EXCELSSIOR EDUCATION SOCIETY'S

# K. C. College of Engineering & Management Studies & Research

Mith Bunder Road, Kopri, Thane (E)

## Cycle – 2 NAAC Accreditation 2024

# Criteria 1: - Curricular Planning & Implementation

**1.3.1 Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability intransacting the Curriculum.**

*Submitted to*

National Assessment and Accreditation Council

1.3.1 Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability in transacting the Curriculum

| Sr. No. | Department | Number of courses integrate Professional Ethics | Number of courses integrate Gender issues | Number of courses integrate Human Values | Number of courses integrate Environment and Sustainability | Total |
|---|---|---|---|---|---|---|
| 1 | MMS | 1 Business Research Method<br>2. Competency Based HRM<br>3. Supply Chain Management<br>4. Material Management | - | 1. Perspective Management | - | 5 |
| 2 | IT / Computer Engineering | 1. Computer Network Security<br>2. Security Lab<br>3. Entrepreneurship and E-business<br>4. Ethical Hacking and Forensics<br>5. Major Project – I<br>6. Mini Project – 2 B Web Based on ML<br>7. Professional Communication & Ethics-II (PCE-II)<br>8. Mini Project – 2 A Web Based Business Model<br>9. Product Life Cycle Management<br>10 . Secure Application Development<br>11. Software Engineering<br>12. Mini Project – 1 A for Front end /backend Application<br>using JAVA | 1. Entrepreneurship and E-business | - | 1. Green IT | 14 |
| 3 | EXTC | 1. Professional Communication & Ethics - II<br>2. Cyber Security and Laws | - | - | 1. Environmental Management | 3 |
| TOTAL | | 18 | 1 | 1 | 2 | 22 |

**TOTAL = 22**

K.C. College of Engg. and Management Studies and Research THANE (E)

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering &
Management Studies & Research.

1.3.1

EXCELSSIOR EDUCATION SOCIETY'S
K. C. College of Engineering & Management Studies & Research
Mith Bunder Road, Kopri, Thane (E)

# 1.Courses integrate Professional Ethics

| Course Code | Course Name | Teaching scheme | | | Credit assigned | | | |
|---|---|---|---|---|---|---|---|---|
| | | Theory | Pract. | Tut. | Theory | Pract. | Tut. | Total |
| ECL504 | Professional Communication & Ethics-II | -- | 2*+ 2 Hours (Batch-wise) | -- | -- | 2 | -- | 02 |

*Theory class to be conducted for full class.

| Course Code | Course Name | Examination Scheme | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Theory | | | | | Term work | Pract | Oral | Internal Oral | Total |
| | | Internal Assessment | | | End sem | Duration (hrs) | | | | | |
| | | Test 1 | Test 2 | Avg. | | | | | | | |
| ECL504 | Professional Communication & Ethics-II (abbreviated PCE-II) | -- | -- | -- | -- | -- | 25 | -- | -- | 25 | 50 |

| Course Code | Course Name | Credits |
|---|---|---|
| ECL504 | Business Communication & Ethics | 02 |
| Course Rationale | This curriculum is designed to build up a professional and ethical approach, effective oral and written communication with enhanced soft skills. Through practical sessions, it augments student's interactive competence and confidence to respond appropriately and creatively to the implied challenges of the global Industrial and Corporate requirements. It further inculcates the social responsibility of engineers as technical citizens. | |
| Course Objectives | • To discern and develop an effective style of writing important technical/business documents.<br>• To investigate possible resources and plan a successful job campaign.<br>• To understand the dynamics of professional communication in the form of group discussions, meetings, etc. required for career enhancement.<br>• To develop creative and impactful presentation skills.<br>• To analyze personal traits, interests, values, aptitudes and skills.<br>• To understand the importance of integrity and develop a personal code of ethics. | |

K.C. College of Engg. and Management Studies and Research (Regd.) THANE

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| Course Code | Course Name | Teaching Scheme (Contact Hours) | | | Credits Assigned | | | |
|---|---|---|---|---|---|---|---|---|
| | | Theory | Practical | Tutorial | Theory | Practical | Tutorial | Total |
| ILO 7016 | Cyber Security and Laws | 03 | -- | -- | 03 | -- | -- | 03 |

| Course Code | Course Name | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Theory Marks | | | | Exam Duration (Hrs.) | Term Work | Practical and Oral | Total |
| | | Internal Assessment | | | End Sem. Exam. | | | | |
| | | Test1 | Test2 | Avg. | | | | | |
| ILO 7016 | Cyber Security and Laws | 20 | 20 | 20 | 80 | 03 | -- | -- | 100 |

**Objectives:**

1. To understand and identify different types cybercrime and cyber law
2. To recognized Indian IT Act 2008 and its latest amendments
3. To learn various types of security standards compliances

**Outcomes:** Learner will be able to…

1. Understand the concept of cybercrime and its effect on outside world
2. Interpret and apply IT law in various legal issues
3. Distinguish different aspects of cyber law
4. Apply Information Security Standards compliance during software design and development

| Module | Detailed Contents | Hrs |
|---|---|---|
| 01 | **Introduction to Cybercrime:** Cybercrime definition and origins of the world, Cybercrime and information security, Classifications of cybercrime, Cybercrime and the Indian ITA 2000, A global Perspective on cybercrimes. | 4 |
| 02 | **Cyber offenses & Cybercrime:** How criminal plan the attacks, Social Engg, Cyber stalking, Cyber café and Cybercrimes, Botnets, Attack vector, Cloud computing, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication Service Security, Attacks on Mobile/Cell Phones, Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile, Devices-Related Security Issues, Organizational Security Policies and Measures in Mobile Computing Era, Laptops | 9 |
| 03 | **Tools and Methods Used in Cyberline**<br>Phishing, Password Cracking, Keyloggers and Spywares, Virus and Worms, Steganography, DoS and DDoS Attacks, SQL Injection, Buffer Over Flow, Attacks on Wireless Networks, Phishing, Identity Theft (ID Theft) | 6 |
| 04 | **The Concept of Cyberspace**<br>E-Commerce , The Contract Aspects in Cyber Law ,The Security Aspect of Cyber Law ,The Intellectual Property Aspect in Cyber Law , The Evidence Aspect in Cyber Law , The Criminal Aspect in Cyber Law, Global Trends in Cyber Law , Legal Framework for Electronic Data Interchange Law Relating to Electronic Banking , The Need for an Indian Cyber Law | 8 |
| 05 | **Indian IT Act.** | 6 |

K.C. College of Engg. and Management Studies & Research THANE

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| | | |
|---|---|---|
| | Cyber Crime and Criminal Justice : Penalties, Adjudication and Appeals Under the IT Act, 2000, IT Act. 2008 and its Amendments | |
| 06 | **Information Security Standard compliances**<br>SOX, GLBA, HIPAA, ISO, FISMA, NERC, PCI. | 6 |
| | **Total** | 39 |

## Assessment:

**Internal:**
Assessment consists of two tests out of which; one should be compulsory class test and the other is either a class test or assignment on live problems or course project.

**End Semester Theory Examination:**
Some guidelines for setting up the question paper. Minimum 80% syllabus should be covered in question papers of end semester examination.

**In question paper weightage of each module will be proportional to number of respective lecture hours as mention in the syllabus.**

1. Question paper will comprise of total six question
2. All question carry equal marks
3. Questions will be mixed in nature (for example supposed Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3)
4. Only Four question need to be solved.

**REFERENCES:**


1. Nina Godbole, Sunit Belapure, *Cyber Security*, Wiley India, New Delhi
2. The Indian Cyber Law by Suresh T. Vishwanathan; Bharat Law House New Delhi
3. The Information technology Act, 2000; Bare Act- Professional Book Publishers, New Delhi.
4. Cyber Law & Cyber Crimes By Advocate Prashant Mali; Snow White Publications, Mumbai
5. Nina Godbole, *Information Systems Security,* Wiley India, New Delhi
6. Kennetch J. Knapp, *Cyber Security & Global Information Assurance* Information Science Publishing.
7. William Stallings, *Cryptography and Network Security,* Pearson Publication
8. Websites for more information is available on : The Information Technology ACT, 2008- TIFR : https://www.tifrh.res.in
9. Website for more information , A Compliance Primer for IT professional : https://www.sans.org/reading-room/whitepapers/compliance/compliance-primer-professionals-33538


K.C. College of Engg. and Management Studies and Research ★ THANE (E)

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering &
Management Studies & Research.

| Course Code | Course Name | Teaching Scheme (Contact Hours) | | Credits Assigned | | |
|---|---|---|---|---|---|---|
| | | Theory | Practical | Theory | Practical | Total |
| ITC502 | Computer Network Security | 03 | -- | 03 | -- | 03 |

| Course Code | Course Name | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Theory | | | | | Term Work | Pract / Oral | Total |
| | | Internal Assessment | | | End Sem Exam | Exam Duration (in Hrs) | | | |
| | | Test1 | Test2 | Avg. | | | | | |
| ITC502 | Computer Network Security | 20 | 20 | 20 | 80 | 03 | -- | -- | 100 |

**Course Objectives:**

| Sr. No. | Course Objectives |
|---|---|
| The course aims: | |
| 1 | The basic concepts of computer and Network Security |
| 2 | Various cryptographic algorithms including secret key management and different authentication techniques. |
| 3 | Different types of malicious Software and its effect on the security. |
| 4 | Various secure communication standards including IPsec, SSL/TLS and email. |
| 5 | The Network management Security and Network Access Control techniques in Computer Security. |
| 6 | Different attacks on networks and infer the use of firewalls and security protocols. |

**Course Outcomes:**

| Sr. No. | Course Outcomes | Cognitive levels of attainment as per Bloom's Taxonomy |
|---|---|---|
| On successful completion, of course, learner/student will be able to: | | |
| 1 | Explain the fundamentals concepts of computer security and network security. | L1, L2 |
| 2 | Identify the basic cryptographic techniques using classical and block encryption methods. | L1 |
| 3 | Study and describe the system security malicious software. | L1, L2 |
| 4 | Describe the Network layer security, Transport layer security and application layer security. | L1, L2 |
| 5 | Explain the need of network management security and illustrate the need for NAC. | L1, L2 |
| 6 | Identify the function of an IDS and firewall for the system security. | L1, L2, L3 |

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies and Research

**Prerequisite:** Basic concepts of Computer Networks & Network Design, Operating System

**DETAILED SYLLABUS:**

| Sr. No. | Module | Detailed Content | Hours | CO Mapping |
|---|---|---|---|---|
| 0 | Prerequisite | Basic concepts of Computer Networks & Network Design, Operating System | **02** | -- |
| I | Introduction to Network Security & cryptography | Computer security and Network Security(Definition), CIA, Services, Mechanisms and attacks, The OSI security architecture, Network security model. Classical Encryption techniques (mono-alphabetic and poly-alphabetic substitution techniques: Vigenere cipher, playfair cipher, transposition techniques: keyed and keyless transposition ciphers). Introduction to steganography.<br><br>**Self-learning Topics:** Study some more classical encryption techniques and solve more problems on all techniques. Homomorphic encryption in cloud computing | **07** | CO1 |
| II | Cryptography: Key management, distribution and user authentication | Block cipher modes of operation,Data Encryption Standard, Advanced Encryption Standard (AES). RC5 algorithm.<br>Public key cryptography: RSA algorithm. Hashing Techniques: SHA256, SHA-512, HMAC and CMAC,<br>Digital Signature Schemes – RSA, DSS. Remote user Authentication Protocols, Kerberos, Digital Certificate: X.509, PKI<br><br>**Self-learning Topics:** Study working of elliptical curve digital signature and its benefits over RSA digital signature. | **09** | CO2 |
| III | Malicious Software | SPAM, Trojan horse, Viruses, Worms, System Corruption, Attack Agents, Information Theft, Trapdoor, Keyloggers, Phishing, Backdoors, Rootkits, Denial of Service Attacks, Zombie<br><br>**Self-learning Topics:** Study the recent malicious software's and their effects. | **04** | CO3 |
| IV | IP Security, Transport level security and Email Security | IP level Security: Introduction to IPSec, IPSec Architecture, Protection Mechanism (AH and ESP), Transport level security: VPN. Need Web Security considerations, Secure Sockets Layer (SSL)Architecture, Transport Layer Security (TLS), HTTPS, Secure Shell (SSH) Protocol Stack. Email Security: Secure Email S/MIME<br>Screen reader support enabled.<br><br>**Self-learning Topics:** Study Gmail security and privacy from Gmail help | **07** | CO4 |
| V | Network Management Security and Network Access Control | Network Management Security SNMPv3, NAC:Principle elements of NAC,Principle NAC enforcement methods, How to implement NAC Solutions, Use cases for network access control<br><br>**Self-learning Topics:** Explore any open source network management security tool | **06** | CO5 |

| | | | | |
|---|---|---|---|---|
| VI | System Security | IDS, Firewall Design Principles, Characteristics of Firewalls, Types of Firewalls<br><br>**Self-learning Topics:** Study firewall rules table | **04** | CO6 |

**Textbooks:**

1 William Stallings, Cryptography and Network Security, Principles and Practice, 6th Edition, Pearson Education, March 2013.
2 Behrouz A. Ferouzan, "Cryptography & Network Security", Tata Mc Graw Hill.
3 Mark Stamp's Information Security Principles and Practice, Wiley
4 Bernard Menezes, "Cryptography & Network Security", Cengage Learning.

**References:**

1 Applied Cryptography, Protocols, Algorithms and Source Code in C, Bruce Schneier, Wiley.
2 Cryptography and Network Security, Atul Kahate, Tata Mc Graw Hill.
3 www.rsa.com

**Online References:**

| Sr. No. | Website Name |
|---|---|
| 1. | https://swayam.gov.in/ |
| 2. | https://nptel.ac.in/ |
| 3. | https://www.coursera.org/ |

**Assessment:**
**Internal Assessment (IA) for 20 marks:**

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marksQ.1** will be **compulsory** and should **cover maximum contents of the syllabus**
- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)
- A total of **four questions** need to be answered

K.C. College of Engg. and Management Studies and Research ★ THANE (E)

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

**Practical & Oral Exam: An Practical & Oral exam will be held based on the above syllabus.**

| Course Code | Course Name | Teaching Scheme (Contact Hours) | | Credits Assigned | | |
|---|---|---|---|---|---|---|
| | | Theory | Practical | Theory | Practical | Total |
| ITL502 | Security Lab | -- | 02 | -- | 01 | 01 |

| Course Code | Course Name | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Theory | | | | | Term Work | Pract / Oral | Total |
| | | Internal Assessment | | | End Sem Exam | Exam Duration (in Hrs) | | | |
| | | Test1 | Test 2 | Avg. | | | | | |
| ITL502 | Security Lab | -- | -- | -- | -- | -- | 25 | 25 | 50 |

**Lab Objectives:**

| Sr. No. | Lab Objectives |
|---|---|
| The Lab experiments aims: | |
| 1 | To apply the knowledge of symmetric cryptography to implement classical ciphers. |
| 2 | To analyze and implement public key encryption algorithms, hashing and digital signature algorithms. |
| 3 | To explore the different network reconnaissance tools to gather information about networks. |
| 4 | To explore the tools like sniffers, port scanners and other related tools for analyzing. |
| 5 | To Scan the network for vulnerabilities and simulate attacks. |
| 6 | To set up intrusion detection systems using open-source technologies and to explore email security. |

**Lab Outcomes:**

| Sr. No. | Lab Outcomes | Cognitive levels of attainment as per Bloom's Taxonomy |
|---|---|---|
| On successful completion, of course, learner/student will be able to: | | |
| 1 | Illustrate symmetric cryptography by implementing classical ciphers. | L1,L2 |
| 2 | Demonstrate Key management, distribution and user authentication. | L1,L2 |
| 3 | Explore the different network reconnaissance tools to gather information about networks | L1,L2, L3 |
| 4 | Use tools like sniffers, port scanners and other related tools for analyzing packets in a network. | L1,L2,L3 |
| 5 | Use open-source tools to scan the network for vulnerabilities and simulate attacks. | L1,L2,L3 |
| 6 | Demonstrate the network security system using open source tools. | L1,L2 |

**Prerequisite:** Basic concepts of Computer Networks & Network Design, Operating System

**Hardware & Software Requirements:**

| Hardware Requirement: | Software requirement: |
|---|---|
| PC With following Configuration<br>1. Intel Core i3/i5/i7 Processor<br>2. 4 GB RAM<br>3. 500 GB Harddisk | 1. Windows or Linux Desktop OS<br>2. wireshark<br>3. ARPWATCH<br>4. Kismet, NetStumbler<br>5. NESSU |

**DETAILED SYLLABUS:**

| Sr. No. | Detailed Content | Hours | LO Mapping |
|---|---|---|---|
| I | Classical Encryption techniques (mono-alphabetic and poly-alphabetic substitution techniques: Vigenere cipher, playfair cipher) | **04** | LO1 |
| II | 1)Block cipher modes of operation using a)Data Encryption Standard b)Advanced Encryption Standard (AES).<br>2)Public key cryptography: RSA algorithm.<br>3)Hashing Techniques: HMAC using SHA<br>4)Digital Signature Schemes – RSA, DSS. | **06** | LO2 |
| III | 1) Study the use of network reconnaissance tools like WHOIS, dig, traceroute, nslookup to gather information about networks and domain registrars.<br>2) Study of packet sniffer tools Wireshark, :- a. Observer performance in promiscuous as well as non-promiscuous mode.<br>b. Show the packets can be traced based on different filters. | **04** | LO3 |
| IV | 1) Download and install nmap.<br>2) Use it with different options to scan open ports, perform OS fingerprinting, ping scan, tcp port scan, udp port scan, etc. | **04** | LO4 |
| V | a) Keylogger attack using a keylogger tool.<br>b) Simulate DOS attack using Hping or other tools<br>c) Use the NESSUS/ISO Kali Linux tool to scan the network for vulnerabilities. | **04** | LO5 |
| VI | 1) Set up IPSec under Linux.<br>2) Set up Snort and study the logs.<br>3) Explore the GPG tool to implement email security | **04** | LO6 |

**Text Books**


1 Build your own Security Lab, Michael Gregg, Wiley India.
2 CCNA Security, Study Guide, TIm Boyles, Sybex.
3 Hands-On Information Security Lab Manual, 4th edition, Andrew Green, Michael Whitman,

Herbert Mattord.

4 The Network Security Test Lab: A Step-by-Step Guide Kindle Edition, Michael Gregg.

**References:**


1 Network Security Bible, Eric Cole, Wiley India.
2 Network Defense and Countermeasures, William (Chuck) Easttom.
3 Principles of Information Security + Hands-on Information Security Lab Manual, 4th Ed. , Michae E. Whitman , Herbert J. Mattord.
4 IITB virtual Lab: http://cse29-iiith.vlabs.ac.in/
5 https://www.dcode.fr/en


| Sr.No | Experiment Title |
|---|---|
| 1. | Breaking the Mono-alphabetic Substitution Cipher using Frequency analysis method. |
| 2. | Design and Implement a product cipher using Substitution ciphers. |
| 3. | Cryptanalysis or decoding Playfair, vigenere cipher. |
| 4. | Encrypt long messages using various modes of operation using AES or DES. |
| 5. | Cryptographic Hash Functions and Applications (HMAC): to understand the need, design and applications of collision resistant hash functions. |
| 6. | Implementation and analysis of RSA cryptosystem and Digital signature scheme using RSA. |
| 7. | Study the use of network reconnaissance tools like WHOIS, dig, traceroute, nslookup to gather information about networks and domain registrars. |
| 8. | Study of packet sniffer tools wireshark: - a. Observer performance in promiscuous as well as non-promiscuous mode. b. Show the packets can be traced based on different filters. |
| 9. | Download, install nmap and use it with different options to scan open ports, perform OS fingerprinting, ping scan, tcp port scan, udp port scan, etc. |
| 10. | Study of malicious software using different tools:<br>a) Keylogger attack using a keylogger tool.<br>b) Simulate DOS attack using Hping or other tools<br>c) Use the NESSUS/ISO Kali Linux tool to scan the network for vulnerabilities. |
| 11. | Study of Network security by<br>a) Set up IPSec under Linux.<br>b) Set up Snort and study the logs.<br>c) Explore the GPG tool to implement email security |

**Term Work:** Term Work shall consist of at least 12 to 15 practicals based on the above list. Also Term work Journal must include at least 2 assignments.

**Term Work Marks:** 25 Marks (Total marks) = 15 Marks (Experiment) + 5 Marks (Assignments) + 5 Marks (Attendance)

**Practical & Oral Exam: An Practical & Oral exam will be held based on the above syllabus.**

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| Course Code | Course Name | Credits |
|---|---|---|
| ILO7016 | Cyber Security and Laws | 03 |

**Objectives:**

1. To understand and identify different types cybercrime and cyber law
2. To recognized Indian IT Act 2008 and its latest amendments
3. To learn various types of security standards compliances

**Outcomes:** Learner will be able to…

1. Understand the concept of cybercrime and its effect on outside world
2. Interpret and apply IT law in various legal issues
3. Distinguish different aspects of cyber law
4. Apply Information Security Standards compliance during software design and development

| Module | Detailed Contents | Hrs |
|---|---|---|
| 01 | **Introduction to Cybercrime:** Cybercrime definition and origins of the world, Cybercrime and information security, Classifications of cybercrime, Cybercrime and the Indian ITA 2000, A global Perspective on cybercrimes. | 4 |
| 02 | **Cyber offenses & Cybercrime:** How criminal plan the attacks, Social Engg, Cyber stalking, Cyber café and Cybercrimes, Bot nets, Attack vector, Cloud computing, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication Service Security, Attacks on Mobile/Cell Phones, Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile, Devices-Related Security Issues, Organizational Security Policies and Measures in Mobile Computing Era, Laptops | 9 |
| 03 | **Tools and Methods Used in Cyber line**<br>Phishing, Password Cracking, Key loggers and Spywares, Virus and Worms, Steganography, DoS and DDoS Attacks, SQL Injection, Buffer Over Flow, Attacks on Wireless Networks, Phishing, Identity Theft (ID Theft) | 6 |
| 04 | **The Concept of Cyberspace**<br>E-Commerce , The Contract Aspects in Cyber Law ,The Security Aspect of Cyber Law ,The Intellectual Property Aspect in Cyber Law , The Evidence Aspect in Cyber Law , The Criminal Aspect in Cyber Law, Global Trends in Cyber Law , Legal Framework for Electronic Data Interchange Law Relating to Electronic Banking , The Need for an Indian Cyber Law | 8 |
| 05 | **Indian IT Act.**<br>Cyber Crime and Criminal Justice : Penalties, Adjudication and Appeals Under the IT Act, 2000, IT Act. 2008 and its Amendments | 6 |
| 06 | **Information Security Standard compliances**<br>SOX, GLBA, HIPAA, ISO, FISMA, NERC, PCI. | 6 |

**Assessment:**

**Internal:**
Assessment consists of two tests out of which; one should be compulsory class test and the other is either a class test or assignment on live problems or course project.

**End Semester Theory Examination:**
Some guidelines for setting up the question paper. Minimum 80% syllabus should be covered in question papers of end semester examination.

**In question paper weightage of each module will be proportional to number of respective lecture hours as mention in the syllabus.**

1. Question paper will comprise of total six question
2. All question carry equal marks
3. Questions will be mixed in nature (for example supposed Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3)
4. Only Four question need to be solved.

**REFERENCES:**


1. Nina Godbole, Sunit Belapure, *Cyber Security*, Wiley India, New Delhi
2. The Indian Cyber Law by Suresh T. Vishwanathan; Bharat Law House New Delhi
3. The Information technology Act, 2000; Bare Act- Professional Book Publishers, New Delhi.
4. Cyber Law & Cyber Crimes By Advocate Prashant Mali; Snow White Publications, Mumbai
5. Nina Godbole, *Information Systems Security*, Wiley India, New Delhi
6. Kennetch J. Knapp, *Cyber Security &Global Information Assurance* Information Science Publishing.
7. William Stallings, *Cryptography and Network Security,* Pearson Publication
8. Websites for more information is available on : The Information Technology ACT, 2008- TIFR : https://www.tifrh.res.in
9. Website for more information , A Compliance Primer for IT professional : https://www.sans.org/reading-room/whitepapers/compliance/compliance-primer-professionals- 33538






Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| Course Code | Course Name | Teaching Scheme (Contact Hours) | | Credits Assigned | | |
|---|---|---|---|---|---|---|
| | | Theory | Practical | Theory | Practical | Total |
| ITC503 | Entrepreneurship and E-business | 03 | -- | 03 | -- | 03 |

| Course Code | Course Name | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Theory | | | | | Term Work | Pract / Oral | Total |
| | | Internal Assessment | | | End Sem Exam | Exam Duration (in Hrs) | | | |
| | | Test1 | Test2 | Avg. | | | | | |
| ITC503 | Entrepreneurship and E-business | 20 | 20 | 20 | 80 | 03 | -- | -- | 100 |

**Course Objectives:**

| Sr. No. | Course Objectives |
|---|---|
| The course aims: | |
| 1 | Distinguish Entrepreneur and Entrepreneurship starting and feasibility study. |
| 2 | Realize the skills required to be an entrepreneur |
| 3 | Acquaint the students with challenges of starting new ventures |
| 4 | Identify the right sources of fund for starting a new business |
| 5 | Be familiarized with concept of E-business Models. |
| 6 | Understand various E-business Strategies. |

**Course Outcomes:**

| Sr. No. | Course Outcomes | Cognitive levels of attainment as per Bloom's Taxonomy |
|---|---|---|
| On successful completion, of course, learner/student will be able to: | | |
| 1 | Understand the concept of entrepreneurship and its close relationship with enterprise and owner-management. | L1,L2 |
| 2 | Understand the nature of business development in the context of existing organizations and of new business start-ups. | L1,L2 |
| 3 | Comprehended important factors for starting a new venture and business development. | L1,L2,L3 |
| 4 | Know issues and decisions involved in financing and resourcing a business start-up | L1,L2,L3,L4 |
| 5 | Describe various E-business Models | L1,L2,L3,L4 |
| 6 | Discuss various E-business Strategies. | L1,L2,L3,L4 |

**Prerequisite: None**

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering &
Management Studies & Research.

**DETAILED SYLLABUS:**

| Sr. No. | Module | Detailed Content | Hours | CO Mapping |
|---|---|---|---|---|
| 0 | Prerequisite | **None** | -- | -- |
| I | Introduction | Concept, meaning and definition of Entrepreneur and Entrepreneurship. Evolution of Entrepreneurship, Role of Entrepreneurship in economic Development; Managerial vs entrepreneurial approach; Classification and types of Entrepreneurs. Characteristics and qualities of successful Entrepreneurs; Women Entrepreneurs; Corporate & Social entrepreneurship.<br><br>**Self-learning Topics:** Factors impacting emergence of entrepreneurship. | **04** | CO1 |
| II | Entrepreneurship Development and Leadership | Entrepreneurial Motivation: motivating factors, Types of startups; Characteristics of entrepreneurial leadership, Components of Entrepreneurial Leadership; Factors influencing entrepreneurial development and motivation, Entrepreneurial Opportunities and challenges, Entrepreneurship process. Types of Enterprises and Ownership Structure: small scale, medium scale and large-scale enterprises: Meaning and definition (evolution), role of small enterprises in economic development; proprietorship, Policies governing SMEs, partnership, Ltd. companies and co-operatives: their formation, capital structure and source of finance.<br><br>**Self-learning Topics:** study the white paper https://www.ncert.nic.in/ncerts/l/lebs213.pdf | **06** | CO2 |
| III | New Venture Planning | Methods to Initiate Ventures; Acquisition-Advantages of acquiring an ongoing venture and examination of key issues; Developing a Marketing plan-customer analysis, sales analysis and competition analysis, Business Plan-benefits of drivers, perspectives in business plan preparation, elements of a business plan; Business plan failures.<br><br>**Self-learning Topics:** Refer following URL to study various case studies https://www.entrepreneurindia.co/case-studies | **07** | CO3 |
| IV | Financing & Managing Venture | Financing Stages; Sources of Finance; Venture Capital; Criteria for evaluating new-venture proposals & Capital-process. Management of venture: objectives and functions of management, scientific management, general and strategic management; introduction to human resource management: planning, job analysis, training, recruitment and selection<br><br>**Self-learning Topics:** visit website | **06** | CO4 |

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| | | | | |
|---|---|---|---|---|
| | | https://www.startupindia.gov.in | | |
| V | Overview of E – business | Concept of E-business, Business Success through adoption of technology, information management for business Initiatives, Performance improvement through e-business. Introduction to various collaborative partnerships, E-commerce: Sectors of e-commerce, B to C, B to B and C to C ecommerce, E-commerce success factors, clicks and Bricks in ecommerce, collaborative commerce. E-Marketplace, M-commerce, E-Government; Various E-business Models, Challenges of the E-Business Models, Globalization of E-business.<br><br>**Self-learning Topics:** Social media applications for E-Business, Social media analytics. | **08** | CO5 |
| VI | Strategic Initiatives for Technology | **Customer Relationship Management:**<br>The evolution of CRM, functional areas of CRM, contemporary trends - SRM, PRM AND ERM, Future Trends of CRM<br>**Enterprise Resource Planning**:<br>Core and Extended ERP; components of ERP system; Benefits and Risks of ERP implementation<br>**Supply Chain Management**:<br>Meaning, definition, importance, and characteristics of SCM, Elements of SCM, Push & Pull supply chain model, Use of e-business to restructure supply chain, Supply chain management implementation<br>**Procurement**:<br>Meaning and advantages of e –procurement, Types& Drivers of e- procurement, Components of e-procurement systems, Implementation of e-procurement<br><br>**Self-learning Topics:** SEM and SEO E-CRM | **08** | CO6 |

**Textbooks:**


1 Entrepreneurship; Robert Hisrich, Michael Peters; Tata McGraw Hill Publication
2 Entrepreneurship: New venture creation by David Holt, Prentice Hall of India Pvt. Ltd.
3 E- Business & E– Commerce Management: Strategy, Implementation, Practice – Dave Chaffey, Pearson Education
4 E-commerce – A Managerial Perspective- P. T. Joseph, Prentice Hall India Publications. Content


**References:**


1 Entrepreneurship and Innovations in E-business An Integrative Perspective by Fang Zhao, Idea Group Publications.
2 Business Driven Technology –Haag/Baltzan/Philips –Tata McGraw Hill Publication
3 Digital Business and E-commerce Management by Dave Chaffey, David Edmundson Bird, Tanya Hemphill, Pearson Education
4 E-Business 2.0 Roadmap for Success by Dr. Ravi Kalakota, Marcia Robinson, Pearson Education
5 Case Studies in International Entrepreneurship: Managing and Financing Ventures in the Global Economy. By Walter Kuemmerle, Walter Kuemmerle. McGraw-Hill/Irwin, 2004.

ISBN: 0072977841.

**Note: -** It is advisable that faculty should discuss case studies in the classroom

**Assessment:**

**Internal Assessment (IA) for 20 marks:**

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marksQ.1** will be **compulsory** and should **cover maximum contents of the syllabus**
- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)
- A total of **four questions** need to be answered

| Course Code | Course Name | Teaching Scheme (Contact Hours) | | Credits Assigned | | |
|---|---|---|---|---|---|---|
| | | Theory | Practical | Theory | Practical | Total |
| ITDO6014 | Ethical Hacking and Forensics | 03 | -- | 03 | -- | 03 |

| Course Code | Course Name | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Theory Marks | | | | Term Work | Practical | Oral | Total |
| | | Internal assessment | | | End Sem. Exam | | | | |
| | | Test1 | Test 2 | Avg. | | | | | |
| ITDO6014 | Ethical Hacking and Forensics | 20 | 20 | 20 | 80 | -- | -- | -- | 100 |

**Course Objectives:**

| Sr. No. | Course Objectives |
|---|---|
| The course aims: | |
| 1 | To understand the concept of cybercrime and principles behind ethical hacking. |
| 2 | To explore the fundamentals of digital forensics, digital evidence and incident response. |
| 3 | To learn the tools and techniques required for computer forensics. |
| 4 | To understand the network attacks and tools and techniques required to perform network forensics. |
| 5 | To learn how to investigate attacks on mobile platforms. |
| 6 | To generate a forensics report after investigation. |

**Course Outcomes:**

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering &
Research.

| Sr. No. | Course Outcomes | Cognitive levels of attainment as per Bloom's Taxonomy |
|---|---|---|
| On successful completion, of course, learner/student will be able to: | | |
| 1 | Define the concept of ethical hacking. | L1 |
| 2 | Recognize the need of digital forensics and define the concept of digital evidence and incident response. | L1,L2 |
| 3 | Apply the knowledge of computer forensics using different tools and techniques. | L1,L2,L3 |
| 4 | Detect the network attacks and analyze the evidence. | L1, L2,L3,L4 |
| 5 | Apply the knowledge of computer forensics using different tools and techniques. | L1,L2,L3 |
| 6 | List the method to generate legal evidence and supporting investigation reports | L1,L2 |

**Prerequisite:** Computer Networks, Computer Network Security

**DETAILED SYLLABUS:**

| Sr. No. | Module | Detailed Content | Hours | CO Mapping |
|---|---|---|---|---|
| 0 | Prerequisite | Computer Networks, Computer Network Security | **01** | -- |
| I | **Cybercrime and Ethical Hacking** | Introduction to Cybercrime, Types of Cybercrime, Classification of Cybercriminals, Role of computer in Cybercrime, Prevention of Cybercrime.<br>Ethical Hacking, Goals of Ethical Hacking, Phases of Ethical Hacking, Difference between Hackers, Crackers and Phreakers, Rules of Ethical Hacking.<br>**Self Learning Topics**: exploring various online hacking tools for Reconnaissance and scanning Phase. | **06** | CO1 |
| II | **Digital Forensics Fundamentals** | Introduction to Digital Forensics, Need and Objectives of Digital Forensics, Types of Digital Forensics, Process of Digital Forensics, Benefits of Digital Forensics, Chain of Custody, Anti Forensics.<br>Digital Evidence and its Types, Rules of Digital Evidences.<br>Incident Response, Methodology of Incident Response, Roles of CSIRT in handling incident.<br>**Self Learning Topics:** Pre-Incident preparation and Incident Response process. | **06** | CO2 |
| III | **Computer Forensics** | Introduction to Computer Forensics, Evidence collection (Disk, Memory, Registry, Logs etc), Evidence Acquisition, Analysis and Examination(Window, Linux, Email, Web, Malware) , Challenges in Computer Forensics, Tools used in Computer Forensics. | **08** | CO3 |

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| | | | | |
|---|---|---|---|---|
| | | **Self Learning Topics:** Open source tool for Data collection & analysis in windows or Unix | | |
| IV | **Network Forensics** | Introduction, Evidence Collection and Acquisition (Wired and Wireless), Analysis of network evidences(IDS, Router,), Challenges in network forensics, Tools used in network forensics. **Self Learning Topics:** IDS types and role of IDS in attack prevention | **08** | CO4 |
| V | **Mobile Forensics** | Introduction, Evidence Collection and Acquisition, Analysis of Evidences, Challenges in mobile forensics, Tools used in mobile forensics **Self Learning Topics**: Tools / Techniques used in mobile forensics | **06** | CO5 |
| VI | **Report Generation** | Goals of Report, Layout of an Investigative Report, Guidelines for Writing a Report, sample for writing a forensic report. **Self Learning Topics**: For an incident write a forensic report. | **04** | CO6 |

**Text Books:**

**1.** John Sammons, "The Basics of Digital Forensics: The Premier for Getting Started in Digital Forensics", 2nd Edition, Syngress, 2015.
**2.** Nilakshi Jain, Dhananjay Kalbande, "Digital Forensic: The fascinating world of Digital Evidences" Wiley India Pvt Ltd 2017.
**3.** Jason Luttgens, Matthew Pepe, Kevin Mandia, "Incident Response and computer forensics",3rd Edition Tata McGraw Hill, 2014.

**References:**

**1.** Sangita Chaudhuri, Madhumita Chatterjee, "Digital Forensics", Staredu, 2019.
**2.** Bill Nelson,Amelia Phillips,Christopher Steuart, "Guide to Computer Forensics and Investigations" Cengage Learning, 2014.
**3.** Debra Littlejohn Shinder Michael Cross "Scene of the Cybercrime: Computer Forensics Handbook", 2nd Edition Syngress Publishing, Inc.2008.

**Assessment:**
**Internal Assessment (IA) for 20 marks:**

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marksQ.1** will be **compulsory** and should **cover maximum contents of the syllabus**
- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)
- A total of **four questions** need to be answered

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering &
Research

| Course Code | Course Name | Teaching Scheme (Contact Hours) | | | Credits Assigned | | | |
|---|---|---|---|---|---|---|---|---|
| | | Theory | Practical | Tutorial | Theory | Practical | Tutorial | Total |
| ITM701 | Major Project – I | -- | 06 | -- | -- | 03 | -- | 03 |

| Course Code | Course Name | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Theory Marks | | | | Term Work | Pract. /Oral | Total |
| | | Internal assessment | | | End Sem. Exam | | | |
| | | Test1 | Test 2 | Avg. | | | | |
| ITM701 | Major Project – I | -- | -- | -- | -- | 25 | 25 | 50 |

**Course Objectives**

1. To acquaint with the process of identifying the needs and converting it into the problem.
2. To familiarize the process of solving the problem in a group.
3. To acquaint with the process of applying basic engineering fundamentals to attempt solutions to the proble
4. To inculcate the process of self-learning and research.

**Course Outcome:** Learner will be able to…

1. Identify problems based on societal /research needs.
2. Apply Knowledge and skill to solve societal problems in a group.
3. Develop interpersonal skills to work as member of a group or leader.
4. Draw the proper inferences from available results through theoretical/ experimental/simulations.
5. Analyse the impact of solutions in societal and environmental context for sustainable development.
6. Use standard norms of engineering practices
7. Excel in written and oral communication.
8. Demonstrate capabilities of self-learning in a group, which leads to life long learning.
9. Demonstrate project management principles during project work.

**Guidelines for Major Project**

- Students shall form a group of 3 to 4 students, while forming a group shall not be allowed less than three o more than four students, as it is a group activity.
- Students should do survey and identify needs, which shall be converted into problem statement for min project in consultation with faculty supervisor/head of department/internal committee of faculties.
- Students shall submit implementation plan in the form of Gantt/PERT/CPM chart, which will cover weekly activity of major project-I and major project-II.
- A log book to be prepared by each group, wherein group can record weekly work progress, guide/supervisor can verify and record notes/comments.
- Faculty supervisor may give inputs to students during major project-I & II activity; however, focus shall be on self-learning.
- Students in a group shall understand problem effectively, propose multiple solution and select best possible solution in consultation with guide/ supervisor.

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering &

- Students shall convert the best solution into working model using various components of their domain areas and demonstrate.
- The solution to be validated with proper justification and report to be compiled in standard format of University of Mumbai.
- With the focus on the self-learning, innovation, addressing societal problems and entrepreneurship quality development within the students through the Major Project, it is preferable that a single project of appropriate level and quality to be carried out in two semesters by all the groups of the students. i.e. Major Project-I in semester VII and Major Project-II in semesters VIII.
- However, based on the individual students or group capability, with the mentor's recommendations, if the proposed Major Project adhering to the qualitative aspects mentioned above gets completed in odd semester, then that group can be allowed to Scopus paper publications in Journal/Conference or motivate for Copyright or Indian Patent as an extension of the Major Project-1 with suitable improvements/modifications after testing and analysis in even semester. This policy can be adopted on case by case basis.

**Guidelines for Assessment of Major Project:**

**Term Work**

1. The review/ progress monitoring committee shall be constituted by head of departments of each institute. The progress of major project to be evaluated on continuous basis, minimum two reviews in each semester VII and VIII.
2. In continuous assessment focus shall also be on each individual student, assessment based on individual's contribution in group activity, their understanding and response to questions.
3. Distribution of Term work marks for both semesters shall be as below;
    a. Marks awarded by guide/supervisor based on log book : 10
    b. Marks awarded by review committee : 10
    c. Quality of Project report : 05

**Review/progress monitoring committee may consider following points for assessment based on either one year major project as mentioned in general guidelines.**

**One-year project:**

- In semester VII entire theoretical solution shall be ready, including components/system selection and cost analysis, building of working prototype. Two reviews will be conducted based on presentation given by students group.
    - First shall be for finalization of problem and proposed solution of the problem
    - Second shall be on readiness of working and testing of prototype to be conducted.
- In semester VIII expected work shall be procurement of testing and validation of results based on work completed in an odd semester.
    - First review is based on improvements in testing and validation results cum demonstration for publication to be conducted.
    - Second review shall be based on paper presentation in conference/journal or copyright or Indian patent in last month of the said semester.

**Assessment criteria of Major Project.**

**Major Project** shall be assessed based on following criteria;

1. Quality of survey/ need identification
2. Clarity of Problem definition based on need.
3. Innovativeness in solutions
4. Feasibility of proposed problem solutions and selection of best solution

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| Course Code | Course Name | Teaching Scheme (Contact Hours) | | | Credits Assigned | | | |
|---|---|---|---|---|---|---|---|---|
| | | Theory | Practical | Tutorial | Theory | Practical | Tutorial | Total |
| ITM601 | Mini Project – 2 B Web Based on ML | -- | 04 | -- | -- | 02 | -- | 02 |

| Course Code | Course Name | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Theory Marks | | | | Term Work | Pract. /Oral | Total |
| | | Internal assessment | | | End Sem. Exam | | | |
| | | Test1 | Test 2 | Avg. | | | | |
| ITM601 | Mini Project – 2 B Based on ML | -- | -- | -- | -- | 25 | 25 | 50 |

**Course Objectives**

5. To acquaint with the process of identifying the needs and converting it into the problem.
6. To familiarize the process of solving the problem in a group.
7. To acquaint with the process of applying basic engineering fundamentals to attempt solutions to the problems.
8. To inculcate the process of self-learning and research.

**Course Outcome:** Learner will be able to…

10. Identify problems based on societal /research needs.
11. Apply Knowledge and skill to solve societal problems in a group.
12. Develop interpersonal skills to work as member of a group or leader.
13. Draw the proper inferences from available results through theoretical/ experimental/simulations.
14. Analyse the impact of solutions in societal and environmental context for sustainable development.
15. Use standard norms of engineering practices
16. Excel in written and oral communication.
17. Demonstrate capabilities of self-learning in a group, which leads to life long learning.
18. Demonstrate project management principles during project work.

Dr. Vilas N. Nitnaware
Principal

**Guidelines for Mini Project**

- Students shall form a group of 3 to 4 students, while forming a group shall not be allowed less than three or more than four students, as it is a group activity.
- Students should do survey and identify needs, which shall be converted into problem statement for mini project in consultation with faculty supervisor/head of department/internal committee of faculties.
- Students hall submit implementation plan in the form of Gantt/PERT/CPM chart, which will cover weekly activity of mini project.
- A log book to be prepared by each group, wherein group can record weekly work progress, guide/supervisor can verify and record notes/comments.
- Faculty supervisor may give inputs to students during mini project activity;however, focus shall be on self-learning.
- Students in a group shall understand problem effectively, propose multiple solution and select best possible solution in consultation with guide/ supervisor.
- Students shall convert the best solution into working model using various components of their domain areas and demonstrate.
- The solution to be validated with proper justification and report to be compiled in standard format of University of Mumbai.
- With the focus on the self-learning, innovation, addressing societal problems and entrepreneurship quality development within the students through the Mini Projects, it is preferable that a single project of appropriate level and quality to be carried out in two semesters by all the groups of the students. i.e. Mini Project 1 in semester III and IV. Similarly, Mini Project 2 in semesters V and VI.
- However, based on the individual students or group capability, with the mentor's recommendations, if the proposed Mini Project adhering to the qualitative aspects mentioned above gets completed in odd semester, then that group can be allowed to work on the extension of the Mini Project with suitable improvements/modifications or a completely new project idea in even semester. This policy can be adopted on case by case basis.

**Guidelines for Assessment of Mini Project:**

**Term Work**

- The review/ progress monitoring committee shall be constituted by head of departments of each institute. The progress of mini project to be evaluated on continuous basis, minimum two reviews in each semester.
- In continuous assessment focus shall also be on each individual student, assessment based on individual's contribution in group activity, their understanding and response to questions.
- Distribution of Term work marks for both semesters shall be as below;
    - Marks awarded by guide/supervisor based on log book : 10
    - Marks awarded by review committee : 10
    - Quality of Project report : 05

**Review/progress monitoring committee may consider following points for assessment based on either one year or half year project as mentioned in general guidelines.**

**One-year project:**

- In first semester entire theoretical solution shall be ready, including components/system selection and cost analysis. Two reviews will be conducted based on presentation given by students group.
    - First shall be for finalisation of problem
    - Second shall be on finalisation of proposed solution of problem.
- In second semester expected work shall be procurement of component's/systems, building of working prototype, testing and validation of results based on work completed in an earlier semester.
    - First review is based on readiness of building working prototype to be conducted.
    - Second review shall be based on poster presentation cum demonstration of working model in last month of the said semester.

**Half-year project:**

- In this case in one semester students' group shall complete project in all aspects including,
  - Identification of need/problem
  - Proposed final solution
  - Procurement of components/systems
  - Building prototype and testing
- Two reviews will be conducted for continuous assessment,
  - First shall be for finalisation of problem and proposed solution
  - Second shall be for implementation and testing of solution.

**Assessment criteria of Mini Project.**

**Mini Project** shall be assessed based on following criteria;

14. Quality of survey/ need identification
15. Clarity of Problem definition based on need.
16. Innovativeness in solutions
17. Feasibility of proposed problem solutions and selection of best solution
18. Cost effectiveness
19. Societal impact
20. Innovativeness
21. Cost effectiveness and Societal impact
22. Full functioning of working model as per stated requirements
23. Effective use of skill sets
24. Effective use of standard engineering norms
25. Contribution of an individual's as member or leader
26. Clarity in written and oral communication

- In **one year, project**, first semester evaluation may be based on first six criteria's and remaining may be used for second semester evaluation of performance of students in mini project.
- In case of **half year project** all criteria's in generic may be considered for evaluation of performance of students in mini project.

**Guidelines for Assessment of Mini Project Practical/Oral Examination:**

- Report should be prepared as per the guidelines issued by the University of Mumbai.
- Mini Project shall be assessed through a presentation and demonstration of working model by the student project group to a panel of Internal and External Examiners preferably from industry or research organisations having experience of more than five years approved by head of Institution.
- Students shall be motivated to publish a paper based on the work in Conferences/students competitions.

**Mini Project** shall be assessed based on following points;

9. Quality of problem and Clarity
10. Innovativeness in solutions
11. Cost effectiveness and Societal impact
12. Full functioning of working model as per stated requirements
13. Effective use of skill sets
14. Effective use of standard engineering norms
15. Contribution of an individual's as member or leader
16. Clarity in written and oral communication

K.C. College of Engg. and Management Studies and Research THANE (E)

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| Course Code | Course Name | Teaching scheme | | | Credit assigned | | | |
|---|---|---|---|---|---|---|---|---|
| | | Theory | Pract. | Tut. | Theory | Pract. | Tut. | Total |
| ITL505 | Professional Communication & Ethics-II (PCE-II) | -- | 2*+ 2 Hours (Batch-wise) | -- | -- | 02 | -- | 02 |

***Theory class to be conducted for full class.**

| Course Code | Course Name | Examination Scheme | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Theory | | | | | Term work | Pract | Oral | Internal Oral | Total |
| | | Internal Assessment | | | End sem | Duration (hrs) | | | | | |
| | | Test 1 | Test 2 | Avg. | | | | | | | |
| ITL505 | Professional Communication & Ethics-II (PCE-II) | -- | -- | -- | -- | -- | 25 | -- | -- | 25 | 50 |

| Course Code | Course Name | Credits |
|---|---|---|
| ITL505 | Professional Communication & Ethics-II (PCE-II) | 02 |
| **Course Rationale** | This curriculum is designed to build up a professional and ethical approach, effective oral and written communication with enhanced soft skills. Through practical sessions, it augments student's interactive competence and confidence to respond appropriately and creatively to the implied challenges of the global Industrial and Corporate requirements. It further inculcates the social responsibility of engineers as technical citizens. | |
| **Course Objectives** | • To discern and develop an effective style of writing important technical/business documents.<br>• To investigate possible resources and plan a successful job campaign.<br>• To understand the dynamics of professional communication in the form of group discussions, meetings, etc. required for career enhancement.<br>• To develop creative and impactful presentation skills.<br>• To analyze personal traits, interests, values, aptitudes and skills.<br>• To understand the importance of integrity and develop a personal code of ethics. | |
| **Course Outcomes** | **Learner will be able to…**<br>• plan and prepare effective business/ technical documents which will in turn provide solid foundation for their future managerial roles.<br>• strategize their personal and professional skills to build a professional image and meet the demands of the industry.<br>• emerge successful in group discussions, meetings and result-oriented agreeable solutions in group communication situations.<br>• deliver persuasive and professional presentations.<br>• develop creative thinking and interpersonal skills required for effective professional communication.<br>• apply codes of ethical conduct, personal integrity and norms of organizational behaviour. | |

K.C. College of Engg. and Management Studies and Research THANE (E)

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Research

| Module | Contents | Hours |
|---|---|---|
| 1 | **ADVANCED TECHNICAL WRITING :PROJECT/PROBLEM BASED LEARNING (PBL)**<br><br>**1.1 Purpose and Classification of Reports:**<br>**Classification on the basis of:**<br>• Subject Matter (Technology, Accounting, Finance, Marketing, etc.)<br>• Time Interval (Periodic, One-time, Special)<br>• Function (Informational, Analytical, etc.)<br>• Physical Factors (Memorandum, Letter, Short & Long)<br>**1.2. Parts of a Long Formal Report:**<br>• Prefatory Parts (Front Matter)<br>• Report Proper (Main Body)<br>• Appended Parts (Back Matter)<br>**1.3. Language and Style of Reports**<br>• Tense, Person & Voice of Reports<br>• Numbering Style of Chapters, Sections, Figures, Tables and Equations<br>• Referencing Styles in APA & MLA Format<br>• Proofreading through Plagiarism Checkers<br>**1.4. Definition, Purpose & Types of Proposals**<br>• Solicited (in conformance with RFP) & Unsolicited Proposals<br>• Types (Short and Long proposals)<br>**1.5. Parts of a Proposal**<br>• Elements<br>• Scope and Limitations<br>• Conclusion<br>**1.6. Technical Paper Writing**<br>• Parts of a Technical Paper (Abstract, Introduction, Research Methods, Findings and Analysis, Discussion, Limitations, Future Scope and References)<br>• Language and Formatting<br>• Referencing in IEEE Format | 06 |
| 2 | **EMPLOYMENT SKILLS**<br>**2.1. Cover Letter & Resume**<br>• Parts and Content of a Cover Letter<br>• Difference between Bio-data, Resume & CV<br>• Essential Parts of a Resume<br>• Types of Resume (Chronological, Functional & Combination)<br>**2.2 Statement of Purpose**<br>• Importance of SOP<br>• Tips for Writing an Effective SOP<br>**2.3 Verbal Aptitude Test**<br>• Modelled on CAT, GRE, GMAT exams<br>**2.4. Group Discussions**<br>• Purpose of a GD<br>• Parameters of Evaluating a GD<br>• Types of GDs (Normal, Case-based & Role Plays) | 06 |

| | | |
|---|---|---|
| | • GD Etiquettes<br>**2.5. Personal Interviews**<br>• Planning and Preparation<br>• Types of Questions<br>• Types of Interviews (Structured, Stress, Behavioural, Problem Solving & Case-based)<br>• Modes of Interviews: Face-to-face (One-to one and Panel) Telephonic, Virtual | |
| 3 | **BUSINESS MEETINGS**<br>**1.1. Conducting Business Meetings**<br>• Types of Meetings<br>• Roles and Responsibilities of Chairperson, Secretary and Members<br>• Meeting Etiquette<br>**3.2. Documentation**<br>• Notice<br>• Agenda<br>• Minutes | **02** |
| 4 | **TECHNICAL/ BUSINESS PRESENTATIONS**<br>**1.1 Effective Presentation Strategies**<br>• Defining Purpose<br>• Analyzing Audience, Location and Event<br>• Gathering, Selecting &Arranging Material<br>• Structuring a Presentation<br>• Making Effective Slides<br>• Types of Presentations Aids<br>• Closing a Presentation<br>• Platform skills<br>**1.2 Group Presentations**<br>• Sharing Responsibility in a Team<br>• Building the contents and visuals together<br>• Transition Phases | **02** |
| 5 | **INTERPERSONAL SKILLS**<br>**1.1. Interpersonal Skills**<br>• Emotional Intelligence<br>• Leadership & Motivation<br>• Conflict Management & Negotiation<br>• Time Management<br>• Assertiveness<br>• Decision Making<br>**5.2 Start-up Skills**<br>• Financial Literacy<br>• Risk Assessment<br>• Data Analysis (e.g. Consumer Behaviour, Market Trends, etc.) | **08** |
| 6 | **CORPORATE ETHICS**<br>**6.1Intellectual Property Rights**<br>• Copyrights<br>• Trademarks<br>• Patents<br>• Industrial Designs | **02** |

| | | |
|---|---|---|
| | • Geographical Indications<br>• Integrated Circuits<br>• Trade Secrets (Undisclosed Information)<br>**6.2 Case Studies**<br>• Cases related to Business/ Corporate Ethics | |

**List of assignments:**
**(In the form of Short Notes, Questionnaire/ MCQ Test, Role Play, Case Study, Quiz, etc.)**

1. Cover Letter and Resume
2. Short Proposal
3. Meeting Documentation
4. Writing a Technical Paper/ Analyzing a Published Technical Paper
5. Writing a SOP
6. IPR
7. Interpersonal Skills
8. Aptitude test (Verbal Ability)

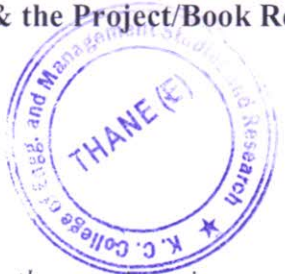
**Note:**

1. The Main Body of the project/book report should contain minimum 25 pages (excluding Front and Back matter).
2. The group size for the final report presentation should not be less than 5 students or exceed 7 students.
3. There will be an end–semester presentation based on the book report.

**Assessment**:

***Term Work***:
Term work shall consist of minimum 8 experiments.
The distribution of marks for term work shall be as follows:
Assignment : 10 Marks
Attendance : 5 Marks
Presentation slides : 5 Marks
Book Report (hard copy) : 5 Marks
The final certification and acceptance of term work ensures the satisfactory performance of laboratory work and minimum passing in the term work.

***Internal oral:***
**Oral Examination will be based on a GD & the Project/Book Report presentation.**
Group Discussion : 10 marks
Project Presentation : 10 Marks
Group Dynamics : 5 Marks




Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

**Books Recommended:**
**Textbooks and Reference books:**


1. Arms, V. M. (2005). *Humanities for the engineering curriculum: With selected chapters from Olsen/Huckin: Technical writing and professional communication, second edition*. Boston, MA: McGraw-Hill.
2. Bovée, C. L., &Thill, J. V. (2021). *Business communication today*. Upper Saddle River, NJ: Pearson.
3. Butterfield, J. (2017). *Verbal communication: Soft skills for a digital workplace*. Boston, MA: Cengage Learning.
4. Masters, L. A., Wallace, H. R., & Harwood, L. (2011).*Personal development for life and work*. Mason: South-Western Cengage Learning.
5. Robbins, S. P., Judge, T. A., & Campbell, T. T. (2017). *Organizational behaviour*. Harlow, England:

Pearson.
6. Meenakshi Raman, Sangeeta Sharma (2004) Technical Communication, Principles and Practice. Oxford University Press
7. Archana Ram (2018) Place Mentor, Tests of Aptitude For Placement Readiness. Oxford University Press
Sanjay Kumar &PushpLata (2018). Communication Skills a workbook, New Delhi: Oxford University Press.

| Course Code | Course Name | Teaching Scheme (Contact Hours) | | | Credits Assigned | | | |
|---|---|---|---|---|---|---|---|---|
| | | Theory | Practical | Tutorial | Theory | Practical | Tutorial | Total |
| ITM501 | Mini Project – 2 A Web Based Business Model | -- | 04 | -- | -- | 02 | -- | 02 |

| Course Code | Course Name | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Theory Marks | | | | Term Work | Pract. /Oral | Total |
| | | Internal assessment | | | End Sem. Exam | | | |
| | | Test1 | Test 2 | Avg. | | | | |
| ITM501 | Mini Project – 2 A Web Based Business Model | -- | -- | -- | -- | 25 | 25 | 50 |

**Course Objectives**

1. To acquaint with the process of identifying the needs and converting it into the problem.
2. To familiarize the process of solving the problem in a group.
3. To acquaint with the process of applying basic engineering fundamentals to attempt solutions to the problems.
4. To inculcate the process of self-learning and research.

**Course Outcome:** Learner will be able to…

1. Identify problems based on societal /research needs.
2. Apply Knowledge and skill to solve societal problems in a group.
3. Develop interpersonal skills to work as member of a group or leader.
4. Draw the proper inferences from available results through theoretical/ experimental/simulations.
5. Analyse the impact of solutions in societal and environmental context for sustainable development.
6. Use standard norms of engineering practices
7. Excel in written and oral communication.
8. Demonstrate capabilities of self-learning in a group, which leads to life long learning.
9. Demonstrate project management principles during project work.

**Guidelines for Mini Project**

- Students shall form a group of 3 to 4 students, while forming a group shall not be allowed less than three or more than four students, as it is a group activity.
- Students should do survey and identify needs, which shall be converted into problem statement for mini project in consultation with faculty supervisor/head of department/internal committee of faculties.
- Students hall submit implementation plan in the form of Gantt/PERT/CPM chart, which will cover weekly activity of mini project.
- A log book to be prepared by each group, wherein group can record weekly work progress, guide/supervisor can verify and record notes/comments.
- Faculty supervisor may give inputs to students during mini project activity; however, focus shall be on self-learning.

- Students in a group shall understand problem effectively, propose multiple solution and select best possible solution in consultation with guide/ supervisor.
- Students shall convert the best solution into working model using various components of their domain areas and demonstrate.
- The solution to be validated with proper justification and report to be compiled in standard format of University of Mumbai.
- With the focus on the self-learning, innovation, addressing societal problems and entrepreneurship quality development within the students through the Mini Projects, it is preferable that a single project of appropriate level and quality to be carried out in two semesters by all the groups of the students. i.e. Mini Project 1 in semester III and IV. Similarly, Mini Project 2 in semesters V and VI.
- However, based on the individual students or group capability, with the mentor's recommendations, if the proposed Mini Project adhering to the qualitative aspects mentioned above gets completed in odd semester, then that group can be allowed to work on the extension of the Mini Project with suitable improvements/modifications or a completely new project idea in even semester. This policy can be adopted on case by case basis.

**Guidelines for Assessment of Mini Project:**

**Term Work**

- The review/ progress monitoring committee shall be constituted by head of departments of each institute. The progress of mini project to be evaluated on continuous basis, minimum two reviews in each semester.
- In continuous assessment focus shall also be on each individual student, assessment based on individual's contribution in group activity, their understanding and response to questions.
- Distribution of Term work marks for both semesters shall be as below;
    - Marks awarded by guide/supervisor based on log book : 10
    - Marks awarded by review committee : 10
    - Quality of Project report : 05

**Review/progress monitoring committee may consider following points for assessment based on either one year or half year project as mentioned in general guidelines.**

**One-year project:**

- In first semester entire theoretical solution shall be ready, including components/system selection and cost analysis. Two reviews will be conducted based on presentation given by students group.
    - First shall be for finalisation of problem
    - Second shall be on finalisation of proposed solution of problem.
- In second semester expected work shall be procurement of component's/systems, building of working prototype, testing and validation of results based on work completed in an earlier semester.
    - First review is based on readiness of building working prototype to be conducted.
    - Second review shall be based on poster presentation cum demonstration of working model in last month of the said semester.

**Half-year project:**

- In this case in one semester students' group shall complete project in all aspects including,
    - Identification of need/problem
    - Proposed final solution
    - Procurement of components/systems
    - Building prototype and testing
- Two reviews will be conducted for continuous assessment,
    - First shall be for finalisation of problem and proposed solution
    - Second shall be for implementation and testing of solution


Dr. Vilas N. Nitnaware
Principal
K.C. College ... ering & ...
... & Research.

**Assessment criteria of Mini Project.**

**Mini Project** shall be assessed based on following criteria;

1. Quality of survey/ need identification
2. Clarity of Problem definition based on need.
3. Innovativeness in solutions
4. Feasibility of proposed problem solutions and selection of best solution
5. Cost effectiveness
6. Societal impact
7. Innovativeness
8. Cost effectiveness and Societal impact
9. Full functioning of working model as per stated requirements
10. Effective use of skill sets
11. Effective use of standard engineering norms
12. Contribution of an individual's as member or leader
13. Clarity in written and oral communication

- In **one year, project**, first semester evaluation may be based on first six criteria's and remaining may be used for second semester evaluation of performance of students in mini project.
- In case of **half year project** all criteria's in generic may be considered for evaluation of performance of students in mini project.

**Guidelines for Assessment of Mini Project Practical/Oral Examination:**

- Report should be prepared as per the guidelines issued by the University of Mumbai.
- Mini Project shall be assessed through a presentation and demonstration of working model by the student project group to a panel of Internal and External Examiners preferably from industry or research organisations having experience of more than five years approved by head of Institution.
- Students shall be motivated to publish a paper based on the work in Conferences/students competitions.

**Mini Project** shall be assessed based on following points;

1. Quality of problem and Clarity
2. Innovativeness in solutions
3. Cost effectiveness and Societal impact
4. Full functioning of working model as per stated requirements
5. Effective use of skill sets
6. Effective use of standard engineering norms
7. Contribution of an individual's as member or leader
8. Clarity in written and oral communication


**Dr. Vilas N. Nitnaware**
**Principal**
**K.C. College of Engineering & Management Studies & Research.**

| Course Code | Course Name | Credits |
|---|---|---|
| ILO7011 | Product Life Cycle Management | 03 |

**Course Objectives: Students will try :**

1. To familiarize the students with the need, benefits and components of PLM
2. To acquaint students with Product Data Management & PLM strategies
3. To give insights into new product development program and guidelines for designing and developing a product
4. To familiarize the students with Virtual Product Development

**Course Outcomes:** Students will be able to :

1. Gain knowledge about phases of PLM, PLM strategies and methodology for PLM feasibility study and PDM implementation.
2. Illustrate various approaches and techniques for designing and developing products.
3. Apply product engineering guidelines / thumb rules in designing products for moulding, machining, sheet metal working etc.
4. Acquire knowledge in applying virtual product development tools for components, machining and manufacturing plant

| Module | Detailed Contents | Hrs |
|---|---|---|
| 01 | **Introduction to Product Lifecycle Management (PLM):**Product Lifecycle Management (PLM), Need for PLM, Product Lifecycle Phases, Opportunities of Globalization, Pre-PLM Environment, PLM Paradigm, Importance & Benefits of PLM, Widespread Impact of PLM, Focus and Application, A PLM Project, Starting the PLM Initiative, PLM Applications<br>**PLM Strategies:**Industrial strategies, Strategy elements, its identification, selection and implementation, Developing PLM Vision and PLM Strategy ,<br>Change management for PLM | 10 |
| 02 | **ProductDesign:**Product Design and Development Process, Engineering Design, Organization and Decomposition in Product Design, Typologies of Design Process Models, Reference Model, Product Design in the Context of the Product Development Process, Relation with the Development Process Planning Phase, Relation with the Post design Planning Phase, Methodological Evolution in Product Design, Concurrent Engineering, Characteristic Features of Concurrent Engineering, Concurrent Engineering and Life Cycle Approach, New Product Development (NPD) and Strategies, Product Configuration and Variant Management, The Design for X System, Objective Properties and Design for X<br>Tools, Choice of Design for X Tools and Their Use in the Design Process | 09 |
| 03 | **Product Data Management (PDM):**Product and Product Data, PDM systems and importance, Components of PDM, Reason for implementing a PDM system, financial justification of PDM, barriers to PDM implementation | 05 |
| 04 | **Virtual Product Development Tools:**For components, machines, and manufacturing plants, 3D CAD systems and realistic rendering techniques, | 05 |

| | | |
|---|---|---|
| | Digital mock-up, Model building, Model analysis, Modeling and simulations in Product Design, Examples/Case studies | |
| 05 | **Integration of Environmental Aspects in Product Design:** Sustainable Development, Design for Environment, Need for Life Cycle Environmental Strategies, Useful Life Extension Strategies, End-of-Life Strategies, Introduction of Environmental Strategies into the Design Process, Life Cycle Environmental Strategies and Considerations for Product Design | 05 |
| 06 | **Life Cycle Assessment and Life Cycle Cost Analysis:** Properties, and Framework of Life Cycle Assessment, Phases of LCA in ISO Standards, Fields of Application and Limitations of Life Cycle Assessment, Cost Analysis and the Life Cycle Approach, General Framework for LCCA, Evolution of Models for Product Life Cycle Cost Analysis | 05 |

**Assessment:**

**Internal:**
Assessment consists of two tests out of which; one should be compulsory class test and the other is either a class test or assignment on live problems or course project.

**End Semester Theory Examination:**
Some guidelines for setting up the question paper.Minimum 80% syllabus should be covered in question papers of end semester examination. **In question paper weightage of each module will be proportional to number of respective lecture hours as mention in the syllabus.**

1. Question paper will comprise of total six question
2. All question carry equal marks
3. Questions will be mixed in nature (for example supposed Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3)
4. Only Four question need to be solved.

**REFERENCES:**


1. John Stark, "Product Lifecycle Management: Paradigm for 21st Century Product Realisation", Springer-Verlag, 2004. ISBN: 1852338105
2. Fabio Giudice, Guido La Rosa, AntoninoRisitano, "Product Design for the environment-A life cycle approach", Taylor & Francis 2006, ISBN: 0849327229
3. SaaksvuoriAntti, ImmonenAnselmie, "Product Life Cycle Management", Springer, Dreamtech, ISBN: 3540257314
4. Michael Grieve, "Product Lifecycle Management: Driving the next generation of lean thinking", Tata McGraw Hill, 2006, ISBN: 0070636265





Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| Course Code | Course Name | Teaching Scheme (Contact Hours) | | | Credits Assigned | | | |
|---|---|---|---|---|---|---|---|---|
| | | Theory | Practical | Tutorial | Theory | Practical & Oral | Tutorial | Total |
| ITL703 | Secure Application Development | -- | 2 | -- | -- | 1 | -- | 01 |

| Course Code | Course Name | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Theory Marks | | | | | | |
| | | Internal assessment | | | End Sem. Exam | Term Work | Practical/ Oral | Total |
| | | Test1 | Test 2 | Avg. of 2 Tests | | | | |
| ITL703 | Secure Application Development | -- | -- | -- | -- | 25 | 25 | 50 |

**Lab Objectives:**

| Sr. No | Lab Objectives |
|---|---|
| The Lab experiments aims: | |
| 1 | To understand the secure programming of application code. |
| 2 | To understand the Owasp methodologies and standards. |
| 3 | Understand and Identify main vulnerabilities inherent in applications. |
| 4 | Understand how Data Validation and Authentication can be applied for application. |
| 5 | Understand how to apply Security at Session Layer Management. |
| 6 | Understand how to apply to secure coding for cryptography. |

**Lab Outcomes:**

| Sr. No | Lab Outcomes | Cognitive levels of attainment as per Bloom's Taxonomy |
|---|---|---|
| On successful completion, of course, learner/student will be able to: | | |
| 1 | Apply secure programming of application code. | L1,L2,L3 |
| 2 | Understand the Owasp methodologies and standards. | L1,L2,L3 |
| 3 | Identify main vulnerabilities inherent in applications. | L1,L2,L3 |
| 4 | Apply Data Validation and Authentication for application | L1,L2,L3,L4,L5 |
| 5 | Apply Security at Session Layer Management | L1,L2,L3,L4,L5 |
| 6 | Apply secure coding for cryptography. | L1,L2,L3,L4,L5 |

**Hardware & Software requirements:**

| Hardware Specifications | Software Specifications |
|---|---|
| PC with following Configuration<br>1. Intel Core i3/i5/i7<br>2. 4 GB RAM<br>3. 500 GB Hard disk | Web Application, HTML5, CSS3, Java, C, Python, MySQL or Database Software.<br>Internet Connection, Browser, Security tools. SAST tools etc. |

**Prerequisite:** Knowledge of programming languages like java/python/C is required.

**DETAILED SYLLABUS:**

| Sr. No. | Module | Detailed Content | Hours | LO Mapping |
|---|---|---|---|---|
| 0 | Prerequisite | Programming Language and Web application basic concepts. | **02** | |
| I | Introduction to Secure Programming | Introduction to laws, standards and guidelines of cyber security. What do you mean by attacks, types of attacks and statistics of main vulnerabilities?<br><br>Lab1: Study of different laws and standards of cyber security. | **04** | LO1 |
| II | Methodologies for developing secure code | Software Development Lifecycle. Risk Analysis. Threat Modeling. Study different SAST (Static Application Security Testing) tools. Study different top 10 methodologies and guidelines of OWASP (Open Web Application Security Project) for the secure application development. Any top 5 OAT. Best eight guidelines for Secure Coding. Understand the flow of Verification testing for secure coding.<br><br>Lab2: Case study for SDLC.<br>Lab3: Exercise on Threat Modeling.<br>Lab4: Study of SAST Tools (open Source like GitHub, GitLab and so on) and use at least one for practical<br>Lab5: Study and implement at least any 5 methodologies of OWASP.<br>Lab6: Study and implement at least any 5 OAT Denial of Inventory for E-commerce Website.. | **06** | LO2 |
| III | VAPT of Applications | Introduction to the HTTP protocol. Owasp Web Security Testing Guidelines. Tools for VAPT testing.<br><br>Lab7: Use Burp proxy to test web applications. | **04** | LO3 |
| IV | Data Validation & Authentication | Guidelines for input data validation (Data type, Data size, Data range, Data Content etc.) and authentication for login page. Types of Authentication attacks. Study different type of | **05** | LO4 |

| | | | | |
|---|---|---|---|---|
| | | vulnerabilities like SQL Injection vulnerability, LDAP and XPath Injection vulnerabilities, Cross-Site Scripting (XSS) vulnerability, OS Command, LFI/RFI, Unvalidated file upload and buffer overflow etc.<br><br>Lab8: Registration Page Data Validation.<br>Lab9: SQL injection vulnerability allows login page to bypass.<br>Lab10: LDAP and XPath Injection vulnerabilities for login /registration page.<br>Lab11: Cross-Site Scripting (XSS) vulnerability Lab<br>Lab12: OS Command vulnerability Lab<br>Lab13: LFI/RFI or Unvalidated file upload or Buffer Overflow vulnerability Lab.<br>Lab14: Online Password attack. | | |
| V | Security in Session Layer | Introduction to Session Layer in Web Applications and management. Session Management Best practices according to OWASP.<br><br>Lab15: Session Management for Web Application. | **03** | LO5 |
| VI | Secure Coding for cryptography. | Overview of cryptography and guidelines for using encryption. Types of cryptography ie symmetric and asymmetric. Hashing Algorithms etc.<br><br>Lab16: Symmetric and Asymmetric<br>Lab17: Symmetric Encryption and Hashing. | **02** | LO6 |

**Text & References Books:**


1. Fundamental Practice for Secure Software Development.
2. The OWASP Automated Threat Handbook - Web Applications.
3. OWASP Alpha Release Code Review Guide 2.0
4. Secure Programming HOWTO
5. OWASP Quick reference guide 2.




**Online References:**

| Sr. No. | Website Links |
|---|---|
| 1 | https://www.udemy.com/course/secure-coding-secure-application-development/ |
| 2 | https://kirkpatrickprice.com/blog/secure-coding-best-practices/ |

| Course Code | Course Name | Teaching Scheme (Contact Hours) | | Credits Assigned | | |
|---|---|---|---|---|---|---|
| | | Theory | Practical | Theory | Practical | Total |
| ITC504 | Software Engineering | 03 | -- | 03 | -- | 03 |

| Course Code | Course Name | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Theory | | | | | Term Work | Pract/ Oral | Total |
| | | Internal Assessment | | | End Sem Exam | Exam Duration (in Hrs) | | | |
| | | Test1 | Test 2 | Avg. | | | | | |
| ITC504 | Software Engineering | 20 | 20 | 20 | 80 | 03 | -- | -- | 100 |

**Course Objectives:**

| Sr. No. | Course Objectives |
|---|---|
| The course aims: | |
| 1 | To provide the knowledge of software engineering discipline. |
| 2 | To understand Requirements and analyze it |
| 3 | To do planning and apply scheduling |
| 4 | To apply analysis, and develop software solutions |
| 5 | To demonstrate and evaluate real time projects with respect to software engineering principles |
| 6 | Apply testing and assure quality in software solution. |

**Course Outcomes:**

| Sr. No. | Course Outcomes | Cognitive levels of attainment as per Bloom's Taxonomy |
|---|---|---|
| On successful completion, of course, learner/student will be able to: | | |
| 1 | Understand and use basic knowledge in software engineering. | L1, L2 |
| 2 | Identify requirements, analyze and prepare models. | L1, L2, L3 |
| 3 | Plan, schedule and track the progress of the projects. | L1, L2, L3 |
| 4 | Design & develop the software solutions for the growth of society. | L1, L2, L3 |
| 5 | To demonstrate and evaluate real time projects with respect to software engineering principles | L1, L2, L3, L4 |
| 6 | Apply testing and assure quality in software solution | L1, L2, L3, L4 |

**Prerequisite:** Basic programming of knowledge.

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Research.

**DETAILED SYLLABUS:**

| Sr. No. | Module | Detailed Content | Hours | CO Mapping |
|---|---|---|---|---|
| 0 | Prerequisite | None | -- | -- |
| I | Introduction to Software Engineering | Nature of Software, Software Engineering, Software Process, Capability Maturity Model (CMM)<br><br>Generic Process Model, Prescriptive Process Models: The Waterfall Model, V-model, Incremental Process Models, Evolutionary Process Models, Concurrent Models, Agile process, Agility Principles, Extreme Programming (XP), Scrum, Kanban model<br><br>**Self-learning Topics:** Personal and Team Process Models | **06** | CO1,CO2 |
| II | Requirement Analysis | Software Requirements: Functional & non-functional – user-system requirement engineering process – feasibility studies – elicitation – validation & management – software prototyping – S/W documentation – Analysis and modelling<br><br>Requirement Elicitation, Software requirement specification (SRS),<br><br>**Self-learning Topics:** prioritizing requirements (Kano diagram) - real life application case study. | **07** | CO1,CO2 |
| III | Software Estimation and Scheduling | Management Spectrum, 3Ps (people, product and process)<br><br>Process and Project metrics<br><br>Software Project Estimation: LOC, FP, Empirical Estimation Models - COCOMO II Model, Specialized Estimation Techniques, Object based estimation, use-case based estimation<br><br>Project scheduling: Defining a Task Set for the Software Project, Timeline charts, Tracking the Schedule, Earned Value Analysis<br><br>**Self-learning Topics:** Cost Estimation Tools and Techniques, Typical Problems with IT Cost Estimates. | **06** | CO3 |
| IV | Design Engineering | Design Process & quality, Design Concepts, The design Model, Pattern-based Software Design. 4.2 Architectural Design :Design Decisions, Views, Patterns, Application Architectures, Modeling<br><br>Component level Design: component, Designing class based components, conducting component-level design,<br><br>User Interface Design: The golden rules, Interface Design | **07** | CO3, CO4 |

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| | | | | |
|---|---|---|---|---|
| | | steps & Analysis, Design Evaluation<br><br>**Self-learning Topics:** Refinement, Aspects, Refactoring | | |
| V | Software Risk, Configuration Management | Risk Identification, Risk Assessment, Risk Projection, RMMM<br><br>Software Configuration management, SCM repositories, SCM process<br><br>Software Quality Assurance Task and Plan, Metrics, Software Reliability, Formal Technical Review (FTR), Walkthrough<br><br>**Self-learning Topics:**: Configuration management for WebApps | **07** | CO5 |
| VI | Software Testing and Maintenance | Testing: Software Quality, Testing: Strategic Approach, Strategic Issues- Testing: Strategies for Conventional Software, Object oriented software, Web Apps- Validating Testing- System Testing- Art of Debugging.<br><br>Maintenance : Software Maintenance-Software Supportability- Reengineering- Business Process Reengineering- Software Reengineering- Reverse Engineering- Restructuring- Forward Engineering<br><br>**Self-learning Topics:** Test Strategies for WebApps | **06** | CO6 |

**Text Books:**


**1** Roger S. Pressman, Software Engineering: A practitioner's approach, McGraw Hill
**2** Rajib Mall, Fundamentals of Software Engineering, Prentice Hall India
**3** PankajJalote, An integrated approach to Software Engineering, Springer/Narosa.
**4** Ian Sommerville, Software Engineering, Addison-Wesley.


**References:**


1 https://nptel.ac.in/courses/106/101/106101061/
2 https://www.youtube.com/watch?v=wEr6mwquPLY
3 http://www.nptelvideos.com/video.php?id=911&c=9
4 https://onlinecourses.nptel.ac.in/noc19_cs70/unit?unit=25&lesson=66
5 https://onlinecourses.nptel.ac.in/noc19_cs70/unit?unit=25&lesson=67
6 https://onlinecourses.nptel.ac.in/noc19_cs70/unit?unit=25&lesson=65
7 https://onlinecourses.nptel.ac.in/noc19_cs70/unit?unit=25&lesson=64
8 https://onlinecourses.nptel.ac.in/noc19_cs70/unit?unit=25&lesson=63


Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

**Preferable**: Case studies can be discussed on every unit as per requirement for better understanding, examples are given below.

| | |
|---|---|
| Unit 1 | An information system (mental health-care system), wilderness weather system. |
| Unit 2 | Mental health care patient management system (MHC-PMS). |
| Unit 3 | Software Tools for Estimation. |

| Course Code | Course Name | Teaching Scheme (Contact Hours) | | | Credits Assigned | | | |
|---|---|---|---|---|---|---|---|---|
| | | Theory | Practical | Tutorial | Theory | Practical | Tutorial | Total |
| ITM301 | Mini Project – 1 A for Front end /backend Application using JAVA | -- | 04 | -- | -- | 02 | -- | 02 |

| Course Code | Course Name | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Theory Marks | | | | Term Work | Pract. /Oral | Total |
| | | Internal assessment | | | End Sem. Exam | | | |
| | | Test1 | Test 2 | Avg. | | | | |
| ITM301 | Mini Project – 1 A for Front end /backend Application using JAVA | -- | -- | -- | -- | 25 | 25 | 50 |

## Course Objectives

1. To acquaint with the process of identifying the needs and converting it into the problem.
2. To familiarize the process of solving the problem in a group.
3. To acquaint with the process of applying basic engineering fundamentals to attempt solutions to the problems.
4. To inculcate the process of self-learning and research.

## Course Outcome: Learner will be able to…

1. Identify problems based on societal /research needs.
2. Apply Knowledge and skill to solve societal problems in a group.
3. Develop interpersonal skills to work as member of a group or leader.
4. Draw the proper inferences from available results through theoretical/ experimental/simulations.
5. Analyse the impact of solutions in societal and environmental context for sustainable development.
6. Use standard norms of engineering practices
7. Excel in written and oral communication.
8. Demonstrate capabilities of self-learning in a group, which leads to life long learning.
9. Demonstrate project management principles during project work.

## Guidelines for Mini Project

- Students shall form a group of 3 to 4 students, while forming a group shall not be allowed less than three or more than four students, as it is a group activity.
- Students should do survey and identify needs, which shall be converted into problem statement for mini project in consultation with faculty supervisor/head of department/internal committee of faculties.
- Students hall submit implementation plan in the form of Gantt/PERT/CPM chart, which will cover weekly activity of mini project.
- A log book to be prepared by each group, wherein group can record weekly work progress, guide/supervisor can verify and record notes/comments.
- Faculty supervisor may give inputs to students during mini project activity; however, focus shall be on self-learning.

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

- Students in a group shall understand problem effectively, propose multiple solution and select best possible solution in consultation with guide/ supervisor.
- Students shall convert the best solution into working model using various components of their domain areas and demonstrate.
- The solution to be validated with proper justification and report to be compiled in standard format of University of Mumbai.
- With the focus on the self-learning, innovation, addressing societal problems and entrepreneurship quality development within the students through the Mini Projects, it is preferable that a single project of appropriate level and quality to be carried out in two semesters by all the groups of the students. i.e. Mini Project 1 in semester III and IV. Similarly, Mini Project 2 in semesters V and VI.
- However, based on the individual students or group capability, with the mentor's recommendations, if the proposed Mini Project adhering to the qualitative aspects mentioned above gets completed in odd semester, then that group can be allowed to work on the extension of the Mini Project with suitable improvements/modifications or a completely new project idea in even semester. This policy can be adopted on case by case basis.

## Guidelines for Assessment of Mini Project:

### Term Work

- The review/ progress monitoring committee shall be constituted by head of departments of each institute. The progress of mini project to be evaluated on continuous basis, minimum two reviews in each semester.
- In continuous assessment focus shall also be on each individual student, assessment based on individual's contribution in group activity, their understanding and response to questions.
- Distribution of Term work marks for both semesters shall be as below;
    - Marks awarded by guide/supervisor based on log book : 10
    - Marks awarded by review committee : 10
    - Quality of Project report : 05

**Review/progress monitoring committee may consider following points for assessment based on either one year or half year project as mentioned in general guidelines.**

### One-year project:

- In first semester entire theoretical solution shall be ready, including components/system selection and cost analysis. Two reviews will be conducted based on presentation given by students group.
    - First shall be for finalisation of problem
    - Second shall be on finalisation of proposed solution of problem.
- In second semester expected work shall be procurement of component's/systems, building of working prototype, testing and validation of results based on work completed in an earlier semester.
    - First review is based on readiness of building working prototype to be conducted.
    - Second review shall be based on poster presentation cum demonstration of working model in last month of the said semester.

### Half-year project:

- In this case in one semester students' group shall complete project in all aspects including,
    - Identification of need/problem
    - Proposed final solution
    - Procurement of components/systems
    - Building prototype and testing
- Two reviews will be conducted for continuous assessment,
    - First shall be for finalisation of problem and proposed solution
    - Second shall be for implementation and testing of solution.

## Assessment criteria of Mini Project.

**Mini Project** shall be assessed based on following criteria;

1. Quality of survey/ need identification
2. Clarity of Problem definition based on need.
3. Innovativeness in solutions
4. Feasibility of proposed problem solutions and selection of best solution
5. Cost effectiveness
6. Societal impact
7. Innovativeness
8. Cost effectiveness and Societal impact
9. Full functioning of working model as per stated requirements
10. Effective use of skill sets
11. Effective use of standard engineering norms
12. Contribution of an individual's as member or leader
13. Clarity in written and oral communication

- In **one year, project**, first semester evaluation may be based on first six criteria's and remaining may be used for second semester evaluation of performance of students in mini project.
- In case of **half year project** all criteria's in generic may be considered for evaluation of performance of students in mini project.

## Guidelines for Assessment of Mini Project Practical/Oral Examination:

- Report should be prepared as per the guidelines issued by the University of Mumbai.
- Mini Project shall be assessed through a presentation and demonstration of working model by the student project group to a panel of Internal and External Examiners preferably from industry or research organisations having experience of more than five years approved by head of Institution.
- Students shall be motivated to publish a paper based on the work in Conferences/students competitions.

**Mini Project** shall be assessed based on following points;

1. Quality of problem and Clarity
2. Innovativeness in solutions
3. Cost effectiveness and Societal impact
4. Full functioning of working model as per stated requirements
5. Effective use of skill sets
6. Effective use of standard engineering norms
7. Contribution of an individual's as member or leader
8. Clarity in written and oral communication


**Dr. Vilas N. Nitnaware**
**Principal**
**K.C. College of Engineering & Management Studies & Research.**

| | | | | | |
|---|---|---|---|---|---|
| **Semester** | : | **III Core** | | | |
| **Title of the Subject / course** | : | **Materials Management** | | | |
| **Course Code** | : | | | | |
| **Credits** | : | **4** | **Duration** | : | **40** |

| **Learning Objectives** | |
|---|---|
| 1 | Importance of Materials Management w.r.t. Business |
| 2 | Learning various aspects of Purchase & warehousing |
| 3 | Understanding documents control w.r.t. Material movement |
| 4 | Materials planning with quantitative models |
| 5 | Financial aspects of Materials Management |
| 6 | Importance of Ethics in Materials Management |

| | |
|---|---|
| **Prerequisites if any** | Operations Management, Operations Research |
| **Connections with Subjects in the current or Future courses** | Supply Chain Management, MRPC |

**Module**

| Sr. No. | Content | Activity | Learning outcomes |
|---|---|---|---|
| 1 | Materials Management an overview<br>a) Introduction,<br>b) Importance of Materials Management<br>c) Objectives of Materials Management<br>d) Costs involved in the Management of Materials e) Integrated approach to Materials Management<br>f) Organizing Materials Management.<br>g) Organization based on Commodities/Location/function<br>h) Centralized versus Decentralized materials management. | Lecture | Preparation for the course in respect Operations as well as Organization |
| 2 | Materials Planning<br>a) Introduction and factors influencing materials planning b) Techniques of materials planning<br>c) Bill-of-Materials<br>d) Materials Requirement Planning (MRP).<br>e) Past Consumption Analysis Technique | Lecture/ Discussion/ Problems from Industry using computers | Planning with financial perspective<br>Understanding impact of MRP on financial statements |
| 3 | Purchasing<br>a) Purchasing principles, policies, procedures and practices<br>b) Objectives, scope, responsibility and limitations<br>c) Sources of supply and Supplier selection. | Lecture/ Industrial examples/ Problems | Overview of Purchasing activities |

| Sr. No. | Content | Activity | Learning outcomes |
|---|---|---|---|
| | d) Vendor development-evaluation and rating.<br>e) Price forecasting<br>f) Price-cost analysis<br>g) Negotiations<br>h) Reciprocity<br>i) Legal aspects of purchasing<br>j) Purchase orders/ contracts<br>k) Method of buying- under certainty, under risk, and under uncertainty | | |
| 4 | Purchasing and Procurement Activities under Materials Management.<br>a) Supplier Quality Assurance Programme<br>b) Buyer Supplier Relationship<br>c) Self certified suppliers.<br>d) Elements of procurement cycle. | Lecture/ Examples of supplier audits/ Example of procurement cycle | Detailed understanding of Purchase Process |
| 5 | Purchasing of Capital Equipment<br>a) Significant differences<br>b) Considerations in evaluation of bids<br>c) Purchase of used equipment<br>d) Sources of used equipments<br>e) Purchase versus lease.<br>f) Role of Purchasing Committees/ Purchase Managers | Lecture with examples from Industry | Basic understanding of purchase of projects |
| 6 | International procurement-Imports.<br>a) International commercial terms.<br>b) Import procedures and documentation.<br>c) Categories of importers.<br>d) Identification of foreign sources.<br>e) Payment terms including Letter of credit.<br>f) Types of L/Cs.<br>g) Custom tariff<br>h) Custom clearance.<br>i) Bill of Lading and other documents | Lecture with display of relevant documents | Basic introduction to imports |
| 7 | Classification of Materials<br>a) Introduction and objectives of classification.<br>b) Basis of classification.<br>c) Classification on the basis of nature of materials.<br>d) Classification on the basis of usability of materials.<br>f) Types of inventories. | Lecture with industrial examples/ ABC analysis problem on excel sheet with at least 20 materials | To understand how industry give selective importance to specific materials |
| 8 | Materials receipt and Warehousing<br>a) Introduction and functions of | Lecture with development | Understanding the controls over materials |

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| Sr. No. | Content | Activity | Learning outcomes |
|---|---|---|---|
| | scientific store management.<br>b) Types of stores and benefits of scientific storekeeping.<br>c) Store location and layout.<br>d) Typical layout plans<br>e) Storing practices and identification of materials.<br>f) Centralization and Decentralization of stores.<br>g) Preservation of materials<br>h) Issue control. | of relevant documents in the class by students | |
| 9 | Codification<br>a) Introduction<br>b) Benefits of codification.<br>c) Stages of scientific codification.<br>d) Systems of codification.<br>e) Colour coding | Lecture with day to day examples from student's presentation | Understanding the impact codification on computerization & decision making |
| 10 | Standardization<br>a) Introduction and different levels of standards (BIS,ISI)<br>b) Various Foreign Standards in use in India.<br>c) How is an Indian standard evolved?<br>d) Advantages of Standardization.<br>e) Standardization as a tool for variety reduction<br>f) The Role of Materials Management (Purchase/Stores) in Standardization/ Variety Reduction. | Lecture & student presentation with examples | Importance of standardization |
| 11 | Obsolete, Surplus and Scrap Management<br>a) Definition<br>b) Need for Scrap yard<br>c) Identification and control.<br>d) Categorization of obsolete/ surplus.<br>e) Control of scrap/ obsolescence.<br>f) Responsibility for disposal.<br>g) Procedures and documentation for disposal of scrap/ obsolete/ surplus. | Lecture with industrial examples of Issues arising out of scrap | Understanding the processes & financial impacts |
| 12 | Stores Accounting and Stock verification<br>a) Costing of Receipt of Materials.<br>b) Costing of Issues to Production.<br>c) Stock verification<br>d) Periodic Verification.<br>e) Perpetual Verification.<br>f) Process of Verification | Lecture with stock taking activity in the class of the class | Learning the industry process & its financial impacts |
| 13 | Ethics in Materials Management | Lecture with | Importance of Ethics in |

Dr. Viles N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

K.C. College of Engg. and Management Studies & Research ★ THANE (E)

| Sr. No. | Content | Activity | Learning outcomes |
|---|---|---|---|
| | a) Importance of Ethics<br>b) Business Ethics<br>c) Ethics in buying<br>d) Code of ethics<br>e) Problems in Ethics<br>f) Backdoor selling | examples | Materials Management |
| 14 | Material Handling<br>a)20 Principles of Material Handling<br>b)Palletisation c)Containerization<br>d)Transportation Modes / Attributes<br>e)Transportation mix in Economy<br>f)Total cost concept in Material Handling and Transportation | Lecture | Basic introduction to Materials handling |

| **Text books** | | |
|---|---|---|
| 1 | Purchasing and Materials Management | P.Gopalkrishnan (Tata McGraw Hill, New Delhi). |
| 2 | Materials Management –An integrated approach | P.Gopalkrishnan and M. Sundaresan (Prentice-Hall India, New Delhi). |
| 3 | Purchasing Management | Datta |
| 4 | Purchasing Management | Nair |
| | | |
| **Reference books** | | |
| 1 | Materials and Logistics Management | Prof. L.C. Jhamb (Everest Publishing House, Pune). |
| 2 | Introduction to Materials Management | JR Tony Arnold and Stephan Chapman (Pearson Education, New Delhi) 2004 Fifth Edition. |
| 3 | Purchasing and Materials Management | N.K.Nair (Vikas Publishing House, New Delhi). |

| **Assessment** | |
|---|---|
| Internal | 40% or 25 % |
| Semester end | 60% or 75 % |


Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

**Programme - Masters in Management Studies**

**Semester - III**

**OPERATIONS (CORE)**

| | | | | | |
|---|---|---|---|---|---|
| **Semester** | : | **III Core** | | | |
| **Title of the Subject / course** | : | **Supply Chain Management** | | | |
| **Course Code** | : | | | | |
| **Credits** | : | **4** | **Duration** | : | **40** |

| **Learning Objectives** | |
|---|---|
| 1 | Familiarize with the basic concepts of Logistics Management in relation to Inbound Logistics, Process Logistics, and Outbound Logistics phases of business. |
| 2 | To explore the major elements of supply chain and expose to leading edge thinking on supply chain strategy, Designing supply chain, customer satisfaction; inventory management; risk management, alliances, issues and challenges, performance measurement. |
| | |
| **Prerequisites if any** | |
| **Connections with Subjects in the current or Future courses** | International Logistics |

**Module**

| S No | Content | Activity | Learning outcomes |
|---|---|---|---|
| 1 | **Understanding the supply chain**<br>What is a supply chain? Decision phases in a supply chain.<br>Evolution of SCM, SCM integration, Linkages and Decisions in SCM.<br>Difference of Supply Chains in Product (Mfg.)<br>Industry and Service-based Industry.<br>Supply Chain and Demand chain, Value creation.<br>Delivery and Value addition through supply chain.<br>Process view of a supply chain. The importance of supply chain flows.<br>Competitive Supply Chain Strategies.<br>Achieving strategic fit. | Lecture and discussion. | Understanding of Supply chain |
| 2 | **Logistics**<br>Competitive advantage and three C, Competitive advantage through logistics.<br>Logistics-A system concept, Customer value chain, Logistics functions.<br>Logistics Mission, Objectives, Goals, Decisions. Reverse Logistics. | Lecture and discussion. | Understanding of Logistics concept |
| 3 | **Warehousing and Distribution**<br>Role of warehouse in Logistics, | Lecture and discussion. | Understanding of Warehousing function |

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

K.C. College of Engg. and Management Studies and Research THANE (E)

| S No | Content | Activity | Learning outcomes |
|---|---|---|---|
| | Warehousing functions, Types of warehouses<br>Warehouse site selection, Layout design, Warehouse Decision model.<br>Warehouse automation, strategies, performance, costing.<br>Distribution, Role, Importance, Levels, Channels, Structure, Functions.<br>Channel partners, functions, Tasks, Flows, Strategy.<br>Free trade zones and special economic zones. | | and distribution channel |
| 4 | **Order Processing and Logistics Information system**<br>Order Preparation, Transmittal, Order entry, Order filling, Order status reporting<br>Industrial order processing and Retail order processing.<br>Web based order processing. Processing priorities. | Lecture and discussion. | Understanding of Warehouse process and logistics information system |
| 5 | **Performance Measurement and Controls in Supply Chain Management**<br>Pre- transaction, Transaction, Post-transaction elements, Service attributes<br>Value added customer service, Importance of Logistics Customer service<br>Sales and Service relationship, Cost and Service relationship.<br>Objective, Levels, Parameters of performance measures- Cycle time, Fill Rate.<br>Inventory Turnover, On-time Shipping and Delivery, Perfect Order, Stock out.<br>Transportation measurements, Customer perception measure, Audit.<br>Gap Analysis<br>Concept of Benchmarking<br>Benchmarking for Best Practices<br>SCOR and DCOR | Lecture and discussion. | Understanding of customer service and performance measurement |
| 6 | **Transportation**<br>Infrastructure, road, rail, air water, pipeline. Freight Management, Freight cost.<br>Transportation Network Route planning, Containerization, Packing.<br>Effective / Cost Optimizing Distribution strategies- Direct shipment, Cross-docking, Milk run, transshipment. | Lecture and discussion. | Understanding of Transportation modes |


Dr. Vilas N. Nimaware
P
K.C. College ing &
Management & Research.

| S No | Content | Activity | Learning outcomes |
|---|---|---|---|
| 7 | **Designing Logistics and distribution network in a supply chain**<br>**Applications to Online Sales**<br>**Network Design in the SC**<br>the role of distribution in the supply chain.<br>Importance of Smart Transportation Distribution Center Concept , Modern DC's , Robotics Usage for pick and pack<br>Factors influencing distribution network design.<br>**Supply Chain Integration**<br>Design option for a distribution network.<br>Distribution network in practice. | Lecture and discussion. | Understanding various distribution networks |
| 8 | **The value of Information**<br>Bullwhip effect. Effective forecasts.<br>Information for the coordination of systems.<br>Collaborative Planning Forecasting Replenishment (CPRF) concept.<br>Locating desired products. Lead time reduction.<br>Information and supply chain trade-off.<br>Designing the supply chain for conflicting goals.<br>**Inventory Management and Risk pooling, Logistics Information system**<br>Function, OMS, WMS, TMS.<br>Internal Operations – Input, Database management, Output | Lecture and discussion. | Understanding importance of information in supply chain. |
| 9 | **Strategic Alliances**<br>A framework for strategic alliances. Third party / fourth party logistics.<br>What are 3PL/4PL, Advantages and disadvantages of 3PL, 3PL issues and requirements?<br>Retailer supplier partnership. Types of RSP, Requirements of RSP<br>Inventory ownership in RSP, Issues and steps in RSP implementation<br>Advantages and disadvantages of RSP.<br>Distribution Integration<br>Types of and issues in Distribution integration.<br>**Customer Value** | Lecture and discussion. | Understanding of various outsourcing activities and RSP |
| 10 | **E-procurement and outsourcing**<br>Outsourcing benefits and risks. A framework for Buy/Make decisions.<br>E-procurement. A framework of E- | Lecture and discussion. | Understanding procurement through Internet and impact. |

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| S No | Content | Activity | Learning outcomes |
|---|---|---|---|
| | procurement.<br>Impact of Internet on supply chain strategies (E-business). | | |
| 11 | **Designing Global Supply Chain Networks**<br>Global market / Technological/ Cost/ Political and Economic Forces.<br>Risks and advantages of international supply chain.<br>International versus Regional products.<br>Local autonomy versus central control.<br>Regional differences in Logistics- Cultural differences/ infrastructure/ performance expectation and evaluation<br>Information systems availability, human resources. Global business logistics. | Lecture and discussion. | Understanding various international issues and challenges |
| 12 | **Performance Measurement and Controls in Supply Chain Management**<br>Measurement of a Robust Supply Chain.<br>Cost / Quality / Service Measurement<br>Introduction and concept of Benchmarking. Gap Analysis.<br>Key actions in benchmarking for best practices.<br>Overview of Supply Chain Operations Reference (SCOR) Modeling.<br>Balance scorecard for SCM.<br>**Lean Manufacturing and Mass Customisation** | Lecture and discussion. | Understanding various performance measurements tools in supply chain. |
| 13 | **Ethical issues in SCM**<br>Supply chain vulnerability.<br>Conformance to applicable laws such as Contract and commercial laws,<br>Trade regulation, government procurement regulations, patents<br>Copyrights, trademark laws, transportation and logistics laws and regulations<br>Environmental laws. International practices. Confidentiality and proprietary information. | Lecture and discussion. | Understanding various ethics, Rules and regulations in supply chain. |
| 14 | **Current Trends in Supply Chain**<br>Goldratt Supply Chains<br>Sustainable Supply Chain<br>Resilient supply chains<br>Green Supply chain<br>Lean supply chain | Lecture and discussion. | Understanding recent trends in supply chain. |


Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| Text books | | |
|---|---|---|
| 1 | Supply Chain Management - Strategy, Planning and Operation | Sunil Chopra and Peter Meindl |
| 2 | Supply Chain Management by | Simchi Levi |

| Reference books | | |
|---|---|---|
| 1 | Logistics Management | V.V.Sople |
| 2 | Supply Chian Management | V.V.Sople |
| 3 | Business Logistics | Ronald H.Ballou |
| 4 | Logistics and Supply Chain Management | Martin Christopher |
| 6 | Designing & Managing the supply chain | David, Philip Kminsky |

| Assessment | |
|---|---|
| Internal | 40% |
| Semester end | 60% |

**PROGRAM : MMS**

| | | | | | |
|---|---|---|---|---|---|
| **Semester** | : | **II** | | | |
| **Title of the Subject / course** | : | **Business Research Methods** | | | |
| **Course Code** | : | | | | |
| **Credits** | : | **4** | **Duration in Hrs** | : | **40** |

**Learning Objectives**

| | |
|---|---|
| 1 | To understand the importance of research and various methods that researcher used to investigate problems |
| 2 | Applying Modern Analytical tools for Business Management Decisions |
| 3 | To derive strategies from the research |
| 4 | To understand the challenges in collecting the data collection and analysis |
| 5 | To interpret the data to make meaningful decisions. |

| | |
|---|---|
| **Prerequisites if any** | |
| **Connections with Subjects in the current or Future courses** | |

**Module**

| Sr. No. | Content | Activity | Learning outcomes |
|---|---|---|---|
| 1 | Introduction to Research | Lecture | Meaning of research; Types of research- Exploratory research, Conclusive research; The process of research; Research applications in social and business sciences; Features of a Good research study. |
| 2 | Research Problem and Formulation of Research Hypotheses | Lecture | Defining the Research problem; Management Decision Problem vs Management Research Problem; Problem identification process; Components of the research problem; Formulating the research hypothesis- Types of Research hypothesis; Writing a research proposal- Contents of a research proposal and types of research proposals. |
| 3 | Research Design | Lecture | Meaning of Research Designs; Nature and Classification of Research Designs; Exploratory Research Designs: Secondary Resource analysis, Case study Method, Expert opinion survey, Focus group discussions; Descriptive Research Designs: Cross-sectional studies and Longitudinal studies; Experimental Designs, Errors affecting Research Design |
| 4 | Primary and Secondary Data | Field Work | Classification of Data; Secondary Data: Uses, Advantages, Disadvantages, Types and sources; Primary Data Collection: Observation method, Focus Group Discussion, Personal Interview method |

K.C. College of Engg. and Management Studies and Research THANE (E)

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering &
Manage... Studies ... rch.

| PROGRAM : MMS<br>No. | Content | Activity | Learning outcomes |
|---|---|---|---|
| 5 | Attitude Measurement and Scaling | Lecture | Types of Measurement Scales; Attitude; Classification of Scales: Single item vs Multiple Item scale, Comparative vs Non-Comparative scales, Measurement Error, Criteria for Good Measurement |
| 6 | Questionnaire Design | Lecture | Questionnaire method; Types of Questionnaires; Process of Questionnaire Designing; Advantages and Disadvantages of Questionnaire Method |
| 7 | Sampling and Data Processing | Case Study and SPSS / Excel | Sampling concepts- Sample vs Census, Sampling vs Non Sampling error; Sampling Design- Probability and Non Probability Sampling design; Determination of Sample size- Sample size for estimating population mean, Determination of sample size for estimating the population proportion<br>Data Editing- Field Editing, Centralized in house editing; Coding- Coding Closed ended structured Questions, Coding open ended structured Questions; Classification and Tabulation of Data. |
| 8 | Univariate and Bivariate Analysis of Data | SPSS Lab / Excel | Descriptive vs Inferential Analysis, Descriptive Analysis of Univariate data- Analysis of Nominal scale data with only one possible response, Analysis of Nominal scale data with multiple category responses, Analysis of Ordinal Scaled Questions, Measures of Central Tendency, Measures of Dispersion; Descriptive Analysis of Bivariate data |
| 9 | Testing of Hypotheses | Analyzing Primary Data | Concepts in Testing of Hypothesis – Steps in testing of hypothesis, Test Statistic for testing hypothesis about population mean; Tests concerning Means- the case of single population; Tests for Difference between two population means; Tests concerning population proportion- the case of single population; Tests for difference between two population proportions. |
| 10 | Chi-square Analysis | Analyzing Primary Data | Chi square test for the Goodness of Fit; Chi square test for the independence of variables; Chi square test for the equality of more than two population proportions |
| 11 | Analysis of Variance | Lecture and Analyzing Primary Data | Completely randomized design in a one-way ANOVA; Randomized block design in two way ANOVA; Factorial design |
| 12 | Research Report Writing and Ethics in research | Lecture | Types of research reports – Brief reports and Detailed reports; Report writing: Structure of the research report- Preliminary section, Main report, Interpretations of Results and |

| Sr. No. | Content | Activity | Learning outcomes |
|---|---|---|---|
| | | | Suggested Recommendations; Report writing: Formulation rules for writing the report: Guidelines for presenting tabular data, Guidelines for visual Representations. Meaning of Research Ethics; Clients Ethical code; Researchers Ethical code; Ethical Codes related to respondents; Responsibility of ethics in research |
| 13 | Presentation / Report | PowerPoint | |

**Text books**

| | |
|---|---|
| 1 | Business Research Methods – Cooper Schindler |
| 2 | Research Methodology Methods & Techniques – C.R.Kothari |
| 3 | Statistics for Management – Richard L Levin |

**Reference books**

| | |
|---|---|
| 1 | D. K. Bhattacharya: Research Methodology (Excel) |
| 2 | P. C. Tripathy: A text book of Research Methodology in Social Science(Sultan Chand) |
| 3 | Saunder: Research Methods for business students (Pearson) |
| 4 | Marketing Research –Hair, Bush, Ortinau (2nd edition Tata McGraw Hill) |
| 5 | Business Research Methods – Alan Bryman& Emma Bell – Oxford Publications |
| 6 | Business Research Methods – Naval Bajpai – Pearson Publications |

**Assessment**

| | |
|---|---|
| Internal | 40% |
| Semester end | 60% |

K.C. College of Engg. and Management Studies and Research * THANE (E)

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marksQ.1** will be **compulsory** and should **cover maximum contents of the syllabus**
- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)
- A total of **four questions** need to be answered

| Course Code | Course Name | Teaching Scheme (Contact Hours) | | Credits Assigned | | |
|---|---|---|---|---|---|---|
| | | Theory | Practical | Theory | Practical | Total |
| ITDO6013 | Green IT | 03 | -- | 03 | -- | 03 |

| Course Code | Course Name | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Theory Marks | | | | Term Work | Practical | Oral | Total |
| | | Internal assessment | | | End Sem. Exam | | | | |
| | | Test1 | Test 2 | Avg. | | | | | |
| ITDO6013 | Green IT | 20 | 20 | 20 | 80 | -- | -- | -- | 100 |

**Course Objectives:**

| Sr. No. | Course Objectives |
|---|---|
| The course aims: | |
| 1 | To understand what Green IT is and How it can help improve environmental Sustainability |
| 2 | To understand the principles and practices of Green IT. |
| 3 | To understand how Green IT is adopted or deployed in enterprises. |
| 4 | To understand how data centres, cloud computing, storage systems, software and networks can be made greener. |
| 5 | To measure the Maturity of Sustainable ICT world. |
| 6 | To implement the concept of Green IT in Information Assurance in Communication and Social Media and all other commercial field. |

**Course Outcomes:**

| Sr. No. | Course Outcomes | Cognitive levels of attainment as per Bloom's Taxonomy |
|---|---|---|
| On successful completion, of course, learner/student will be able to: | | |

K.C. College of Engg. and Management Studies and Research THANE

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| | | |
|---|---|---|
| 1 | Describe awareness among stakeholders and promote green agenda and green initiatives in their working environments leading to green movement | L1 |
| 2 | Identify IT Infrastructure Management and Green Data Centre Metrics for software development | L1,L2 |
| **3** | Recognize Objectives of Green Network Protocols for Data communication. | L1,L2 |
| **4** | Use Green IT Strategies and metrics for ICT development. | L1,L2,L3 |
| **5** | Illustrate various green IT services and its roles. | L1,L2 |
| **6** | Use new career opportunities available in IT profession, audits and others with special skills such as energy efficiency, ethical IT assets disposal, carbon footprint estimation, reporting and development of green products, applications and services. | L1,L2,L3 |

**Prerequisite:** Environmental Studies

**DETAILED SYLLABUS:**

| Sr. No. | Module | Detailed Content | Hours | CO Mapping |
|---|---|---|---|---|
| 0 | Prerequisite | Environmental Studies | 2 | |
| I | Introduction | Environmental Impacts of IT, Holistic Approach to Greening IT, Green IT Standards and Eco-Labeling, Enterprise Green IT Strategy<br>**Hardware:** Life Cycle of a Device or Hardware, Reuse, Recycle and Dispose<br>**Software:** Introduction, Energy-Saving Software Techniques<br>**Self learning Topics:** Evaluating and Measuring Software Impact to Platform Power | 7 | CO 1 |
| II | Software development and data centers | Sustainable Software, Software Sustainability Attributes, Software Sustainability Metrics<br>Data Centres and Associated Energy Challenges, Data Centre IT Infrastructure, Data Centre Facility Infrastructure: Implications for Energy Efficiency, Green Data Centre Metrics<br>**Self-learning Topics:** Sustainable Software: A Case Study, Data Centre Management Strategies: A Case Study | 7 | CO 1<br>CO 2 |
| III | Data storage and communication | Storage Media Power Characteristics, Energy Management Techniques for Hard Disks<br>Objectives of Green Network Protocols, Green Network Protocols and Standards<br>**Self learning Topics:** System-Level Energy Management | 6 | CO 1<br>CO 3 |
| IV | Information systems, green it strategy and metrics | Approaching Green IT Strategies, Business Drivers of Green IT Strategy<br>Multilevel Sustainable Information, | 6 | CO 1<br>CO 4 |

| | | | | |
|---|---|---|---|---|
| | | Sustainability Hierarchy Models, Product Level Information, Individual Level Information, Functional Level Information, Measuring the Maturity of Sustainable ICT: A Capability Maturity Framework for SICT, Defining the Scope and Goal, Capability Maturity Levels<br><br>**Self learning Topics:** Business Dimensions for Green IT Transformation | | |
| V | Green IT services and roles | Factors Driving the Development of Sustainable IT, Sustainable IT Services (SITS), SITS Strategic Framework Organizational and Enterprise Greening, Information Systems in Greening Enterprises, Greening the Enterprise: IT Usage and Hardware<br><br>**Self learning Topics:** Inter-organizational Enterprise Activities and Green Issues, Enablers and Making the Case for IT and the Green Enterprise | 6 | CO 1<br>CO 4<br>CO 5 |
| VI | Managing and regulating green IT | Strategizing Green Initiatives, Implementation of Green IT, Communication and Social Media<br>The Regulatory Environment and IT Manufacturers, Nonregulatory Government Initiatives, Industry Associations and Standards Bodies, Green Building Standards, Social Movements and Greenpeace.<br><br>**Self learning Topics:** Information Assurance, Green Data Centers, Case Study: Managing Green IT | 5 | CO 1<br>CO 5<br>CO 6 |

**Text Books:**


1. San Murugesan, G. R. Gangadharan, Harnessing Green IT, WILEY 1st Edition-2013
2. Mohammad Dastbaz Colin Pattinson Babak Akhgar, Green Information Technology A Sustainable Approach, Elsevier 2015
3. Reinhold, Carol Baroudi, and Jeffrey HillGreen IT for Dummies, Wiley 2009


**References:**


1. Mark O'Neil, Green IT for Sustainable Business Practice: An ISEB Foundation Guide, BCS
2. Jae H. Kim, Myung J. Lee Green IT: Technologies and Applications, Springer, ISBN: 978-3-642-22178-1
3. Elizabeth Rogers, Thomas M. Kostigen The Green Book: The Everyday Guide to Saving the Planet One Simple Step at a Time, Springer


**Assessment:**

**Internal Assessment (IA) for 20 marks:**

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marks**. **Q.1** will be **compulsory** and should **cover maximum contents of the syllabus**
- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)
- A total of **four questions** need to be answered

| Course Code | Course Name | Credits |
|---|---|---|
| ILO8019 | Environmental Management | 03 |

**Objectives:**

1. Understand and identify environmental issues relevant to India and global concerns
2. Learn concepts of ecology
3. Familiarise environment related legislations

**Outcomes:** Learner will be able to…

1. Understand the concept of environmental management
2. Understand ecosystem and interdependence, food chain etc.
3. Understand and interpret environment related legislations

| Module | Detailed Contents | Hrs |
|---|---|---|
| 01 | Introduction and Definition of Environment; Significance of Environment Management for contemporary managers, Career opportunities.<br>Environmental issues relevant to India, Sustainable Development, The Energy scenario. | 10 |
| 02 | Global Environmental concerns : Global Warming, Acid Rain, Ozone Depletion, Hazardous Wastes, Endangered life-species, Loss of Biodiversity, Industrial/Man-made disasters, Atomic/Biomedical hazards, etc. | 06 |
| 03 | Concepts of Ecology: Ecosystems and interdependence between living organisms, habitats, limiting factors, carrying capacity, food chain, etc. | 05 |
| 04 | Scope of Environment Management, Role & functions of Government as a planning and regulating agency.<br>Environment Quality Management and Corporate Environmental Responsibility | 10 |
| 05 | Total Quality Environmental Management, ISO-14000, EMS certification | 05 |
| 06 | General overview of major legislations like Environment Protection Act, Air (P & CP) Act, Water (P & CP) Act, Wildlife Protection Act, Forest Act, Factories Act, etc. | 03 |



REFERENCES:


1. Environmental Management: Principles and Practice, C J Barrow, Routledge Publishers London, 1999
2. A Handbook of Environmental Management Edited by Jon C. Lovett and David G. Ockwell, Edward Elgar Publishing
3. Environmental Management,**T V Ramachandra and Vijay Kulkarni, TERI Press**
4. Indian Standard Environmental Management Systems — Requirements With Guidance For Use, Bureau Of Indian Standards, February 2005
5. Environmental Management: An Indian Perspective, S N Chary and Vinod Vyasulu, Machillan India, 2000

EXCELSSIOR EDUCATION SOCIETY'S
K. C. College of Engineering & Management Studies & Research
Mith Bunder Road, Kopri, Thane (E)

# 2. Courses integrate Environment and Sustainability

| Course Code | Course Name | Teaching Scheme (Contact Hours) | | | Credits Assigned | | | |
|---|---|---|---|---|---|---|---|---|
| | | Theory | Practical | Tutorial | Theory | Practical | Tutorial | Total |
| ILO 8019 | Environmental Management | 03 | -- | -- | 03 | -- | -- | 03 |

| Course Code | Course Name | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Theory Marks | | | | Exam Duration (Hrs.) | Term Work | Practical and Oral | Total |
| | | Internal Assessment | | | End Sem. Exam. | | | | |
| | | Test1 | Test2 | Avg. | | | | | |
| ILO 8019 | Environmental Management | 20 | 20 | 20 | 80 | 03 | -- | -- | 100 |

**Objectives:**

1. Understand and identify environmental issues relevant to India and global concerns
2. Learn concepts of ecology
3. Familiarise environment related legislations

**Outcomes:** Learner will be able to…

1. Understand the concept of environmental management
2. Understand ecosystem and interdependence, food chain etc.
3. Understand and interpret environment related legislations

| Module | Detailed Contents | Hrs |
|---|---|---|
| 01 | Introduction and Definition of Environment: Significance of Environment Management for contemporary managers, Career opportunities.<br>Environmental issues relevant to India, Sustainable Development, The Energy scenario. | 10 |
| 02 | Global Environmental concerns : Global Warming, Acid Rain, Ozone Depletion, Hazardous Wastes, Endangered life-species, Loss of Biodiversity, Industrial/Man-made disasters, Atomic/Biomedical hazards, etc. | 06 |
| 03 | Concepts of Ecology: Ecosystems and interdependence between living organisms, habitats, limiting factors, carrying capacity, food chain, etc. | 05 |
| 04 | Scope of Environment Management, Role & functions of Government as a planning and regulating agency.<br>Environment Quality Management and Corporate Environmental Responsibility | 10 |
| 05 | Total Quality Environmental Management, ISO-14000, EMS certification. | 05 |
| 06 | General overview of major legislations like Environment Protection Act, Air (P & CP) Act, Water (P & CP) Act, Wildlife Protection Act, Forest Act, Factories Act, etc. | 03 |
| | **Total** | 39 |

## Assessment:

**Internal:**
Assessment consists of two tests out of which; one should be compulsory class test and the other is either a class test or assignment on live problems or course project.

**End Semester Theory Examination:**
Some guidelines for setting up the question paper. Minimum 80% syllabus should be covered in question papers of end semester examination. **In question paper weightage of each module will be proportional to number of respective lecture hours as mention in the syllabus.**

1. Question paper will comprise of total six question
2. All question carry equal marks
3. Questions will be mixed in nature (for example supposed Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3)
4. Only Four question need to be solved.

**REFERENCES:**


1. Environmental Management: Principles and Practice, C J Barrow, Routledge Publishers London, 1999
2. A Handbook of Environmental Management Edited by Jon C. Lovett and David G. Ockwell, Edward Elgar Publishing
3. Environmental Management, T V Ramachandra and Vijay Kulkarni, TERI Press
4. Indian Standard Environmental Management Systems — Requirements With Guidance For Use, Bureau Of Indian Standards, February 2005
5. Environmental Management: An Indian Perspective, S N Chary and Vinod Vyasulu, Maclillan India, 2000
6. Introduction to Environmental Management, Mary K Theodore and Louise Theodore, CRC Press
7. Environment and Ecology, Majid Hussain, 3rd Ed. Access Publishing.2015



Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

EXCELSSIOR EDUCATION SOCIETY'S
K. C. College of Engineering & Management Studies & Research
Mith Bunder Road, Kopri, Thane (E)

# 2. Courses Integrate Gender issues

| Course Code | Course Name | Teaching Scheme (Contact Hours) | | Credits Assigned | | |
|---|---|---|---|---|---|---|
| | | Theory | Practical | Theory | Practical | Total |
| ITC503 | Entrepreneurship and E-business | 03 | -- | 03 | -- | 03 |

| Course Code | Course Name | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Theory | | | | | Term Work | Pract / Oral | Total |
| | | Internal Assessment | | | End Sem Exam | Exam Duration (in Hrs) | | | |
| | | Test1 | Test2 | Avg. | | | | | |
| ITC503 | Entrepreneurship and E-business | 20 | 20 | 20 | 80 | 03 | -- | -- | 100 |

**Course Objectives:**

| Sr. No. | Course Objectives |
|---|---|
| The course aims: | |
| 1 | Distinguish Entrepreneur and Entrepreneurship starting and feasibility study. |
| 2 | Realize the skills required to be an entrepreneur |
| 3 | Acquaint the students with challenges of starting new ventures |
| 4 | Identify the right sources of fund for starting a new business |
| 5 | Be familiarized with concept of E-business Models. |
| 6 | Understand various E-business Strategies. |

**Course Outcomes:**

| Sr. No. | Course Outcomes | Cognitive levels of attainment as per Bloom's Taxonomy |
|---|---|---|
| On successful completion, of course, learner/student will be able to: | | |
| 1 | Understand the concept of entrepreneurship and its close relationship with enterprise and owner-management. | L1,L2 |
| 2 | Understand the nature of business development in the context of existing organizations and of new business start-ups. | L1,L2 |
| 3 | Comprehended important factors for starting a new venture and business development. | L1,L2,L3 |
| 4 | Know issues and decisions involved in financing and resourcing a business start-up | L1,L2,L3,L4 |
| 5 | Describe various E-business Models | L1,L2,L3,L4 |
| 6 | Discuss various E-business Strategies. | L1,L2,L3,L4 |

**Prerequisite: None**

Dr. Vilas N. Nitnaware
K.C. College of Engineering & Management Studies & Research.

**DETAILED SYLLABUS:**

| Sr. No. | Module | Detailed Content | Hours | CO Mapping |
|---|---|---|---|---|
| 0 | Prerequisite | **None** | -- | -- |
| I | Introduction | Concept, meaning and definition of Entrepreneur and Entrepreneurship. Evolution of Entrepreneurship, Role of Entrepreneurship in economic Development; Managerial vs entrepreneurial approach; Classification and types of Entrepreneurs. Characteristics and qualities of successful Entrepreneurs; Women Entrepreneurs; Corporate & Social entrepreneurship.<br><br>**Self-learning Topics:** Factors impacting emergence of entrepreneurship. | **04** | CO1 |
| II | Entrepreneurship Development and Leadership | Entrepreneurial Motivation: motivating factors, Types of startups; Characteristics of entrepreneurial leadership, Components of Entrepreneurial Leadership; Factors influencing entrepreneurial development and motivation, Entrepreneurial Opportunities and challenges, Entrepreneurship process. Types of Enterprises and Ownership Structure: small scale, medium scale and large-scale enterprises: Meaning and definition (evolution), role of small enterprises in economic development; proprietorship, Policies governing SMEs, partnership, Ltd. companies and co-operatives: their formation, capital structure and source of finance.<br><br>**Self-learning Topics:** study the white paper https://www.ncert.nic.in/ncerts/l/lebs213.pdf | **06** | CO2 |
| III | New Venture Planning | Methods to Initiate Ventures; Acquisition-Advantages of acquiring an ongoing venture and examination of key issues; Developing a Marketing plan-customer analysis, sales analysis and competition analysis, Business Plan-benefits of drivers, perspectives in business plan preparation, elements of a business plan; Business plan failures.<br><br>**Self-learning Topics:** Refer following URL to study various case studies https://www.entrepreneurindia.co/case-studies | **07** | CO3 |
| IV | Financing & Managing Venture | Financing Stages; Sources of Finance; Venture Capital; Criteria for evaluating new-venture proposals & Capital-process. Management of venture: objectives and functions of management, scientific management; general and strategic management; introduction to human resource management: planning, job analysis, training, recruitment and selection<br><br>**Self-learning Topics:** visit website | **06** | CO4 |

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| | | | | |
|---|---|---|---|---|
| | | https://www.startupindia.gov.in | | |
| V | Overview of E – business | Concept of E-business, Business Success through adoption of technology, information management for business Initiatives, Performance improvement through e-business. Introduction to various collaborative partnerships, E-commerce: Sectors of e-commerce, B to C, B to B and C to C ecommerce, E-commerce success factors, clicks and Bricks in ecommerce, collaborative commerce. E-Marketplace, M-commerce, E-Government; Various E-business Models, Challenges of the E-Business Models, Globalization of E-business.<br><br>**Self-learning Topics:** Social media applications for E-Business, Social media analytics. | **08** | CO5 |
| VI | Strategic Initiatives for Technology | **Customer Relationship Management:**<br>The evolution of CRM, functional areas of CRM, contemporary trends - SRM, PRM AND ERM, Future Trends of CRM<br>**Enterprise Resource Planning**:<br>Core and Extended ERP; components of ERP system; Benefits and Risks of ERP implementation<br>**Supply Chain Management**:<br>Meaning, definition, importance, and characteristics of SCM, Elements of SCM, Push & Pull supply chain model, Use of e-business to restructure supply chain, Supply chain management implementation<br>**Procurement**:<br>Meaning and advantages of e –procurement, Types& Drivers of e- procurement, Components of e-procurement systems, Implementation of e-procurement<br><br>**Self-learning Topics:** SEM and SEO E-CRM | **08** | CO6 |

**Textbooks:**


1 Entrepreneurship; Robert Hisrich, Michael Peters; Tata McGraw Hill Publication
2 Entrepreneurship: New venture creation by David Holt, Prentice Hall of India Pvt. Ltd.
3 E- Business & E– Commerce Management: Strategy, Implementation, Practice – Dave Chaffey, Pearson Education
4 E-commerce – A Managerial Perspective- P. T. Joseph, Prentice Hall India Publications. Content


Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

**References:**


1 Entrepreneurship and Innovations in E-business An Integrative Perspective by Fang Zhao, Idea Group Publications.
2 Business Driven Technology –Haag/Baltzan/Phillips –Tata McGraw Hill Publication
3 Digital Business and E-commerce Management by Dave Chaffey, David Edmundson-Bird, Tanya Hemphill, Pearson Education
4 E-Business 2.0 Roadmap for Success by Dr. Ravi Kalakota, Marcia Robinson, Pearson Education
5 Case Studies in International Entrepreneurship: Managing and Financing Ventures in the Global Economy. By Walter Kuemmerle, Walter Kuemmerle. McGraw-Hill/Irwin, 2004.

ISBN: 0072977841.

**Note: -** It is advisable that faculty should discuss case studies in the classroom

**Assessment:**

**Internal Assessment (IA) for 20 marks:**

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marksQ.1** will be **compulsory** and should **cover maximum contents of the syllabus**
- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)
- A total of **four questions** need to be answered

EXCELSSIOR EDUCATION SOCIETY'S
K. C. College of Engineering & Management Studies & Research
Mith Bunder Road, Kopri, Thane (E)

# 3. Courses Integrate Environment and Sustainability

| | | | | | |
|---|---|---|---|---|---|
| **Semester** | : | **III-Core** | | | |
| **Title of the Subject / course** | : | **Competency Based HRM and Performance Management** | | | |
| **Course Code** | : | | | | |
| **Credits** | : | **4** | **Duration** | : | **40** |

**Learning Objectives**

| | |
|---|---|
| 1 | To provide both theoretical and application-oriented inputs on competency mapping and developing mapped competencies. |
| 2 | To understand the concept of competency and competency based HR practices. |
| 3 | To understand the various approaches towards building a competency model |
| 4 | To understand how to integrate the applications of competency model with other HRM functions. |
| 5 | To impart the understanding about the Performance Management system and strategies adopted by the Organizations |

| | |
|---|---|
| **Prerequisites if any** | |
| **Connections with Subjects in the current or Future courses** | |

**Module**

| Sr. No. | Content | Activity | Learning outcomes |
|---|---|---|---|
| 1 | **Concept and definition of Role and competency**. History of competency, Types of competencies – generic/specific. Competency description, Competency levels, Designing competency dictionary, Why to promote a competency culture, Context and Relevance of competencies in modern organizations Evolution of Competency based HRM, Competency Selection; Competency based Training & Development. Competency Based Performance Management; Competency Based Career & Succession Planning, linking HR processes to organizational strategy, competency framework – development of personal competency framework, Developing Competency Models ,Issues relating to Competency models. | Case Studies, Class Discussions, Assessment Centre exercises, Field Project, Presentations, Practical Examples Assignments | Basic Understanding concept of Competency and its relevance to modern day Organizations. |



Dr. Vilas N. Nitnaware

| Sr. No. | Content | Activity | Learning outcomes |
|---|---|---|---|
| 2 | **Methods of Data Collection for Mapping:- .** Observation b. Repertory Grid c. Critical Incidence Technique d. Expert Panels e. Surveys , Job Task Analysis h. Behavioral Event Interview, i. use of technology. Developing Competency Models from Raw Data: a. Data Recording b. Analyzing The Data c. Content Analysis of Verbal Expression d. Validating the Competency Models | Case Studies, Class Discussions, Assessment Centre exercises, Field Project, Presentations, Practical Examples Assignments | Gaining knowledge about the various methods of data collection in mapping process and knowledge of validating the Competency model. |
| 3 | **Competency Mapping and Assessment** – Meaning, purpose and Benefits, Steps in Competency Mapping –, Measuring and mapping competencies a. BEI b. Assessment centre c. Conducting and operating assessment centre d. Role of assessors in an assessment centre e. Designing tools in an assessment centre f. Integration of data , Report Writing and g. Feedback mechanism . Approaches to Mapping | Case Studies, Class Discussions, Assessment Centre exercises, Field Project, Presentations, Practical Examples Assignments | Knowledge about running the assessment centre and Report writing and learning about how to give feedback. |
| 4 | **Conceptual Framework of Performance Management** Performance Management process; Objectives of Performance Management system; Historical development in India; Performance management and Performance appraisal; Linkage of Performance Management system with other HR practices. Components of Performance Management System: Performance planning; Ongoing support and coaching; Performance measurement and evaluation. | Case Studies, Class Discussions, Assessment Centre exercises, Field Project, Presentations, Practical Examples Assignments | Learning about the conceptual frame work of Performance Management System and its linkage with HR practices |
| 5 | Implementation and Issues in Performance Management:<br>a. Defining Performance<br>b. Determinants of Performance<br>c. Performance Dimensions<br>d. Approaches to Measuring Performance<br>e. Diagnosing The Causes of Poor Performance<br>f. Differentiating Task from Contextual Performance | Case Studies, Class Discussions, Assessment Centre exercises, Field Project, Presentations, Practical Examples Assignments | Learning about the Implementation of Performance Management System, issues and challenges |

| Sr. No. | Content | Activity | Learning outcomes |
|---|---|---|---|
| | g. Choosing a Performance Measurement Approach.<br>h. Measuring Results and Behaviors<br>i. Gathering Performance Information<br>j. Implementing Performance Management System | | |
| 6 | Performance Management and Employee Development:<br>a. Personal Development Plans<br>b. 360 Degree Feed Back as a Developmental Tool<br>c. Performance Management and Reward System<br>d. Performance Linked Remuneration System<br>e. Performance Linked Career Planning and Promotion Policy | Case Studies, Class Discussions | Studying performance management as a tool for employee development |
| 7 | Conducting Staff Appraisals<br>a. Introduction & Need<br>b. Skills Required<br>c. The Role of The Appraiser<br>d. Job Description and Job Specification<br>e. Appraisal Methods<br>f. Raters Errors<br>g. Data Collection<br>h. Conducting an Appraisal Interview<br>i. Follow Up and Validation | Case Studies, Class Discussions | Understanding the process of conducting staff appraisal |
| 8 | Performance Consulting:<br>a. Concept<br>b. The Need for Performance Consulting<br>c. Role of The Performance Consulting<br>d. Designing and Using Performance Relationship Maps<br>e. Contracting for Performance Consulting Services<br>f. Organizing Performance Improvement Department | Case Studies, Class Discussions | Understanding performance consulting |
| 9 | Reward for Performance:<br>a. Reward System, Components of Reward System,<br>b.Objective of Reward System,<br>Linkage of performance management to reward and compensation System<br>Performance Management Pitfalls and | Case Studies, Class Discussions | Study of rewards for performance |

| Sr. No. | Content | Activity | Learning outcomes |
|---|---|---|---|
| | Remedies,<br>c.Recognizing the problems and Pitfalls, Limitations, Shortcoming or efficiencies of performance appraisal, Guideline for performance appraisal and good practices | | |
| 10 | Ethics in Performance Management:<br>a.Ethical Performance Management Defined, Objectives and Significance of Ethics in performance Management,<br>b.Ethical issues and dilemmas in Performance Management, Ethical Strategies in Performance management, Performance Management in Multinational Corporations | Case Studies, Class Discussions | Overview of ethical practices in performance management |
| 11 | Case Study and Presentations | | |

**Text books**

| | |
|---|---|
| 1 | Armstrong, M. & Baron, A., Performance Management and development, Jaico Publishing House, Mumbai. |
| 2 | Armstrong, M., Performance management: Key strategies and practical guidelines, Kogan Page, London. |
| 3 | Bagchi, S. N., Performance management, Cengage Learning India |
| 4 | Bhattacharyya, D.K., Performance management systems and strategies, Pearson Education |

**Reference books**

| | |
|---|---|
| 1 | Seema Sanghi: 'Handbook of Competency Mapping'; Response Books; Latest Edition |
| 2 | Ganesh Shermon: 'Competency based HRM'; Tata McGraw Hill; Latest Edition. |
| 3 | Whiddett and Hollyforde: 'A Practical Guide to Competencies'; Chartered Institute of Personnel and Development; Latest Edition. |

**Assessment**

| | |
|---|---|
| Internal | 40% |
| Semester end | 60% |

K.C. College of Engg. and Management Studies and Research * THANE (E)

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

EXCELSSIOR EDUCATION SOCIETY'S
K. C. College of Engineering & Management Studies & Research
Mith Bunder Road, Kopri, Thane (E)

# 2. Courses Integrate Human Values

| | | | | | |
|---|---|---|---|---|---|
| **Semester** | : | **I - Core** | | | |
| **Title of the Subject / course** | : | **Perspective Management** | | | |
| **Course Code** | : | | | | |
| **Credits** | : | **4** | **Duration in Hrs** | : | **40** |

**Learning Objectives**

| | |
|---|---|
| 1 | To explain the relationships between organizational mission, goals, and objectives |
| 2 | To comprehend the significance and necessity of managing stakeholders |
| 3 | To conceptualize how internal and external environment shape organizations and their responses |
| 4 | To develop critical thinking skills in identifying ethical, global, and diversity issues in planning, organizing, controlling and leading functions of management |
| 5 | To Understand organizational design and structural issues |
| 6 | To understand that citizenship involves taking conscious steps for societal advancement at individual level and organizational level |

| | |
|---|---|
| **Prerequisites if any** | |
| **Connections with Subjects in the current or Future courses** | |

**Module**

| Sr. No. | Content | Activity | Learning outcomes |
|---|---|---|---|
| 1 | Fundamentals for personal and organisational success Fundamentals of personal leadership | Lecture, interaction, discussion.Examining success stories through videos of industry pioneers followed by discussion | The student will be able to look at multiple perspectives that impact business and life. |
| 2 | Management: Science, Theory and Practice – The Evolution of Management Functions of Management Nature and purpose of Planning Objectives, Strategies, Policies and Planning Premises – Decision making – Global Planning | Self-study, Discussion, Quiz | To demonstrate empirical understanding of various organizational processes and behaviors and the theories associated with them |
| 3 | Managing your career and understanding organisational dynamics: - Leadership functions and corresponding skills required - Choosing the right positions | Discussion | The student will be able to demonstrate leadership behaviours which will be three pronged: leading self, leading others and leading for change and impact. |

K.C. College of Engg. and Management Studies and Research ★ THANE (E)

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

| Sr. No. | Content | Activity | Learning outcomes |
|---|---|---|---|
| | - Special dilemmas of early career<br>- Landing stretch assignments<br>- Building a network of relationships<br>- Challenges faced by the minority<br>- Developing ethical judgment<br>- Assessing your career | | |
| 4 | Managing in adversities / Management of crisis | Case Study | The Student will explore different approaches and their consequences during crisis management |
| 5 | Social Responsibility, Ethics and Sustainable Development | Discussion, Case study, Group work, Movie, Student Presentation, Debate on MBA Oath | To understand the role of managers and citizens in society |
| 6 | Mind control and spiritual Quotient | Literature Reading, Discussion | The Student will learn ways of staying positive and having a healthy mind |
| 7 | Role and Responsibilities of a Manager, Effective and Ineffective Managerial styles | Caselets, role plays and discussions | To understand the roles and functions of managers at various (entry, middle and the top) levels |
| 8 | Difference between management and leadership, Understanding Level 5 Leadership | Literature reading and Discussion | The student will understand the behavior, skills and mindset of a manager and of a leader. |
| 9 | Strategic Management – Definition, classes of decisions, levels of decision, Strategy, Role of different Strategists, Relevance of Strategic Management and its benefits, Strategic Management in India | Discussion, Student Presentations, Case study | The Student will understand various concepts and examples related to Strategic Management |
| 10 | Change Management | Discussion, Movies, Case study | The Student will learn about the various steps to be followed to bring about change |
| 11 | Total Quality Management | Discussion, Quiz | The Student will understand the concepts and examples of TQM |

K.C. College of Engg. and Management Studies and Research THANE (E)

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

**PROGRAM: MMS**

| | |
|---|---|
| 1 | Principles and Practices of Management by DrKiranNerkar and Dr Vilas Chopde |
| 2 | Principles of Management – Davar |
| 3 | Essentials of Management – Koontz &Weihrich |
| 4 | Strategic Management – V S P Rao& V Hari Krishna |

**Reference books**

| | |
|---|---|
| 1 | The Leader Within – DreaZigarmi, Michael O'Connor, Ken Blenchard, Carl Edeburn |
| 2 | The Action-Centred Leadership – John Adair |
| 3 | Good to Great – Jim Collins |
| 4 | Leadership – Rudolph Guliani |
| 5 | The Mind and its Control – Swami Budhananda |
| 6 | Management – a competency building approach – HeilReigel / Jackson/ Slocum |

**Assessment**

| | |
|---|---|
| Internal | 40% |
| Semester end | 60% |

Dr. Vilas N. Nitnaware
Principal
K.C. College of Engineering & Management Studies & Research.

K.C. College of Engg. and Management Studies and Research ★ THANE (E)