teams: Understanding behavior, Organizational, behavior, Selecting the right person for the job, Instruction in the best methods, Motivation, Working in groups, Becoming a team, Decision making, Leadership, Organizational structures, Software quality, The place of Software quality in project planning, The importance of Software quality, Defining Software quality, ISO 9126, Practical Software quality measures, Product versus process quality management, External Standards, Techniques to help enhance Software quality, Small projects, Some problems with Student projects, Content of a project plan	16
Text Book	Software Project Management by Bob Hueges and Mike Cotterel, McGrawHill	
Ref Books	Software Engineering: A practioner's approach by Roger Pressman, Software Engineering by Ian Sommerwille, Addision Wessley	

Programme Name : M. Voc. (Software Development)		**Programme Code:** MVSD2020
Course Name: Elective-III: Advanced Web Development		
Course Code: 20MVSD302		**Short Name: EL-III AWD**
Total Credits: 4	**Total Teaching Hours:** 56	**Max. Marks:**70

Prerequisites :

- Knowledge of Basics HTML
- Knowledge of Internet Concepts, Web Server, Web Browser
- Basic Programming skills
- Basic Knowledge of DBMS and SQL

Course Objective:

- To learn designing and develop web applications using Open Source

Technologies To learn web programming using scripting languages.

- To learn interfacing with databases through web applications

Course Outcomes:

- Ability to design and develop web pages using HTML5
- Ability to configure text, color, and page layout with Cascading Style Sheets.
- Able to use of images & multimedia on web pages.
- Acquire Skill of developing server and client side web applications using PHP and Javascript
- Ability to access data to and from databases using MySQL through web application

Unit	Contents	Hours
I	Web basics, Multitier Application Architecture, Client-Side Scripting versus Server-Side Scripting, World Wide Web Consortium (W3C). **HTML5**: Features, Editing, HTML5 structure, Headings, Linking, Images, Lists, Tables, Forms. **HTML5 New Elements**: **Form input type element**: colors, date, time, e-mail addresses, numbers, range, search, telephone numbers, URLs, **Data list Elements**. **Page-Structure Elements**: header, nav, figure, fig caption, article, summary, details, section, aside, meter, footer. **Audio & Video elements.**	15
II	**CSS**: Introduction, **basic properties**: text, list, border font, **Selectors**: universal, type, id, class. **CSS types**: Inline, Internal and External Style Sheets. **Client Side Programming (JavaScript**):HTML DOM, Java Script Looping structures: for, do-while, while. Break /Continue statements. JavaScript functions: Declaration, Definition, and Referencing. Identifiers scope rules, Recursion. Arrays; declaration, allocation and accessing. JavaScript objects: Math, String, Date, Number and Boolean.	15
III	**Server-Side Programming:** Introduction to PHP, Features, PHP variables, operators, data types. **Control Statement in PHP:** If Else, Switch. **Looping Statements** For, While, Do-While, Break statements. **PHP Array:** Array Types: Indexed Array, Associative Array, **PHP Functions:** Introduction to functions, declaring functions, function scope, passing arguments to function, Using String functions, Maths Functions	13

IV	**Processing of HTML and PHP:** Adding PHP to HTML or processing HTML form using GET, POST, SESSION, COOKIE variables. PHP File uploads and PHP, Downloads File, Exception and Error handling. **Database operations**: Operations with PHP, connecting to Mysql with PHP, selecting a database, building and sending query, SELECT, INSERT, DELETE, UPDATE. **PHP MySql Functions**: mysqli_affected_rows(), mysqli_num_rows(),mysqli_close(), mysqli_connect(), mysqli_num_fields(), mysqli_query(), mysqli_select_db()	13
Text Books	1. Paul Deitel, Harvey Deitel and Abbey Deitel, "Internet & World Wide Web: How to program", Fifth Edition Pearson ISBN 978-0-13-215100-9 2. Thomas A. Powell, "HTML & CSS: The Complete Reference" , Fifth Edition, McGraw-Hill, ISBN: 978-0-07-174170-5 3. Kogent Learning Solutions Inc, HTML5 Black Book: Covers CSS3, Javascript, XML, XHTML, Ajax, PHP and JQuery, Dreamtech Press, New Delhi, 2011 4. Michael K. Glass, Yann Le Scouarnec, Elizabeth Naramore, Gary Mailer, Jeremy Stolz, Jason Gerner, Beginning PHP, Apache, MySQL Web development, Wrox Publication. 5. Jason Gerner, Elizabeth Naramore, Morgan L. Owens, Matt Warden, Professional LAMP: Linux, apache, MySql and PHP5 Web development, Wrox Publication.	
Ref. Books	1. Lynn Beighley, Michael Morrison,Head first PHP and Mysql,Second Edition, Oreilly publication. 2. Luke Weling, Laura Thomas, PHP and MYSQL Web Development, Pearson Education. 3. Tim Converse, Joyce Park, PHP5 and Mysql Bible , Wiley publication	

Programme Name : **M. Voc. (Software Development)**		Programme Code: **MVSD2020**
Course Name: Big Data Analysis		
Course Code: **20MVSD304**		Short Name: **BDA**
Total Credits: **4**	Total Teaching Hours: **56**	Max. Marks:**70**

Prerequisites :

- Should have knowledge of one Programming Language (Java preferably)
- Practice of SQL (queries and sub queries)
- Exposure to Linux Environment.

COURSE OBJECTIVES:

1. Understand the Big Data Platform and its Use cases
2. Provide an overview of Apache Hadoop
3. Provide HDFS Concepts and Interfacing with HDFS
4. Understand Map Reduce
5. Provide hands on Hodoop Eco System
6. Apply analytics on Structured, Unstructured Data.

COURSE OUTCOMES:

After completing this course the students will be able to:

1. Identify Big Data and its Business Implications.
2. List the components of Hadoop and Hadoop Eco-System
3. Access and Process Data on Distributed File System
4. Manage Job Execution in Hadoop Environment
5. Develop Big Data Solutions using Hadoop Eco System
6. Analyze Infosphere BigInsights Big Data Recommendations.

Unit	Contents	Hours
I	**Introduction To Big Data and Hadoop** What is data Analytics, types of data analytics, Life Cycle phases of data analytics, Introduction to Big Data, Big Data Analytics, Introduction to Apache Hadoop, Analysing Data with Hadoop, Hadoop Streaming, Hadoop Echo System, IBM Big Data Strategy, Introduction to Infosphere BigInsights and Big Sheets.	12
II	**HDFS (Hadoop Distributed File System)** The Design of HDFS, HDFS Concepts, Command Line Interface, Hadoop file system interfaces, Data flow, Data Ingest with Flume and Scoop and Hadoop archives, Hadoop I/O: Compression, Serialization, Avro and FileBased Data structures.	12
III	**Map Reduce** Anatomy of a Map Reduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution, Map Reduce Types and Formats, Map Reduce Features. Databases and Data Warehouses, NoSQL Data Management, document databases, relationships, graph databases, schema less databases, CAP Theorem etc.	16
IV	**Hadoop Eco System** **Pig :** Introduction to PIG, Execution Modes of Pig, Comparison of Pig with Databases, Grunt, Pig Latin, User Defined Functions, Data Processing operators. **Hive :** Hive Shell, Hive Services, Hive Metastore, Comparison with Traditional Databases, HiveQL, Tables, Querying Data and User Defined Functions. **Hbase :** HBasics, Concepts, Clients, Example, Hbase Versus RDBMS	16

Text Book	1. Data Science & Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, Published by John Wiley & Sons, Inc. 2. The Data and Analytics Playbook: Proven Methods for Governed Data & Analytic Quality, by Lowell Fryman, Gregory Lampshire, Dan Meers, Published by Morgan Kaufmann 3. Hadoop: The Definitive Guide, by Tom White, Published by O'Really	
Ref Books	1. Programming Hive by *Edward Capriolo, Dean Wampler, and Jason Rutherglen, published by O'Really* 2. Big Data In Practice: How 45 Successful Companies Used Big Data Analytics To Deliver Extraordinary Results, by Bernard Marr, Published By Wiley	

Programme Name : M. Voc. (Software Development)		**Programme Code:** MVSD2020
Course Name: Data Governance and Data Security		
Course Code: 20MVSD305		**Short Name:** DGDS
Total Credits: 4	**Total Teaching Hours:** 56	**Max. Marks:**70

Prerequisites :

- Knowledge about basic concepts on data and information
- Knowledge of Data Modeling
- Importance of data and data security for an organization

Course Objective:

- To learn importance of data governance
- To learn to design and define data governance policies
- To learn to design data security policies for an organization
- To learn data and practice governance tools

Course Outcomes:

At the end of this course the students will learn:

- What data should be governed
- Why data governance is important
- Basic concepts, principles, and practices of a data governance program
- Where and how to start a data governance program
- People and tools that enable a data governance program
- Techniques to measure success of a data governance program
- Governance of big data and cloud applications
- Importance of security of data and techniques and tools for data security

Unit	Contents	Hours
I	Introduction to Data Governance, Concepts behind Data Governance, Master data management, data quality and business intelligence, Priciples and Policies, Information Asset management, Data Governance Program Overview, CSFs for data governance, Business Case, Process overview for deploying data governance, Functional Design, Governing Framework Design	13
II	Data Governance Scope and Initiation, Access, Vision, Align and Business Value, Functional Design Governing framework design, Road Map,	13
III	Data governance artifacts and tools, Functional Design Governing framework design, Road Map, Data governance artifacts and tools	15
IV	Ingredients for Data Governance Success, The CDO Agenda, Organizing for Data Governance, Setting Data Policies, Data Security and Data Security Policies, Standards, and Processes, Monitoring Data Governance, Key Data Governance Activities on the Agenda of the Chief Data Officer, Data Security and Data Security Policies, How Database Resources and Data Security Policies Work Together.	15

Text Book	1. Data Governance How to Design, Deploy, and Sustain an Effective Data Governance Program by John Ladley, Morgan Kaufmann Publishers	
	2. The Chief Data Officer Handbook for Data Governance by Sunil Soares, MC Press Online	
Ref Books	1. Data Governance Tools by Sunil Soares, MC Press Online 2. Data Protection, Governance, Risk Management, and Compliance, By David Hills, CRC Press 3. Data Stewardship: An Actionable Guide To Effective Data Management And Data Governance by David Plotkin Morgan Kaufmann Publishers	

Practical Subjects

Subject Code	**20MVSD303**
Subject Name	**Lab Based on Elective-III**
Total Lectures	**90 Hours**
Total Credits	**3**

Subject Code	**20MVSD306**
Subject Name	**Lab Based on Big Data Analysis using Hadoop**
Total Lectures	**120 Hours**
Total Credits	**4**

Subject Code	**20MVSD307**
Subject Name	**Lab Based on Data Governance using R**
Total Lectures	**120 Hours**
Total Credits	**4**

Subject Code	**20MVSD308**
Subject Name	**Mini Project**
Total Lectures	**90 Hours**
Total Credits	**3**