

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD.



CIRCULAR NO./SYLLABUS./Faculty of SCIENCE TECH./B.VOC./56/2021.

It is hereby informed to all concerned that, on recommendation of Ad-hoc Board in Vocational Studies and Dean, Faculty of Science & Technology, the Hon'ble Vice-Chancellor has **accepted the curriculum of following B.Voc.Course under Choice Based Credit and Grading System** in his emergency powers under Section-12 [7] of the Maharashtra Public Universities Act, 2016 on behalf of the Academic Council as appended herewith:

Sr.No.	Course Name	Semester
1.	B.Voc in I.T. Skills & Software Development	V & VI

This is effective from the **Academic Year 2020-21, and 2021-22** and onwards. This curriculum is also available on the University website www.bamu.ac.in.

All concerned are requested to note the contents of the circular and bring notice to the students, teachers and staff for their information and necessary action.

University campus,
Aurangabad-431 004.
Ref. No.SU/B.voc./Curri./2020-21/

Date: 24.11.2021

3807-16


**Deputy Registrar,
Academic [Syllabus]
Section.**

Copy forwarded with compliments to :-

- 1] **The Principal All Affiliated Concerned College, Dr.Babasaheb Ambedkar Marathwada University, Aurangabad.**
- 2] **The Director, University Network & Information Centre, UNIC, with a request to upload the curriculum along with this Circular on University Website.**

Copy to :-

- 1] The Director, Board of Examinations & Evaluation, Dr.BAMU, A'bad
- 2] **The Concerned Section Officer, Examination Branch,**
- 3] The Section Officer, [Eligibility Unit],
- 4] **The Programmer [Computer Unit-1] Examinations,**
- 5] **The Programmer [Computer Unit-2] Examinations,**
- 6] The In-charge, [E-Suvidha Kendra],
- 7] The Public Relation Officer,
- 8] The Record Keeper,

SH/24112021/-

**DR. BABASAHEB AMBEDKAR
MARATHWADA UNIVERSITY
AURANGABAD**



**SYLLABUS OF
BACHELOR OF VOCATIONAL
IN
I.T. Skills & Software Development
Third Year SEMESTER V to VI
Choice Based Credit System**

Effective from the Academic Year
2020-21 & 22 Onwards

Dr. Babasaheb Ambedkar Marathwada University

Aurangabad-431004

NAAC Re-accredited with Grade 'A'



THIRD YEAR SYLLABUS

Bachelor of Vocation in

“IT Skills and Software Development”

(3 Years Program)

(With Effective From: 2018-19)



हे ज्ञानिची पवित्रता | ज्ञानीचि आथि ||

Approved
Zalte
26/11/21

Third Year									
SEMESTER – V									
Paper No.	Paper Title	No. of Credits	Lectures Per Week		Exam Pattern (Marks)				Total
			Th.	Pr.	Theory		Practical		
					CIA	ESE	CIA	ESE	
General Component									
GC501T	Campus to Corporate	4	4		20	80			100
GC502T	Entrepreneurship development	4	4		20	80			100
GC503T	Business Economics	4	4		20	80			100
Skill Component									
SC1504T	Unix Programming	4	4		20	80			100
SC1505T	Basic of Android Operating System	4	4		20	80			100
SC1506P	Practical Based on Unix Programming	3		6			30	45	75
SC1507P	Practical Based on Android OS	3		6			30	45	75
SC1508P	Software Testing Tools	4		8			50	50	100
	Total	30			100	400	110	140	750
SEMESTER – VI									
General Component									
GC601T	Data Science	4	4		20	80			100
GC602T	Human Resource Management	4	4		20	80			100
GC603T	Artificial Intelligence	4	4		20	80			100
Skill Component									
SC1604P	Industrial Internship	10					125	125	250
SC1605P	Project Work and Report	6		12			75	75	150
SC1606P	Seminar	2		4			30	120	50
	Total	30			60	240	230	320	750

[Signature] *[Signature]* 26/11/21



B. Voc. Third Year
(IT Skills and Software Development)
Semester - V

Course : B. Voc. in ITSSD Semester-V
Paper Title : Campus to Corporate

4-Credits
Paper No. 29: GC501T

Unit-I

15 L

Business Etiquettes, Etiquette Starts on the Phone, No Solicitation, Personal and Mass Emailing, Confidentiality and the Use of Company Funds and Equipment, Employee Theft – Though Shalt Not Steal, Dressing for work Nepotism in the Workplace, Disturbances, Insensitivity and Discrimination, Office Bullying, Entertaining Customer

Unit-II

15 L

Professional Ethics : Introduction, Terminology, Governing Edicts, Contextual Aspects, Personal Ethics, Professional Ethics, Ethical Dilemmas, Life Skills, Emotional Intelligence, Thoughts on Ethics, Value Education, Dimensions of Ethics, Setting Goals in Life.
Profession And Professionalism : Profession, Professional, Professionalism, Professional Associations, Roles of a Professional, Professional Risks, Professional Accountability, Professional Success, Ambition and Satisfaction, Ethics and Profession, Image of a Profession

Unit-III

15 L

Putting Things In Perspective: Introduction and Need for Transition, Corporate Expectations Scenario, Business Schools Scenario.

Personal Effectiveness Enhancement : 7Cs Model for Professional Excellence, Personality and Personality Development, Building Positive Mindset and Work Attitude, Values and Ethics, Innovation and Creativity, Work-Life Balance, Time Management, Managing Stress

Unit-IV

15 L

Technology Skills And Certifications: Introduction and Need for Technology Skills, Basic Information Technology (IT) skills, Higher Level Information Technology (IT) skills, Enterprise Resource Planning (ERP) Knowledge , Professional Memberships and Certifications.

Excelling Through Placement Process : Writing a Perfect Resume or CV, Success at Written Aptitude Test, Success at Group Discussions, Going through an Interview Process, Pre- and Post-Interview Follow-up

Text Book

1. Campus to Corporate: Your Roadmap to Employability by Gangadhar Joshi

References Books

1. Office Etiquette: The Unspoken Rules in the Workplace by Sonja L. Traxler
2. Campus To Corporate by Ashutosh Sharma.

Course : B. Voc. in ITSSD Semester-V
Paper Title: Entrepreneurship Development

4-Credits
Paper No. 30: GC502T

Unit I : Entrepreneurial Development Perspective

15 L

2. Evolution of the concept of Entrepreneur, Concepts of Entrepreneurship Development, Entrepreneur Vs. Entrepreneur, Entrepreneur Vs. Entrepreneurship, Entrepreneur Vs. Manager, Attributes and Characteristics of a successful Entrepreneur, Role of Entrepreneur in development of Indian economy

Unit II

15 L

Business organizations: - Meaning, types of business organization – Sole proprietorship, Partnership, Co-operative Society, Joint-Stock Company, Selection of an appropriate form of business organization.

Unit III

15 L

Creating Entrepreneurial Venture. Business Planning Process. Environmental Analysis - Search and Scanning Identifying problems and opportunities, Defining Business Idea.

Unit IV :

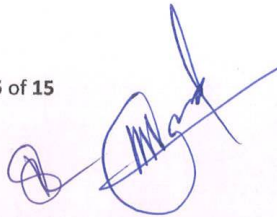
15 L

Project Identification & Report :-

Concept of project - project identification – formulation –appraisal-selection implementation and management–preparation of project report

Reference Books:

- 1) Vasant Desai : “The Dynamics of Entrepreneurial Development and Management, Himalaya Publishing House, Mumbai, Sixth Edition, 2010.
- 2) Khanka S. S., “Entrepreneurial Development”, Chand and Company Ltd, New Delhi, Third Revised Edition, 2001.
- 3) Prof. E. Gordon & K. Natarajan, “Entrepreneurship Development”
- 4) N.P. Singh, “Entrepreneurship Development”, - Theories & Practices.
- 5) M. Gangadhar Rao, “Entrepreneurship & Entertainment Development



Course : B. Voc. in ITSSD
Paper Title: Business Economics

Semester-V

4-Credits
Paper No. 31: GC503T

Unit I**15 L**

Introduction:- Meaning, Nature and Scope of Business Economics, Micro and Macro economics, its features and Importance.

Unit II**15 L**

Demand Analysis:- Introduction, Concept of Demand, individual Demand market Demand, Factors affecting on Demand Types of Demand, Law of Demand,

Unit III**15 L**

Elasticity of Demand:- Introduction, Concept ,types of elasticity of demand ,types of Price elasticity of Demand, factors Determining Elasticity of Demand, significance of Price Elasticity of Demand.

Unit IV**15 L**

Producers Behavior :- Introduction Concepts of Total Output, Stock and supply, Supply schedule, Determinants of market supply Law of supply, change in supply, Variation in supply, Concept of Elasticity of Supply and Types of Elasticity of Supply Measurement Determinants of Elasticity of Supply. Concepts of Cost, Total cost, Average cost and Marginal Cost.

Reference Books :

1. Managerial Economics - Analysis, Problems and Cases, P. L. Mehta, Sultan Chand and Sons, New Delhi.
2. Managerial Economics - Varshney and Maheshwari, Sultan Chand and Sons, New Delhi.
3. Managerial Economics - D. Salvatore, McGraw Hill, New Delhi.
4. Managerial Economics - Peterson and Lewis, Prentice Hall, New Delhi
5. Managerial Economics - G. S. Gupta , T M H, New Delhi.
6. Managerial Economics - Mote, Paul and Gupta, T M H, New Delhi.
7. Managerial Economics — D. C. Hague, Longmans.
8. Managerial Economics - Joel Dean, Prentice Hall, USA.
9. Managerial Economics - H L Ahuja, S Chand & Co. New Delhi.
10. A study of Managerial Economics – D.Gopalkrishna
11. Managerial Economics – D.C.Hauge
12. Managerial Economics – Reckie and Crooke
13. Managerial Economics, 4th Ed. – Craig Peterson



Course: B. Voc. in ITSSD **Semester - V**
Paper Title:- Unix Programming

3 - Credits
Paper No.32 : SC1504T

Unit-I**11L****Introducing UNIX**

The Operating System, The System Administrator, Logging In and Out, A Hands-On Session, How It All Clicked, POSIX and the Single UNIX Specification, Linux and GNU, The UNIX Architecture, Features of UNIX

UNIX Commands

Command Basics, Command Structure, Flexibility of Command, **man**: On-Line Help, The **man** Documentation, **echo**, **Printf**, **script**, **mailx**, **passwd**, **uname**, **who**, **date**, **stty**, **pwd**, **cd**, **mkdir**, **rmdir**, **ls**, **cp**, **mv**, **rm**, **cat** more, **pico**

Unit-II**11L****Shell**

The Shell as Command Processor, Shell Offerings, Pattern Matching—The Wild Card, The * and ?, The Character Class, Matching the, Rounding Up, Escaping and Quoting, Escaping, Quoting, Escaping in **echo**, Redirection, Standard Input, Output, The File Descriptor, Standard Error, Filters Collective Manipulation, /dev/null and /dev/tty: Two Special Files, Pipes, Creating a Tee, Command Substitution, Shell Variables, Effects of Quoting and Escaping, Where to Use Shell Variables, Shell Scripts, The Shell's Treatment of the Command Line, More Wild Cards

Unit-III**11L****Networking Tools**

TCP/IP Basics, Hostnames and IP Addresses, Resolving Hostnames and IP Addresses, /etc/hosts: The Hosts File, The Domain Name System (DNS), Client-Server: How Networked Applications Communicate, **ping**: Checking the Network, **telnet**: Remote Login, **ftp**: File Transfer Protocol, Basic File and Directory Handling, Transferring Files, Anonymous FTP, Cryptography Basics, Symmetric Key Algorithms, Asymmetric Key Algorithms,

Unit-IV**12L**

SSH: The Secure Shell, Host Authentication, The rhosts/shosts Authentication Scheme, User Authentication with Symmetric Algorithms, Using the SSH Agent for Noninteractive Logins, The SSH Tools, Remote Login and Command Execution (**ssh** and **slogin**, File Transfer with **sftp** and **scp**, Internet Mail, ~/.signature and ~/.forward: Two Important Files, MIME: Handling Binary Attachments in Mail, Using X Window on a TCP/IP Network, The Display, Using the DISPLAY variable, Using the -display Option, HTTP and the World Wide Web, The Uniform Resource Locator (URL), HTTP: The Protocol of the Web, Running External Programs

Text Book

1. Your UNIX/Linux The Ultimate Guide by Sumitabha Das

Reference Book

1. Unix programming guide by Steven Patra.
2. Learning the bash Shell by Cameron Newham.
3. The Unix Programming Environment by Brian Kernighan and Rob Pike.
4. The Art of Unix Programming by Eric S. Raymond.



Course: B. Voc. in ITSSD **Semester - V** **3 - Credits**
Paper Title:- Basic of Android Operating System **Paper No. 33: SC1505T**

Units:- I **11L**

Environment Setup:

Setup Java Development Kit (JDK), Android SDK, Eclipse IDE, Android Development Tools (ADT) Plugin, Create Android Virtual Device, Architecture: Linux kernel, Libraries, Android Runtime, Application Framework.

Application Components:

Application Components Activities, Services, Broadcast Receivers, Content Providers, Additional Components, Create Android Application, Anatomy of Android Application, The Main Activity File, The Manifest File, The Strings File, The R File, The Layout File, Running the Application.

Units:- II **11L**

Resources Organizing & Accessing: Alternative Resources, Accessing, Resources.

Intents and Filters: Intent Objects, Action, Android Intent Standard Actions, Data, Category, Extras, Flags, Component Name, Types of Intents: Explicit Intents, Implicit Intents.

Units:- III **11L**

UI Layouts

Android Layout Types, Relative Layout Attributes, Grid View Attributes, Sub-Activity, Layout Attributes, View Identification, UI Controls, Android UI Controls, TextView Attributes, AutoComplete Text View Attributes, Button Attributes, ImageButton Attributes, CheckBox Attributes, ToggleButton Attributes, RadioButton Attributes, RadioGroup Attributes.

Units:- IV **12L**

Event Handling:

Event Listeners & Event Handlers, Event Listeners Registration, Styles, and Themes, Defining Styles, Using Styles, Style Inheritance, Android Themes, Default Styles & Themes, Custom Components, Creating a Simple Custom Components.

Reference Books :

1. Professional Android 4 Application Development :Reto Meier, Wrox publication.
2. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. (2011)
3. Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd
4. Android Application Development All in one for Dummies by Barry Burd, Edition: I

Web Reference

1. Android Tutorial, Simply Easy Learning by tutorialspoint.com.
2. http://www.tutorialspoint.com/android/android_tutorial.pdf



Course: B. Voc. in ITSSD

Semester - V

4 - Credits

Paper Title:- Practical on Unix Programming

Paper No. 34: SC1506P

Following is list of some sample practical, faculty can add other practical.

- 1) Write a shell script that accept a file name starting and ending line numbers as arguments and display all the lines between given line no:
- 2) Write a shell script that delete all lines containing a specified word
- 3) Write a shell script that displays a list of all the files in the current directory
- 4) Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. whenever the argument is a file or directory.
- 5) Write a shell script that accept a list of file names as arguments count and report the occurrence of each word.
- 6) Write a shell script to find the factorial of given integer
- 7) Write a shell script that list the all files in a directory.
- 8) Write an awk script to find the number of characters, words and lines in a file?
- 9) Write a C Program that makes a copy of a file using standard I/O and system calls?
- 10) Implement in C the following Unix commands using system calls A) cat B) mv

Course: B. Voc. in ITSSD

Semester - V

4 - Credits

Paper Title:- Practical on Android operating System

Paper No. 35: SC1507P

Following is list of some sample practical, faculty can add other practical.

- 1) Compare various operating systems with Android OS, Install and configure java development kit (JDK), android studio and android SDK. Configure android development tools (ADT) plug-in and create android virtual device
- 2) Develop a program to display Hello World on screen.
- 3) Develop a program to implement linear layout and absolute layout.
- 4) Develop a program to implement frame layout, table layout and relative layout.
- 5) Develop a program to implement Text View, Edit Text and Auto Complete Text View.
- 6) Develop a program to implement Button, Image Button and Toggle Button.
- 7) Develop a program to implement login window using above UI controls.
- 8) Develop a program to implement Checkbox, Radio Button and Radio Group.
- 9) Develop a program to implement Progress Bar.
- 10) Develop a program to implement List View, Grid View, Image View and Scroll View.



Course: B. Voc. in ITSSD
Paper Title:- Mini Project

Semester - V

6 - Credits
Paper No. 35: SC3508P

Designing and development of an android App which covers all aspects of SDLC

The Project Report should contain all SDLC phases viz.

1. Analysis
2. Designing
3. Coding
4. Testing
5. Implementation

Some sample Applications are given bellow

- 1) Create sample application with login module. (Check username and password) On successful login, Change TextView "Login Successful" . And on login fail, alert user using Toast "Login fail".
- 2) Create login application where you will have to validate username and password till the username and password is not validated, login button should remain disabled.
- 3) Develop a program to a) Send SMS b) Receive SMS
- 4) Develop a program to send and receive e-mail.
- 5) Deploy map-based application.





B. Voc. Third Year
(IT Skills and Software Development)
Semester - VI

Course : B. Voc. in ITSSD
Paper Title: Data Science

Semester-VI

4-Credits
Paper No. 36: GC601T

Unit –I

15L

Practical statistics for data science. Exploratory data analysis, elements of structured data. Key terms of data types. Rectangular data, Key terms for Rectangular data, data frames and indexes. Nonrectangular data structures. Graphs in statistic. Estimates of location. Matrices of estimates. Mean, Median and robust estimates, Outliers. Examples.

Unit- II

15L

Data Analytic Thinking, The Ubiquity of data analysis, examples, Data Science Engineering and data driven decision making system. Data processing and big data, from big data 1.0 to big data 2.0. Data and data science capabilities as a strategic asset. Data Analytic Thinking, The need for management with analytical skills, data science versus the work of the data scientists.

Unit-III

15L

Business Problems and data Science. Fundamental concepts, from business problems to data mining tasks. Classification, Regression, Similarity matching, Clustering, co-occurrence grouping or frequent item set mapping, Profiling, Link prediction, Data reduction, Casual modeling. Supervised vs. unsupervised methods.

Unit-IV

15L

Data mining and its results. The data mining process. Business understanding, data understanding, data preparation, modeling, evaluation, deployment. Implications for mining the data science team. Other analytical techniques and technologies. Statistics, database querying, data warehousing, regression analysis, Machine learning and data mining. Answering business questions with these techniques.

Reference Books:-

1. Practical Statistics for Data Scientists: 50+ Essential Concepts Using R and Python by Andrew Bruce, Peter C. Bruce, and Peter Gedeck, O'Reilly publications
2. Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking Book by Tom Fawcett,
3. Doing Data Science: Straight Talk from the Frontline, by Cathy O'Neil and Rachel Schutt

Course : B. Voc. in ITSSD Semester-VI
Paper Title: Human Resource Management

4-Credits
Paper No. 37: GC602T

Unit I

15L

Introduction to Human Resource Management - Concept, Nature, Scope, Significance, Objectives and Functions of HRM.

Unit II

15L

Human Resource Planning (HRP) - Meaning and need for Human resource Planning - Process of HRP - Factors affecting HRP. -Job Analysis -Recruitment and selection – Meaning, - Sources of recruitment

Unit III

15L

Employee Training - Meaning and need for training - Steps in training - Methods of Training – Impediments of effective training

Unit IV

15L

Performance Appraisal and Merit Rating - Meaning and purpose of performance appraisal - Methods of performance appraisal - Ethics in performance appraisal – Merit Rating – Meaning, Benefits of Merit Rating – Difference between performance appraisal and merit rating

Books Recommended: -

1. Principles of Personnel Management — by Edwin B Philpo
2. Management of Organization Behaviour — by Paul Harsey K. Blanchard
3. Personnel/Human Resource Management __ Decenza & David
4. Human Resource Management- P.Subbarao
5. Human Resource Management: R.S.Triwedi
6. Human Resource Management — by C.V. Subramaniam
7. K Ashwathappa : Human Resource Management, Tata McGraw Hill, New Delhi



Course : B. Voc. in ITSSD
Paper Title: Principles of Marketing

Semester-VI

4-Credits
Paper No. 38: GC603T

Unit I

15L

What is AI?, Why to learn AI?, Goals Of AI, What contributes AI?, Advantages and disadvantages. Applications of AI, History of AI.

Unit II

15L

Types of AI, AI agents, types of AI agents, AI agent environments, Nature or types of AI agent environment. Search algorithms, search algorithm terminologies, properties of search algorithms, types of search algorithms.

Unit III

15L

Subsets of AI, Machine Learning, Deep Learning, Natural Language processing, Expert System, Robotics, Machine Vision, Speech Recognition, Expert systems definition, examples, characteristics of expert systems, components of expert systems, development of expert systems, participants, need of expert systems, capabilities, advantages and disadvantages and applications.

Unit IV

15L

Natural language Processing(NLP), what is NLP?, history of NLP, advantages, disadvantages, components, applications of NLP, Phases of NLP, NLP libraries, difference between computer language and natural language.

Reference Books Recommended

1. Principles of Artificial *Intelligence* by Nils Nilsson
2. Introduction to Artificial Intelligence and Expert systems-Dan Patterson.
3. Artificial Intelligence: A Modern Approach Textbook by Peter Norvig and Stuart J. Russell



Course: B. Voc. in ITSSD
Paper Title:- Industrial Internship

Semester - VI

10 - Credits
Paper No. 39: SC1604P

Before start of the Semester VI, student should work in an IT or IT enabled industry for minimum 4 weeks and have hands on experience on software development/Networking/ERP/Hardware maintenance etc. After completion of the internship student should submit internship completion certificate on the letter head of the concern firm. Student should submit a report regarding the internship for the university examination. The internal marks for the same will be given by the firm. In the university prescribed format.

Course: B. Voc. in ITSSD
Paper Title:- Project Work and Report

Semester - VI

6 - Credits
Paper No. 39: SC1605P

A project should be developed by the student to cater the need of that industry.

It is a group activity and the group size will be decided by the project guide on the basis of the project size.

Student can choose any programming language to develop the project.

The Project Report should contain all SDLC phases viz.

1. Analysis
2. Designing
3. Coding
4. Testing
5. Implementation

The Project review should be carried out after every 15 days

Project Review 1

Project Review 2

Project Review 3

Course: B. Voc. in ITSSD
Paper Title:- Seminar

Semester - VI

2 - Credits
Paper No. 40: SC1606P

Student should select any current topic related to Computer Science or IT.

It is an individual activity each student should select unique topic in the batch.

In the final examination he/she should deliver a seminar of minimum 13 mins, which will be followed by question answer session.

Student should submit a seminar report.

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11/11/21