Structure/ Pattern of Syllabus must be as follows:

1) Title of the Course: **Computer Hardware and Network Administration**
(Vocational)

2) Introduction: **Pattern Semester**

3) Eligibility: **Should have offered Computer Hardware and Network Administration(Vocational) at**
S.Y.B.Sc. and passed as per Pune University Rules

4) Examination
A) Pattern of examination: **Semester**
i) **40:10** (University Semester examination of 40 Marks & Internal assessment of 10 Marks) Details
      as per the syllabus
ii) Pattern of the question paper: **As per the specimen given**
B) Standard of Passing : **As per Pune University norms**
C) ATKT Rules : **As per Pune University norms**
D) Award of Class : **As per Pune University norms**
E) External Students : **Not permitted**
F) Setting of Question paper/ Pattern of Question paper: **As per Pune University norms**
G) Verification of Revaluation : **As per Pune University norms**

5) **Structure of the Course :**
i) Optional
ii) Medium of instruction : **English**

6) Equivalence subject/ papers & Transitory Provision: **Computer Hardware Maintenance**
(Vocational)

7) University terms : **As per Pune University Norms.**

8) Subject wise Detail Syllabus : **Attached**

9) Recommended books : **Mentioned in syllabus**

T.Y.B.Sc Vocational Computer Hardware & Network Administration

Semester -III: Paper-V

Network Concepts I

Objective: The Course shall introduce the Networking Concepts and its use in the Information Technology industry. It also elaborates on the protection and security aspects.

Unit1: Networking Fundamentals
- Basics of Networks:- Definition, Need, Applications
- Network Topologies
o BUS,STAR,MESH,Hybrid: Definition, Advantages & Disadvantages, Applications
- OSI Reference Model: Diagram, Working & Significance of Each Layer.
- Protocol Basics: Definition, Types of Protocols, Usage of Various Protocols & Port nos :
 TCP/IP,NetBeui,VPN,SNMP,FTP/SMTP/POP/HTTP,SSL/TSL
- Arcnet, Ethernet, MAN, SAN, NAS, Virtual LANs, ATM's:- Definition, Need, Significance, Application
- Networking Components (Hardware): Cables & Connectors (Coaxial, UTP/STP, Fiber Optics, Cat(x) Cables), Switches (Unmanaged, Smart Web Managed, Full Managed), Hardware/Software Firewall, Study of UTM, Wireless Routers DSL/ADSL – Latest Examples and Usage
Advances in Network Applications: Mobile as a Network Client, Types & Application of CCTV Network, Types and Application of Access Control Devices.

Unit 2: Classification of Servers – Latest Versions with Examples and Applications
- Concept of Client Server Technology- Definition, Need, Significance, Application
- Application Server- Definition, Need, Significance, Application
- File/Storage / Print Server- Definition, Need, Significance, Application
- Mail / Web Servers- Definition, Need, Significance, Application
- Data Base Server (Oracle /SQL) Definition, Need, Significance, Application
- Network Video Recorder (NVR) Ser ver- Video Surveillance Store

Unit3: Server Operating Systems
- Introduction to Network Operating Systems
- Functions of Network Operating System
- Concepts of Thick Servers and Thin Clients, RDP Devices
- Microsoft Network Operating Systems
- Linux Operating Systems, Android OS and its Flavors, IOS, Win8 for Mobile
- DNS,WINS, DHCP, Concepts
- User and Group Management Concepts

Books for References: (All Latest Versions)
1. Cisco Certified Network Associate – BPB Publication
2. Upgrading and Trouble Shooting of Networks by Zackers
3. Linux Bible (Any Publication)
4. Mastering Windows 2003 Server by Minasi
5. Computer Networks by Tanen Baum
6. Network Hand Book by Taylor
7. Computer Network Protocols, Stds, & Interfaces
8. Firewalls – A Complete Guide by Black

9. Firewall & Internet Security by Cheswick Bellovin
10. Network + Certification by Microsoft Press
11. Upgrading & Repairing PC's by Scott Muller

T.Y.B.Sc Vocational Computer Hardware & Network Administration
Semester -III: Paper-VI
Computer Service Management

Objective: This course shall build a platform for students to get prepared to either start
their own enterprise, Seek Jobs in emerging BPO/IT Support Sector. It imparts
Functional IT knowledge to the students.

Unit 1: Information Security Management – *Consider latest Practices in the Industry*
- Information System Organizational Structure- Need of it, Importance, Hierarchy
- Roles and Responsibilities of Computer Users: System Administrator, Database Administrator, Network
Administrator, Data Entry Operator, Programmer, System Analyst, Security Administrator, CIO, CEO etc.
- Segregation of Duties and Control Matrix for Computer Users: Need, Importance, Application
- Access Controls: Physical- Thumb Reader, Card Reader, Locked Doors etc. Logical- Passwords, OTP, Captcha etc
- Social Engineering Concepts: Defination, Example, Application & Use, Threats
- Study of Different ISO Standards & COBIT Frame Work: Features, Advantages, Applications
- IS Audit Functions:- Definition, Need, Significance

Unit2: IT Service Delivery & Support - *Consider latest Practices in the Industry*
- Hardware & Software Acquisition
o Study of Requirements: Need of User, Hardware, Software & Infrastructure Requirements,
o Cost Based Analysis & Planning of the Requirements
o Preparing of Request for Proposal (RFP)/Invitation to Tender (ITT)
o Testing & Implementation of the IT Infrastructure for Use Before Delivery- Need, Significance, Process
- Implementation of Support / Help Desk
o Help Desk: Definition, Need, Significance, Working
o Help Desk Resource Allocation: Need, Significance, Process of Allocation
o Problem Escalation: Definition, Need, Significance, Role of Principle Vendor

Unit3: Computer /Information Systems Maintenance Practices - *Consider latest Practices in the Industry*
- Service Level Agreement: Definition, Need, Significance, Adherence
- Incidence /Problem Management: Definition, Process to Handle, Benefits, Process Owners
- Change Management Process- Definition, Process to Handle, Benefits, Process Owners
- Hardware Monitoring Procedures: Need, Significance, Benefits.
- Software Licensing Issues: Ownership, License Limitations, Issuing Authority, Legal Repercussion, Freeware, Shareware

Reference Books and Websites:
1. http://www.itil.org
2. http://www.isaca.org/cisa
3. Information Systems: Control & Audit by Ron Weber, Published by: Pearson
4. CISA Certified Information Systems Auditor All-in-One Exam Guide, 2nd Edition by Peter Gregory. Published
by: McGraw Hill Education (India)

Semester –IV Paper-V

Network Concepts - II

Unit1: Network Threats & Protection
- Types of Internet Attacks:
o Passive Attacks: Their Definition, Significance, Impacts, Threats, Preventions
   Types of passive Attacks: Network Analysis, Eavesdropping,Traffic Analysis
Active Attacks: Their Definition, Significance, Impacts, Threats, Preventions
Types of active Attacks: Brute-Force Attacks, Masquerading, Phishing, Denial of Service Attacks, Email Bombing & Spamming, Email Spoofing
- Network Data Protection Measures: Its Definitions, Need, Significance, Benefits, Threats
   o   Physical Access
   o   Logical Access
   o   Firewalls/Antivirus/IDS/IPS
   o   Data Encryption –Cryptographic Methods.
   o   Concepts of Cold Sites, Warm Sites, Hot sites, Mirroring
-Threats Caused by New Devices: Smart Phones, Tablets, Android (Open Source) O.S

Unit 2: Network Configuration Management & Monitoring
- Network Planning
o Environmental Study & Site Requirement: Need, Significance & Benefits
o Resource Planning: Hardware, Software & Personnel: Need, Significance & Benefits
- Configuration of Peer to Peer Network using Windows 8.x
o Installation of Windows 7/8.1 Operating System, Configuring Ethernet Driver, Configuring TCP/IP Protocol, Configuring File Sharing & Printing Protocol, Sharing a Drive on Network, Sharing a printer on Network
-**Network Attached Storage(NAS)- Concept, Study of Various NAS Devices, Study of its Features, NAS as Cloud Storage. Assign Access Right Definitions while Sharing.**
- Configuration of Broad Band/Dial Up Internet Connection on the PC
o Installation & Study of latest Wireless Router, Access Point Devices
o Configuration of Gateways, TCP/IP/DNS settings
o Use of Proxy Server for Internet Sharing.

Unit3: Advanced Networking Concepts
- **Firewall- Concept, Hardware & Software Firewall, IPS devices, Study of Various Firewall Devices.**
- Study of Latest UTM Devices available .
- Study of Managed Switches such as Layer 2, Layer 3 and Smart Switches.
-Basics of VOIP
- Basics of VPN
o Remote Access VPN
o Intranet Access VPN and Extranet Access VPN
o Basics of VLANS
Books for References: (All Latest Versions)
1. Cisco Certified Network Associate – BPB Publication

2. Upgrading and Trouble Shooting of Networks by Zackers
3. Linux Bible (Any Publication)
4. Mastering Windows 2003 Server by Minasi
5. Computer Networks by Tanen Baum
6. Network Hand Book by Taylor
7. Computer Network Protocols, Stds, & Interfaces
8. Firewalls – A Complete Guide by Black
9. Firewall & Internet Security by Cheswick Bellovin
10. Network + Certification by Microsoft Press
11. Upgrading & Repairing PC's by Scott Muller

T.Y.B.Sc Vocational Computer Hardware & Network Administration

Semester IV: Paper VI

Entrepreneurship Development

Entrepreneurship is a tremendous force that can have a big impact in growth, recovery, and societal progress by fuelling innovation, employment generation and social empowerment.

Through entrepreneurship education, young people, including those with disabilities, learn organizational skills, including time management, leadership development and interpersonal skills, all of which are highly transferable skills sought by employers.

The syllabus for T.Y.B.Sc., Vocational students thus is aimed at creating an awareness amongst the students about the benefits of becoming an entrepreneur and at the same time equip them with information about a good and a viable opportunity; making a business plan by assessing the techno-economic feasibility, seeking financial assistance, variety of procedures and formalities for setting up an Small Scale enterprise, taking decisions in such a manner so that entrepreneurship becomes a life time career goal.

OBJECTIVES:
- To create awareness about self-employment and motivate the students to go for self-employment.
- To study entrepreneurship concepts and their applicability.
- To familiarize the students to the practical world of enterprise/business.

1. INTRODUCTION:
Concept of entrepreneurship, Historical background, need and scope of entrepreneurship in modern society, Entrepreneurial behavior, attributes and skills.
Key elements of entrepreneur, Entrepreneurial process, Entrepreneurial culture,
Environment of Entrepreneurship, Socio economic origins of Entrepreneurship,
Barriers of Entrepreneurship and means to reduce those, types of Entrepreneurs, Characteristics of Entrepreneur.   8 Lectures

2. BUSINESS ORGANIZATIONS:
Forms of business organizations such as sole proprietorship, partnership, Joint Stock Company, cooperative organization etc.
Meaning and definition , Relative merits and demerits of each form, ,

Types of Small Scale Industry.
3 Lectures

3. Study of organizations promoting Entrepreneurship

Sources of Information: Where to go for what?
    a) District Industry Centre (DIC)
    b) Maharashtra Industrial Development Corporation (MIDC)
    c) Maharashtra State Small Industries Development Corporation (MSSI DC)
    d) Small Industries Services Institute (SISI)
    e) National Institutes of Entrepreneurship and Small business Development (NIESBUD)
    f) National Entrepreneurship Development Board (12) (NEDB)
    g) Entrepreneurship Development Institute of India
    h) Commercial and Co-operative Banks
    i) State Industrial Development Bank (SIDBI)
    j) Pollution Control Board   3 Lectures

Legal Aspects of Small Business:
Elementary knowledge of Income Tax, Sales Tax, VAT, Service Tax, Patent Rules, Excise Rules, Factory Act and Payment of Wages Act**,** TDS act Procedures for registration of SSI, TDS no, PAN no.
                                                                       2 Lectures

3. ENTREPRENEURSHIP DEVELOPMENT:
Identification of opportunities for entrepreneurship, ideas to start new business, criteria for selection of new product or service, Market Survey as a tool, Technical and economic feasibility of a project, Role of consultancy organizations.   8 Lectures

Project formulation and project report preparation (Use guidelines given in Schedule II)
                                                                       4 Lectures

4. FINANCIAL ASPECTS:
 Govt/Public sources of finance
Sources of finance, Role of various funding agencies, government and commercial Role of various funding corporations and funding institutes such as chamber of commerce, MSFC, MCED, NSSIDC, Banks, special institutes such as IDBI,MIDC,SICOM etc, Working capital, cash flow, fund flow, study of basic financial statements, costing and pricing, breakeven point, SWOT analysis.

Private Sources
    1. Equity –Angel finance , Venture capital
    2. Debt Finance – Loans from banks loan against co-lateral security, PMYR-Loans with subsidy from Central GOVT, State Govt , CGTSME(Central Grant For Small Medium Enterprise)

                                                                       8 Lectures

5. MARKETING ASPECTS:
Meaning, scope and importance, Marketing strategy, Market segmentation, marketing channels.
Marketing mix and its effect.
Digital marketing through Web browsing, Face book , Google search engines SMS campaigns , Mailers , Hand bills etc   6 Lectures

6. HUMAN RESOURCE ASPECTS: (H.R Policies)

Concept and scope in modern industry,
Different modes of employment, Placement of proper person for a job, Interpersonal relations and communication skills, training of personnel, guidance for stress management, soft skills.
Drafting -Appointment letter, termination tenure , experience certificates , exit policies
Legal liabilities of employees, Group insurance for factory workers, understanding WAC (Workers Accident Compensation)

<div align="right">6 Lectures</div>

Practicals/ Assignments

The practicals to be conducted are with an objective to transform the knowledge gained by the students in their classes to real life experience. These practicals will be based on the vocational subject and the Principal subject a student has offered

Internal assessment should carried out on the practicals/ assignments done by a student

Sr. No.	Title of Practical	Objective	Mode
1.	Role of District industry centre	Understand the working of District industry centre	Visit and report submission
2.	Visit to a small scale Industry	To understand plant location and plant layout and to submit a report on the guidelines given in **schedule I**	Visit and report submission
3.	Visit to a service unit	To study the legal aspects of a service unit and to submit a report	Visit and report submission
4.	Entrepreneurial ideas	Describe in brief two entrepreneurial ideas of yours	Home assignment
5.	Project formulation	Prepare a preliminary document about an enterprise you want to start It should contain executive summary, customer/target market analysis and strategy (use guidelines given in **schedule II**)	Home assignment
6.	Review business plans For this Plans should be exchanged with other teams	Submit a **review** of a business plan of **other team**. It should include critical and constructive comments	Home assignment
7.	Drafting a business plan	It should contain executive summary, customer/target market analysis and strategy, marketing and operations, risks, management team and financial projections	Power Point Presentation

RECOMMENDED BOOKS
Text book
1. Dynamics of Entrepreneurial Development and Management – Shri. Vasant Desai.(Latest edition)

Reference books (Latest Editions)
1. Environment & Entrepreneur: Mr.B.C.Tondon

2. Business Environment: Dr.G.V.Kayande Patil
3. Udyogvardhini –MCED
4. Basic Communication Skills: By P. Kiranmai Dutt & Geetha Rajeevan, 2000
5. Fundamentals of Office Management: By J.P. Mahajan , Office Management – By S. P. Arrora, latest edition
6. A guide to small Scale Entrepreneurs, Director of Industries, Govt. of Tamil Nadu Chennai, latest edition
7. Entrepreneurship and small Business Management- Dr. C. B. Gupta & Dr. Khanna
8. Project Management- K. Nagarajan
9. 100 project Reports Yashwantrao Chavan Open Universiy (YCMOU) Edition
10. Entrepreneurship Ideas in Action Cynthia L. Greene (YCMOU) Edition

Schedule-I

Visit to a small scale Industry

1	Year of commencement of the project	
2	Work experience of the entrepreneur before staring the project	
3	Detailed information of the product	
4	Type of customers using their product	
5	Pricing details of all the product range	
6	No. of workers/ Staff working in the Unit	
7	Turnover in the last three years	
8	Mode of Advt/Marketing adapted for promoting the Products	
9	Investment done at the time of starting the project	

Schedule II

Project formulation

1	Product /services Selected its justification	
2	Capital investment required to start the Services /Product	
3	Minimum Infrastructure requirement	
4	Rent as per current rates for the same premises/ Office /Factory	
5	Various Competitors currently for the same product /Services	
6	Your unique selling proposition USP ie write down why your product will be preferred by the customer as against the present competition. 1) Features 2) Cost 3) Geographic location 4) service 5)durability	
7	Marketing Strategy used for Advertising your product	
8	Various digital marketing methods to be selected	
9	What will be your ROI(Return On Investment)	
10	What will be your Break even point	
11	How will you be raising the finance for the same	
12	Prepare a three years Balance sheet, / P/L statement taking help from a Third year commerce stream student.(optional)	

T.Y.B.Sc Vocational Computer Hardware & Network Administration

Paper-III: Practical Course

Objective: Give hands on training to the students and make them acquainted with various Real time Applications implemented currently in the Industry.

List of Practicals:
1. Installation of Operating System – Win7/8.1/ Win2012 Server / Linux Latest Ver.
2. Configuration of Antivirus Software as a FireWall. (Configure Parenting Controls)
3. Study of Brute Force Attack Method using Free Tools.
4. Using PGP Software – Demonstrate Cryptography
5. Configure a Broadband Router as a Firewall
6. Study of Layer2/Layer3/Smartswitch to create a Virtual LAN.
7. Install analog Proxy and Demonstrate Internet Sharing
8. Prepare a Straight & Cross Patch Chord using Cat5 Cable & RJ45 jacks.
9. Install a Wireless Router and Configure it as a Wireless Access Point.
10. Using SIW software find out the Installed Applications on PC
11. Prepare a RPF/ITT proposal for Hardware & Software acquisition
Assignments based on Entrepreneurship Development are given separately