J.C. Bose University of Science & Technology YMCA, Faridabad

(A Haryana State Government University)

(Established by Haryana State Legislative Act No. 21 of 2009 & Recognized by UGC Act 1956 u/s 22 to Confer Degrees)

Accredited 'A' Grade by NAAC

COMMUNITY COLLEGE OF SKILL DEVELOPMENT

Sub: **Minutes of 7th Meeting of Board of Studies (BOS) Community College of Skill Development held on 18/05/2020 at 1.00 PM on the Zoom Application.**

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Present:

1. Dr. Sanjeev Goyal, Principal CCSD & Nodal Officer, B.Voc : Chairperson
2. Dr. Rashmi Popli, Nodal officer, Community College : Member
3. Dr. Anju Gupta, Associate Professor, JCBUST, Faridabad : Member
4. Dr. Sandhya Dixit, Associate Professor, JCBUST, YMCA, Faridabad : Member
5. Sh. Parbhakar Yadav, Op. Manager, M/s Durga Threading Tools, Faridabad : Member

The following members could not attend the meeting: -

1. Mr. Pankaj Munjal
2. Representative of SSCs

At the outset, Dr.Sanjeev Goyal, Principal CCSD and Chairman-Board of Studies warmly welcomed all the members of the Board of Studies of Community College of Skill Development. The Chairman also appreciated the interest and the presence of outside members, who took pain to attend this meeting out of their busy schedule, for the healthy discussion on the academic development of the Community College.

Thereafter, the Agenda Items taken up and after detailed deliberation/discussion, the following decisions were taken.

Item No. BOS/07/01: **To consider and confirm the Minutes of its previous meeting held on 24/10/2019.**

The Board considered and confirmed the Minutes of its 6th meeting held on 24/10/2019.

Item No. BOS/07/02: **To note the Action Taken Report (ATR) on the Minutes of BOS meeting held on 24/10/2019.**

The Chairman informed the Board regarding the action taken on the minutes of BOS meeting held on 24/10/2019, where necessary. The Board noted the Action Taken Report, as placed before it.

Item No. BOS/07/03: **To note the matter of starting of new course B.Voc in Banking financial and Insurance Services (BFSI) and also consider & approve the Scheme & syllabi with elective courses of B.Voc in Banking financial and Insurance Services (BFSI).** ***(Annexure – A)***

The Board noted the matter regarding the starting of the course B.Voc in Banking financial and Insurance Services (BFSI) from the session 2020-21 and after detailed deliberations/discussions approved the scheme & syllabi to be followed in B.Voc courses in Banking financial and Insurance Services (BFSI).

Item No. BOS/07/04: **To consider and approve the scheme & syllabus of B.Voc courses in Automobile, Manufacturing, Electrical and Web Development.** ***(Annexure – B)***

It was brought to the notice of the Board that earlier the scheme & syllabi upto 2nd year of above courses were approved by the Board. It was informed by the Chairman (BOS) that as per requirement, some modifications have been made in the scheme and syllabi of these courses and elective subjects have been also introduced in the syllabus. However, the modified scheme & syllabi of B.Voc courses in Automobile, Electrical, Manufacturing, Web Development are placed before the Board for consideration and approval.

The board after detailed deliberations/discussions approved the scheme & syllabi to be followed in B.Voc courses in Automobile, Electrical, Manufacturing and Web Development.

Item No. BOS/07/04: **To consider and approve the scheme & syllabus of PG Diploma Courses (Data Science & Analytics and Yoga Science & Naturopathy).** ***(Annexure – C)***

The board after detailed deliberations/discussions approved the scheme & syllabi to be followed in PG Diploma Courses (Data Science & Analytics and Yoga Science & Naturopathy).

Item No. BOS/07/05: **To consider and approve the Fee structure-2020 of Community College of Skill Development.**

The Board considered and approved the Fee Structure of Community College of Students.

Item No. BOS/07/06 : **To consider and approve the proposal regarding following the University Examination Ordinances.**

It was brought to the notice of the Board that conduct of examination in respect of CCSD students has been assigned to the Controller of Examination Office of the University. The Board considered and approved to follow the University Examination Ordinance for all courses.

Item No. BOS/07/07 : **To consider and approve syllabus of Entrance Test for admission in B.Voc Courses.**

The Board was informed that from the session 2020-21, the CCSD is going to organize an Entrance Test for all B.Voc Courses. The board considered and approved the syllabus of Entrance Test.

Item No. BOS/07/08: **To consider and approve the list of teachers for taking classes and conducting internal examinations of CCSD students.**

The Board after going through the agenda note approved the list of teachers for taking classes and conducting Internal Examinations of CCSD students with the suggestion that area of specialization of teachers should be mentioned in the list.

Item No. BOS/07/9: **To consider and approve the Information Brochure of CCSD for Academic Session 2020-2021.**

The Board after going through the Information Brochure-2020 of CCSD considered and approved the Information Brochure2020.

Item No. BOS/07/10: **To consider and approve the Online Application Fee of B.Voc and Diploma Courses.**

The Board considered and approved the Online Application Fee of B.Voc and Diploma Courses.

Item No. BOS/07/11: **To consider and approve the minimum stipend Criteria for On Job Training (OJT) in Industries.**

The Board considered and approved that the minimum stipend payable to the students for On Job Training (OJT) in Industries is Rs. 5000/- per month.

Meeting ended with a vote of thanks to the Chair.

Dr. Sanjeev Goyal
Principal (CCSD) & Chairman-BOS

Annexure – 1 of BOS dated 18.05.2020

1. The list of new courses introduced in the approved syllabus of B.Voc (Automobile, Electrical, Manufacturing, Web Development and BFSI) and PG Diploma (Yoga Science & Naturopathy and Data Science & Analytics) has been attached.
2. The following Table depict the %age revision in syllabus:

S.No.	Program Name	%age revision in syllabus	Details
1	B.Voc BFSI	100%	List of revised/new courses is attached. Revisions are also highlighted in the course syllabus.
2	B.Voc Electrical	45%	List of revised/new courses is attached. Revisions are also highlighted in the course syllabus.
3	B.Voc Manufacturing	40%	List of revised/new courses is attached. Revisions are also highlighted in the course syllabus.
4	B.Voc Web Development	35%	List of revised/new courses is attached. Revisions are also highlighted in the course syllabus.
5	B.Voc Automobile	40%	List of revised/new courses is attached. Revisions are also highlighted in the course syllabus.
6	PG Diploma Data Science and Analytics	10%	List of revised/new courses is attached. Revisions are also highlighted in the course syllabus.
7	PG Diploma Yoga Science & Naturopathy	10%	List of revised/new courses is attached. Revisions are also highlighted in the course syllabus.

Principal, CCSD

New Courses Introduced 2020-2021

Program Name	Name of the Course	Course Code
B.VOC WEB DEVELOPMENT	TECHNOLOGY TRENDS IN IT	PCC-WD-601
B.VOC WEB DEVELOPMENT	PYTHON LAB	PCC-WD-603
B.VOC WEB DEVELOPMENT	INTRODUCTION TO PYTHON	PCC-WD-602
B.VOC WEB DEVELOPMENT	ENTREPRENEURSHIP	BSC-601
B.VOC WEB DEVELOPMENT	MINOR PROJECT	BSC-602
B.VOC WEB DEVELOPMENT	ON JOB TRAINING	OJT-WD-501
B.VOC ELECTRICAL	INDUSTRIAL ELECTRONICS AND CONTROL OF DRIVES - I	PCC-EL-303
B.VOC ELECTRICAL	ELECTRICAL MACHINES-II	PCC-EL-301
B.VOC ELECTRICAL	POWER SYSTEM-I	PCC-EL-302
B.VOC ELECTRICAL	ELECTRICAL WORKSHOP	PCC-EL-308
B.VOC ELECTRICAL	ON JOB TRAINING	OJT-EL-501
B.VOC ELECTRICAL	ENTREPRENEURSHIP	BSC-601
B.VOC ELECTRICAL	FUNDAMENTALS OF ELECTROMAGNETISM	PCC-EL-601
B.VOC ELECTRICAL	INDUSTRIAL ELECTRONICS AND CONTROL OF DRIVES - II	PCC-EL-602
B.VOC ELECTRICAL	MINOR PROJECT	BSC-602
B.VOC AUTOMOBILE	ENGINEERING SCIENCE	PCC-AM-106

B.VOC AUTOMOBILE	IT TOOLS	PCC-AM-306
B.VOC AUTOMOBILE	ENTREPRENEURSHIP	BSC-601
B.VOC AUTOMOBILE	PROJECT	BSC-602
B.VOC AUTOMOBILE	ALTERNATIVE FUELS & EMISSION CONTROL	PCC-A-604
B.VOC AUTOMOBILE	VEHICLE PERFORMANCE AND TESTING	PCC-A-605
B.VOC AUTOMOBILE	INDUSTRIAL MANAGEMENT	PCC-AM-603
B.VOC AUTOMOBILE	VEHICLE BODY ENGINEERING	PCC-A-608
B.VOC AUTOMOBILE	AUTRONICS	PCC-A-607
B.VOC MANUFACTURING	ENGINEERING SCIENCE	PCC-AM-106
B.VOC MANUFACTURING	IT TOOLS	PCC-AM-306
B.VOC MANUFACTURING	ENTREPRENEURSHIP	BSC-601
B.VOC MANUFACTURING	PROJECT	BSC-602
B.VOC MANUFACTURING	INDUSTRIAL MANAGEMENT	PCC-AM-603
B.VOC MANUFACTURING	QUALITY CONTROL TECHNIQUES	PCC-M-604
B.VOC MANUFACTURING	RELIABILITY, MAINTENANCE & SAFETY ENGINEERING	PCC-M-605
B.VOC MANUFACTURING	PLANT LAYOUT & PRODUCT HANDLING	PCC-M-607
B.VOC MANUFACTURING	CAD & CAM	PCC-M-608
B.VOC MANUFACTURING	MACHINE & MACHINE TOOLS	PCC-M-307
B.VOC BFSI	BANKING AND MICRO FINANCE	BFSI-101
B.VOC BFSI	FOUNDATIONS OF MANAGEMENT	BFSI-103

B.VOC BFSI	BUSINESS ECONOMICS	BFSI-104
B.VOC BFSI	INDIAN SECURITIES MARKETS	BFSI-102
B.VOC BFSI	COMMUNICATION PRACTICAL	BFSI-105
B.VOC BFSI	VOCATIONAL PRACTICAL - I	BFSI-106
B.VOC BFSI	MARKETING MANAGEMENT	BFSI-201
B.VOC BFSI	HUMAN RESOURCE MANAGEMENT	BFSI-202
B.VOC BFSI	MICRO FINANCE OPERATIONS	BFSI-203
B.VOC BFSI	MUTUAL FUND OPERATIONS	BFSI-204
B.VOC BFSI	VOCATIONAL PRACTICAL - II	BFSI-205
B.VOC BFSI	CONSUMER BEHAVIOR	BFSI-301
B.VOC BFSI	RETAIL BANKING & OPERATIONS –I	BFSI-302
B.VOC BFSI	DEPOSITORY OPERATIONS – I	BFSI-303
B.VOC BFSI	BUSINESS COMMUNICATION	BFSI-304
B.VOC BFSI	COMPUTATIONAL LAB	BFSI-305
B.VOC BFSI	VOCATIONAL PRACTICAL	BFSI-306
B.VOC BFSI	INDIAN BUSINESS ENVIRONMENT	BFSI-401
B.VOC BFSI	RETAIL BANKING & OPERATIONS –II	BFSI-402
B.VOC BFSI	DEPOSITORY OPERATIONS – II	BFSI-403
B.VOC BFSI	ORGANIZATIONAL BEHAVIOR	BFSI-404
B.VOC BFSI	COMPUTATIONAL LAB	BFSI-405
B.VOC BFSI	VOCATIONAL PRACTICAL	BFSI-406
B.VOC BFSI	BUSINESS BANKING & OPERATIONS	BFSI-501

B.VOC BFSI	SECURITIES OPERATIONS	BFSI-502
B.VOC BFSI	ADVERTISING AND SALES MANAGEMENT	BFSI-503
B.VOC BFSI	SERVICE MARKETING	BFSI-504
B.VOC BFSI	VOCATIONAL PRACTICAL	BFSI-505
B.VOC BFSI	LIFE INSURANCE & OPERATIONS	BFSI-601
B.VOC BFSI	GENERAL INSURANCE & OPERATIONS	BFSI-602
B.VOC BFSI	BUSINESS POLICY AND STRATEGIC MANAGEMENT	BFSI-603
B.VOC BFSI	HUMAN RIGHTS AND VALUES	BFSI-604
B.VOC BFSI	PROJECT WORK	BFSI-605

Annexure – “A”

SCHEME OF EXAMINATION

And

SYLLABUS

For

BACHELOR OF VOCATION

In

Banking Finance Services and Insurance (BFSI)

J. C. Bose University of Science & Technology,

YMCA, Faridabad, Haryana.

1. Introduction

All India Council for Technical Education (AICTE) Ministry of HRD, Government of India has introduced Entrepreneurship oriented Skill development courses of B.Voc/D.Voc/Skill Diploma. These courses will be run by AICTE approved institutes by using available infrastructure and facilities. In these courses the institute will conduct general education content and sector specific skills will be imparted by Skill Knowledge Providers/ Training Providers/ Industries.

1.1 Key Features:

Objectives

- To provide judicious mix of skills relating to a profession and appropriate content of General Education.
- To ensure that the students have adequate knowledge and skills, so that they are work ready at eachexit point of the programme.
- To provide flexibility to the students by means of pre-defined entry and multiple exit points.
- To integrate NSQF within the Diploma, undergraduate level of higher education to enhance employability of the students and meet industry requirements. Such student apart from meeting the needs of local and national industry are also expected to be equipped to become part of the global workforce.
- To provide vertical mobility to students admitted in such vocational courses.
- The certification levels will lead to Diploma/Advanced Diploma/B. Voc. Degree in Banking Finance Services and Insurance (BFSI)and will be offered by respective affiliating University/Board of Technical Education.
- Students may be awarded Level Certificate/Diploma/Advance Diploma /Degree as out-lined in the Table below:

Award	Duration after class X	Corresponding NSQF level
Diploma	3 Year	5
Advance Diploma	4 Years	6
B.Voc Degree	5 Years	7

2. Course Objectives

After successfully completing the vocational course, the student would have acquired relevant appropriate and adequate technical knowledge together with the professional skills and competencies in the field of Banking Finance Services and Insurance (BFSI) so that he/she is properly equipped to take up gainful employment in this Vocation. Thus he/she should have acquired: -

A. Understanding of

(a) The relevant basic concepts and principles in banking and insurance so that he/she is able to understand the subject.

(b) The basic concepts in Business Operation &Administration.

(c) The concepts, principles of working of basic Marketing & Accounting.

(d) The knowledge of Retail & Finance and the Risk Management practices.
(e) The concepts and principles used in Depository Operations & Entrepreneurship.

B. Adequate Professional Skills and Competencies in

(a) Installation of Costing System.
(b) Concept of Annuity & Policies.
(c) Scope &Importance of Marketing.

C. A Healthy and Professional Attitude so that He/She has

(a) An analytical approach while working on a job.
(b) An open mind while locating/rectifying faults.
(c) Respect for working with his/her own hands.
(d) Respect for honesty, punctuality and truthfulness

D. NSQF compliant skills in Qualification developed by sector skill council in Banking, Financial Services & Insurance sector

3. Course Structure

The course will consist of combination of practice, theory and hands on skills in theBanking, Financial Services & Insurance sector.

1. Curriculum

The curriculum in each of the years of the programme would be a suitable mix ofgeneral education and skill components.

2. Skill Components:

- The focus of skill components shall be to equip students with appropriate knowledge, practice and attitude, to become work ready. The skill components will be relevant to the industry as per its requirements.
- The curriculum will necessarily embed within itself, National Occupational Standards (NOSs) of specific job roles within the industry. This would enable the students to meet thelearning outcomes specified in the NOSs.
- The overall design of the skill development component along with the job roles selected willbe such that it leads to a comprehensive specialization in few domains.
- The curriculum will focus on work-readiness skills in each of the year of training.
- Adequate attention will be given in curriculum design to practical work, on the job training, development of student portfolios and project work.

3. ***General Education Component****:*

- The general education component adhere to the normal senior secondary and university standards. It will emphasize and offer courses which provide holistic development. However,it will not exceed 40% of the total curriculum.
- Adequate emphasis is given to language and communication skills.

SCHEME OF BVOC BFSI

Year	FIRST SEMESTER		SECOND SEMESTER	
	Course	**Credits**	**Course**	**Credits**
I	Banking & Micro Finance	3	Marketing Management	3
	Indian Securities Markets	3	Human Resource Management	3
	Foundations of Management	3	Micro Finance Operations	3
	Business Economics	3	Mutual Fund Operations	3
	Communication Practical	9	Vocational Practical	18
	Vocational Practical –II	9		
	Total	30	Total	30
	Cumulative credits = 30 (Certificate)		***Cumulative credits = 60 (Diploma)***	
Year	**THIRD SEMESTER**		**FOURTH SEMESTER**	
	Course	**Credits**	**Course**	**Credits**
II	Consumer Behavior	3	Indian Business Environment	3
	Retail Banking & Operations –I	3	Retail Banking & Operations –II	3
	Depository Operations – I	3	Depository Operations – II	3
	Business Communication	3	Organizational Behavior	3
	Computational Lab	9	Computational Lab	9
	Vocational Practical	9	Vocational Practical	9
	Total	30	Total	30
	Cumulative credits = 120 (Advance Diploma)			
Year	**FIFTH SEMESTER**		**SIXTH SEMESTER**	
	Course	**Credits**	**Course**	**Credits**
III	Business Banking & Operations	3	Life Insurance & Operations	3
	Securities Operations	3	General Insurance & Operations	3
	Advertising and Sales Management	3	Business Policy and Strategic Management	3
	Service Marketing	3	Human Rights and Values	3
	Vocational Practical	18	Project Work	18
	Total	30	Total	30
	Cumulative credits = 180 (B. Voc. Degree)			

Detailed Curriculum(1st Sem)

BANKING & MICRO FINANCE
Paper Code: BFSI - 101

Semester -1st	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course Outcomes(Cos):

After the successful completion of the course, students will be able to:

CO1- Know the different elements of Financial Sector and importance of Banks in Indian Economy.
CO2- Realize the role and importance of RBI and commercial Banks and the role of commercial bank in controlling the credit in economy
CO3- Understand the various kind of banking Products and services available in Indian banking context.
CO4- Recognize the significance of Micro finace in field of Financial Inclusion.
CO5- Acknowledge the various legal structure of Micro Finance Institutions in India

Course Contents:

Unit-I Overview of the BFSI Domain in INDIA, Roles & importance of Banks in an economy, types of Banking & Banks in INDIA, Structure of Indian Banking Industry

Unit-II RBI& its role, Customer-Banker Relationship, Commercial Banking & Credit Creation by Commercial Banks, Basic Banking Products & Services, Financial Inclusion & Exclusion, Banking Ombudsman

Unit-III Microfinance, its need and importance, Evolution of Microfiance in India, Different Models of Microfinance, Delivery channels of Microfinance

Unit-IV SHGs & MFIs and Legal Forms, Typical organisation structure of MFs

Reference Books

1. Principles & Practice of Banks, M/S Macmillan India Ltd
2. Indian Banking, S Natrajan & Dr. R Parmeshwaram
3. Banking Principles & Operations, M.N.Gopinath

INDIAN SECURITY MARKET
Paper Code: BFSI-102

Semester – 1st	Sessional – 25 Marks
Stream– BFSI	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Outcomes(Cos):
After the successful completion of the course, students will be able to:

CO1- To provide students with an understanding of the structure, organization and working of financial markets and institutions in India.
CO2- It helps to explore the connection between the Financial Institutions, Instruments and Markets in the business environment and their role played in the Indian economy.
CO-3 It throws light on the Financial Innovations on new financial instruments for smooth and profitable investment decisions.
CO-4 Aim at giving a comprehensive understanding on the stock market operations in terms of its structure, trading, settlement procedures, processes and related components and the regulations, emerging challenges in the Indian Stock market

Course Contents:

UNIT-1
Introduction to Indian Securities Markets: Definition & characteristics of securities, Structure of Indian securities markets, Businesses and their capital requirements, Securities markets as allocators of capital, different types of security

UNIT-2
Securities Markets: The Primary Market, secondary market, difference between primary and secondary market, money market, Money Market Instruments: Treasury Bills, Commercial Bills, Commercial Paper, call loan, certificate of deposit, capital market

UNIT-3
Market Infrastructure Institutions - Stock exchange, Functions and feature of Stock Exchanges, Operations and Trading Mechanism of Stock Exchanges, Depository service and D'mat Account, Bombay Stock Exchange, National Stock Exchange, stock index: Sensex, calculation of Sensex, Nifty, calculation of Nifty, SEBI, objectives of SEBI

UNIT-4
Mutual Funds: Features of a mutual fund, Key terms and concepts associated with mutual funds, Functioning of a mutual fund, Difference between various types of fund products, Processes associated with investing in mutual funds.

Reference Books:

1. Prasanna Chandra, "Investment Analysis and Portfolio management", Tata McGraw Hill, 3rd Edn., 2008
2. Julian Walmsley, "New Financial Instruments", John Wiley & Sons, 2nd edition,
3. Bhole I. M.: "Financial Markets and Institutionals": Tata McGraw Hill, New Delhi.
4. Punithavathy Pandian, "Security Analysis and Portfolio Management", Vikas Publishing House Pvt. Ltd.

FOUNDATION OF MANAGEMENT
Paper Code: BFSI-103

Semester: 1st	Sessional: 25Marks
Stream: BFSI	Theory: 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Outcomes (Cos):

After the successful completion of the course, students will be able to:

CO1: Understand the concepts related to Business.
CO2: Demonstrate the roles, skills and functions of management.
CO3: Analyze effective application of management knowledge to diagnose and solve organizational problems and develop optimal managerial decisions.
CO4: Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities

Course Contents:

UNIT-1

Concept and Nature of Management: Concept and Definitions, Features of Management, Management as Science, Art and Profession, Levels of Management, Scope of Management, Nature of Management Process, Classification of Managerial Functions, Evolution of Management thought Approaches to Management (Classical, Behavioral, and Quantitative Contingency), Contribution of Leading Thinkers, Recent Trends in Management Thoughts.

UNIT-2

Planning and Decision Making: Nature, Process and Types of Planning, Management by Objectives (MBO), Decision Making, Forecasting.

UNIT-3

Organizing: Nature and Principles of Organizing, Departmentation, Span of Management, Authority and Responsibility, Delegation and Decentralization, Forms of Organization Structure Line and Staff Authority Relationships, Staffing, Recruitment, Selection, Training

UNIT-4

Directing: Nature and Scope of Directing, Motivation and Morale, Communication, Leadership, Coordination: Controlling: Nature and Process of Controlling, Techniques of Control.

Reference Books

1. Management Theory and Practice C.B. Gupta (CBG) Sultan Chand and Sons
2. Management Process and Organisational Behaviour, R.K. Singla, V.K Publications

BUSINESS ECONOMICS
Paper Code: BFSI-104

Semester – 1st	Sessional – 25 Marks
Stream– BFSI	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Outcomes:

CO1. To familiarize the basic concepts and theories of economics

CO2. To familiarize with the students the importance of economic approaches in managerial decision making

CO2 To understand the applications of economic theories in business decisions

Course Content:

UNIT - 1

Nature of managerial economics; significance in managerial decision making, role and responsibility of managerial economist in a business enterprise; objectives of a firm (profit maximization, managerial theories, Baumol's Sales Maximization Theory); basic concepts – short and long run, firm and industry, classification of goods and markets, opportunity cost, risk and uncertainty and profit; nature of marginal analysis

UNIT - 2

Consumer Behavior: Utility approach; law of diminishing marginal utility and law of equi- marginal utility; indifference curve approach, law of Demand; Elasticity of Demand and its measurement, Methods of Demand forecasting.

UNIT – 3

Production Function; Break Even Analysis and profit forecasting in short run, law of variable proportion; concept of cost and revenue, short run cost curves; concept of total, average and marginal revenue; relationship between average revenue, marginal revenue and elasticity of demand.

UNIT - 4

Price determination under perfect competition, oligopoly, Monopoly and Monopolistic competition; Price discrimination

Reference Books:

1. Geetika, Gosh & Choudhary, Tata McGraw Hill Education
2. T.R. Jain & O.P. Khanna, Micro Economics, Global Publications

COMMUNICATION LAB
Paper Code: BFSI-105

Semester -1st	Internal – 30 Marks
Stream–BFSI	External – 20 Marks
L T P Total Credits	Total: 50 Marks
	Duration of Exam: 3Hours

Course Outcomes:

CO1. To discuss types of communication and their forms
CO2. To improve comprehension
CO3. To improve spoken English and ability to articulate ideas
CO4. To improve formal writing skills

Course Content:

Unit 1:

Introduction to Communication: Meaning, Importance and Function of Communication, Types of communication, language of communication; advantages and disadvantages; Barriers to Communication; Organizational Communication

Unit 2:

Grammar: Parts of speech, Articles, Tenses, Formation of Sentences, Active and Passive Voice, Direct and Indirect speech

Unit 3:

Writing and Comprehension: Comprehension, Composition, Translation, Paraphrasing, Letter, Writing

Unit 4:

7 Cs of Communication; Grice's Cooperative Principle; Group Discussions; Public Speaking; Facing Interviews

Course Outcome:

1. To learn about communication process and ways to make communication effective by giving attention to all elements involved.
2. To improve grammar and gain confidence by enhancing their abilities to articulate their ideas.
3. To acquire better writing skills in formal communication.
4. To be able to revise documents for fruitful reading and comprehension.

Reference books:

1. Wren and Martin. High School English Grammar and Composition. New Delhi: RRP, 2007
2. Murphy, Raymond. Essential English Grammar. New Delhi: Cambridge, 2017

Vocational Practical – I

1. Follow the work instructions and operating instructions
2. Understanding of account opening process
3. Understanding of operating standards and Standard Operating Procedure
4. Understand the list of documents for account opening
5. Understand the document verification process
6. Understand types of errors
7. Understand the escalation process
8. Execution of work

(Semester II)

MARKETING MANAGEMENT
Paper Code: BFSI-201

Semester: 2nd	Sessional: 25Marks
Stream: BFSI	Theory: 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

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

CO1. Demonstrate strong conceptual knowledge in the functional area of marketing management and its application.
CO2. Learn about marketing process for different types of products and services
CO3. Understand the tools used by marketing managers in decision situations
CO4. Understand the marketing environment
CO5. Acknowledge the 4P's of Marketing and their respective marketing strategies

Course Contents:

UNIT-1 Introduction to Marketing: Definition, Difference in Selling/Marketing; Core Marketing Concepts: - Production, Selling, Marketing, Social Concept; Marketing Environment; Marketing Process, Functions of Marketing. Marketing Environment: The changing marketing environment, analysing needs and trends in macro environment and micro environment.

UNIT-2 Market Segmentation: bases for market segmentation of consumer goods, industrial goods and services; Market targeting and positioning strategies. Marketing Mix: its significance in the competitive environment; Product and Product Line; Product Mix; Product Life Cycle: managing the product in Product Life Cycle.

UNIT-3 New Product Development: new product and its development; Branding; Product Positioning; Product Launching Strategies; Pricing Decision and Strategies. Packaging: purpose, types and new trends in packaging.

UNIT-4 Sales Promotion: Advertising and Sales Promotion, Public Relations, Personnel Selling; Channels types and functions; Evaluating Channel Alternatives; Developing Channel Members; Channel Dynamics; Retailing, Wholesaling and Market Logistics; Web Marketing; Sales Force Decisions.

Text Books:
1. Kotler Philip, Marketing Management: Analysis, Planning, Implementation and Control, Prentice Hall of India Pvt. Ltd. New Delhi.
2. S.A. Sher, Marketing Management, Himalaya Publishing House

HUMAN RESOURCE MANAGEMENT
Paper Code: BFSI - 202

Semester -2nd	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course outcomes:

After the successful completion of the course, students will be able to:

CO1. Understand the basics of human resource management with roles and responsibilities of a human resource manager.

CO2. Analyse the human resource challenges in present scenario.

CO3. Know the essentials of employing, maintaining and promoting a motivated workforce in an organisation.

CO4. Develop critical understanding of contemporary issues of human resource management.

Course Content:

Unit-I

Human resource management - concept, Nature evolution, Difference between HRM and Personnel Management, HR Functions, HRM Manager, Responsibilities of HR Manager, human resource planning & forecasting – significance and process

Unit-II

HR recruitment: objective, types, recruitment process, sources of recruitment, selection, selection process, difference between recruitment and selection, Induction/orientation, Placement;

Unit-III

job analysis - job description and job specification, job evaluation - concept & methods, Performance appraisal, training: need of training, objective, types, methods of training

Unit-IV

Employee compensation management: Factor Influencing Employee Compensation, modes of compensation, wage payment, methods of wage payment, Pay Structure, incentives, bonus, fringe Benefits, allowances

Reference Books:

1. C.B Gupta, Human Resource Management, Sultan Chand and Sons
2. Rao, V.S.P. Managing People, Excel Publishers Pvt. Ltd., 2000

MICRO FINANCE OPERATIONS
Paper Code:BFSI - 203

Semester:2nd
Stream: BFSI
L T P Total Credits

Sessional: 25Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

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

CO1. Understand the various credit delivery models and products and their structure prevailing worldwide.
CO2. Recognize the stages in micro finace credit delivery.
CO3. Apply the knowledge of different Ratio for assesing the operational efficiency of MFIs.
CO4. Identify the types of risks involved in Micro Finace Lending and manage them appropriately
CO5. Understand the Back office operation and the skill required to perform various activities in any MFIs.

Course Contents:

UNIT-1
Microfinance Delivery Methodologies: Introduction, Structure of Intermediation for Microfinance in India, Microfinance Product Under Both SHG and MFI Model; **Financial Product & Services:** The role of MFI-Minimalist v/s Integrated, Financial Services/ products, Non-Financial Services, Designing Microfinance Product(Loan & Saving), Liquidity Management; **Group Forming and Lending Procedure;** Area Selection, CGT & GRT, Loan application, Scrutiny, Disbursement, Collection.

UNIT-2
Revenue Model of Micro-Finance: Introduction, CVP analysis, Measuring operating Efficiency and productivity in MFIs, factor affecting Operating expenses, Operating efficiency- The negative Side, What can the MFIs do to be more Efficient?;

UNIT-3
Risk Management; Introduction, Types of Risk, Managing Credit Risk; **Code of Conduct of MFIs in India:** Ethical issues and Do's & Don'ts**; Impact of Micro finance:** Introduction, Impact assessment, Impact Monitoring, Microfinance & Poverty Assessment Tools

UNIT-4
Back Office Operations: Understanding the role & importance of back office operations in an MFI, Customer Account Management, Overview of Management Information Systems; **Data Management; Skills for Success in MFI Roles:** Communication and Interviewing Skills/Borrower Profiling Skill • Counselling and Financial Advising Skills/Time Management Skill • Sales & Marketing Skills/Cross Selling Skills

Text Books:

1. Micro-Finance (Perspective and Operations) by IIBF (Macmillan Education),
2. Micro Fianace in India by K.G.Karmakar,
3. Banker to the Poor by Muhammad Yunus

Mutual Fund Operations
Paper Code: BFSI-204

Semester -2nd	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course Outcomes:

Mutual funds can play an important role in Indian Economy. The course aims to help the students in:

CO1. Understand different investment alternatives in the mutual fund industry
CO2. Understanding the extent to which Investors are protected
CO3. Analyze the Mutual fund Regulation
CO4. To provide an understanding of the complexities of mutual fund functions, both internally and externally
CO5. To provide participants with the knowledge of risks and rewards of investing in mutual funds

Course Contents:

Unit 1: Concept of Mutual Fund: features, advantages and disadvantages, key terms and concepts associated with mutual fund, Mutual fund schemes: open ended and close ended, operational flow of mutual fund, various types of mutual fund, Organizational structure of Mutual Fund: Asset Management Company, sponsor, custodian, procedure for setting up of a mutual fund, History and growth of mutual fund industry in India

Unit 2: NAV, computation of NAV, Entry and Exit load and their computation, Return from Mutual Fund investment, computation of return, Expense ratio and its computation, SEBI regulation for expense ratio

Unit 3: Mutual Funds in India – UTI Mutual Fund, SBI Mutual Fund, Other Mutual Funds, Systematic Plan: SIP, SWP, STP, Equity Linked Saving Schemes (ELSS), Offer document of Mutual Fund: SID, SAI, KIM, Content of offer document, annual report of Mutual Fund, content of Mutual Fund report, myths of mutual fund

Unit 4: Regulatory framework of mutual fund industry: Role of SEBI, SEBI guidelines for mutual funds, The SEBI (Mutual Funds) Regulations, 1996, RBI and Mutual Funds, AMFI: Objectives, role of AMFI in Mutual Funds, AMFI Registration, ARN

References:

1. K.G. Sahadevan and M.Thripairaju: "Mutual funds, data interpretation and Analysis" (Prentice Hall of India)
2. V.K. Avadhani: Marketing of Financial Services (Himalaya)
3. R.Gorden and Natarajan: Emerging scenario of Financial Services (Himalaya)
4. Fredman and Wiles: How Mutual Funds work (Prentice Hall of India)
5. H.Sadhak: Mutual Funds in India. (Response Books)

Vocational Practical

Paper Code : 205

1. Follow the work instructions and operating instructions
2. Understanding of account opening process
3. Understanding of operating standards and Standard Operating Procedures
4. Understand the list of documents for account opening
5. Understand the document verification process
6. Identification of errors
7. Escalation of errors
8. Execution of work

(Semester III)

CONSUMER BEHAVIOR

Paper Code: BFSI - 301

Semester -3rd	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course outcomes:
After the successful completion of the course; students will be able to:

CO1. Understand the behaviour and buying decision process of consumers.
CO2. Evaluate the impact of internal determinants on consumer behaviour.
CO3. Analyse the impact of external factors on consumer behaviour.
CO4. Apply various aspects of communication and diffusion of innovation in marketing.

Course Content

UNIT – I Introduction to consumer behavior: definition, factors influencing consumer behavior, marketing strategies and consumer behavior, consumer decision making process, importance of consumer behaviour; Indian consumers and their characteristics.

UNIT – II Attitude - models and theories of attitude, tri-component attitude model, behaviour intention model and change in attitude; Personality and self-concept: nature of personality, theories of personality (Freudian, Jungian, Neo-Freudian and Trait theory), personality and understanding consumer diversity.

UNIT – III Environmental influence: definition of culture, characteristics of culture, dynamism in culture, relevance of sub culture and cross culture on consumer behaviour; Indian culture and sub culture; Marketing strategies and problems related to cross culture. Social class – definition, determinants of social class, objective approach, composite –variable indices, social class mobility, applications of social class to consumption, family and life style, significance, family life cycle stages; Family-buying influences, applications of AIO studies.

UNIT – IV Consumer decision making: four views of consumer decision making; types of consumer purchasing decision; Basic models of decision making Engle-Kollatt-Blackwell model, Howard– Sheth model, Nicosia model; e-business and its effect on consumer decision making.

Text Books:

1. Consumer Behavior, Ramanuj Majumdar, Prentice Hall Of India
2. Consumer Behavior The Indian Context Concepts And Cases by S Ramesh Kumar, PEARSON INDIA
3. Understanding Indian Consumers by Durairaj Maheshwaran & Thomas Puliyel by Oxford University Press

BUSINESS COMMUNICATION
Paper Code: BFSI 304

Semester -3rd	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course Outcomes:

CO1. To discuss types of communication and their forms
CO2. To improve comprehension
CO3. To improve spoken English and ability to articulate ideas
CO4. To improve formal writing skills

Course Content:

UNIT-I INTRODUCTION**:** Definition and classification of communication, purpose of communication, process of communication, importance of communication in management, communication structure in organization, barriers and gateway in communication, 7 C's of communication, Impact of cross cultural communication

UNIT-II EMPLOYMENT COMMUNICATION: Writing CVs and Application Letter, Group discussions, interview, types of interview, candidates preparation, Interviewers preparation; Impact of Technological Advancement on Business Communication; Communication networks, Intranet, Internet, teleconferencing, videoconferencing ORAL COMMINICATION: What is oral Communication, principles of successful oral communication, two sides of effective oral communication, effective listening, non–verbal communication, Body language, Paralanguage.

UNIT-III WRITTEN COMMUNICATION: Purpose of writing, pros and cons of written communication, clarity in writing, principles of effective writing, writing technique. BUSINESS LETTERS AND REPORTS: Introduction to business letters, Types of business letter, Layout of business letter, Reports: definition and purpose, types of business reports, reports writing.

UNIT-IV GROUP COMMUNICATION- Meetings: need, importance and planning of Meetings, drafting of notice, agenda, minutes and resolutions of Meeting, writing memorandum, press release, press conference, Business etiquettes – netiquettes, telephonic and table etiquettes. PRESENTATION SKILLS: What is a

presentation: elements of presentation, designing a presentation, advanced visual support for business presentation, types of visual aid, appearance and posture, practicing delivery of presentation. CORPORATE COMMUNICATION: Definition, scope, importance and components of corporate communication, professional communicator responsibilities, corporate communication and Public Relation, role of social media in communication.

Text Books:

1. M.K. Sehgal and V. Khetrapal - Business Communication (Excel Books).
2. UrmilaRai, Business Communication, Himalaya Publishing House

Retail Banking Operations – I

Paper Code : BFSI 302

Semester -3rd	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course Outcomes:

After the successful completion of the course; students will be able to:

CO1. Get an introduction into Retail Banking, understand what this type of banking is and why it is becoming so important to bank now and moving forward.

CO2. Identify the different types of Retail banking Channels

CO3. Learn about the various retail banking products and how it is different from traditional banking products

CO4. Learn about various banking services and how these relate to retail banking

Course Content:

1. Retail Banking
   - Introduction to retail banking/Importance of retail line of business
   - dimensions of retail banking/Retail banking channels
2. Overview of products & services
   - Deposit products
   - Loan products

Depository Operations – I

Paper Code : BFSI-303

Semester -3rd	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course Outcomes:

After the successful completion of the course; students will be able to:

CO1. Learn about the capital market and its various elements
CO2. Understand the rationale for a depository
CO3. Know about the services provided by depository Participants
CO4. Learn about the compliance requirements related to account opening, transmission & Nomination

Course Content:

1. Introduction to the Capital Market
2. Introduction to Depository
3. Depository and its Business Partners
4. Functions of Depository Participant -Account Opening
5. Functions of Depository Participant - Transmission and Nomination

Vocational Practical
BFSI-306

1. Follow the work instructions and operating instructions
2. Understanding of account opening process
3. Understanding of operating standards and Standard Operating Procedures
4. Understand the list of documents for account opening

Computational Lab
BFSI-305

1. Basics of Computer System and its use in day to day life
2. Using Email, Fax, Printer, Mobile- inter connectivity
3. Basics of internet and web browsing

Level 6 (Semester IV)

INDIAN BUSINESS ENVIRONMENT

BFSI-401

Semester -4th	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course Outcomes:

After Successful completion of this course, the student will be able to:-

CO1: Develop ideas of the basic Indian Economy and nature of business environment & its components
CO2: Demonstrate and develop conceptual framework of business environment
CO3: Apply the trade theories, investment theories, exchange rate theories and their impact on economic welfare
CO4: Integrate the concept of Foreign trade, BoP, multiple trade policy and multilateral route (WTO).

Course Content

UNIT - I Nature, components and determinants of business environment; basic structure of Indian economy and growth trends; basic nature of Indian economic system and its impact on environment; social responsibility of business; Latest Economic Policy (Broad Features).

UNIT - II Trend and pattern of industrial growth; review of industrial policy developments; industrial licensing policy; Privatization, trends and issues for public sector, corporates competition bill; growth and problems of the small scale sector; Importance of SSI in Economy. RTI Act 2005: Purpose, Right to Information and Obligation of Public Authorities, Exemption from disclosure of information.

UNIT - III Development banking finance for corporate Sector – trends pattern and policy; regulation of stock exchanges and the role of SEBI; SEBI guidelines relating to fresh issues of companies; banking sector reforms; challenges facing public sector banks; growth and changing structure of non-bank financial institutions; problem of non-performing assets in India's financial sector.

UNIT - IV Trend and pattern of India's foreign trade and balance of payments; latest EXIM policy – mainfeatures; policy towards foreign direct investment; role of MNCs; India's policy commitments tomultilateral institutions – IMF, World Bank and WTO. Liberalization, Privatization and Disinvestments,Special Economic Zone (SEZ) and their role and impact on International Business Environment, World Trade Organization (WTO), Redefining Value Preposition to MSMEs

Text Books:

1. Business Enviornment by Geetika Gosh & Choudhary, Tata McGraw Hill Education
2. T.R. Jain & O.P. Khanna, Micro Economics, Global Publications

Retail Banking Operations – II

BFSI-402

Semester -4th	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course Outcome:

After the successful completion of the course, the student will be able to:-

CO1: Learn about the multiple third product available under retail banking

CO2: Understand the importance of Customer Relationship management

CO3: Analyze the income contribution of Retail Banking activities in total banking operation

CO4: Understand the various parties originated retail banking activities

Course Content:

1. Overview of products & services
   - Other third party products
   - Other services

2. Operations in retail banking accounts
   - Customer originated
   - Bank originated
   - Transactions originated by others

Suggested Readings:

1. Varshney, P.N., Banking Law and Practice, Sultan Chand & Sons.
2. Cox, David, Elements of Banking; John Murray.
3. Mehta, R.R.S., Fundamental of Banking; Himalaya Publiching House Co.
4. Nigam, B.M.L., Banking Law and Practice, Konark Publishers.
5. Retail Banking in India: P Aggarwal.
6. Retail Banking for CAIIB Examination: IIBF (Indian Institute of Banking and finance).

Depository Operations – II

BFSI - 403

Semester -4th	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course Outcomes:

After Successful completion of this course, Student will be able to:-

CO1: Gain the knowledge about the Dematerialization, Trading & Settlement function of DPs

CO2: Understand the activities related to Pledge, Hypothecation, Corporate action and their regulatory requirements

CO3: Learn About the procedure, advantages & types of Public Issues

CO4: Get the insight about BSDA account, how it is different from General Dmat account and advantages of BSDA

Course Content:

1. Functions of Depository Participant -Dematerialization
2. Functions of Depository Participant -Trading and Settlement
3. Pledge and Hypothecation
4. Corporate Action
5. Public Issues
6. Basic Services Demat Account (BSDA)

Suggested Readings:

1. Depository Operations, by National Institute of Securities Markets(NISM)
2. Capital Market & Depository System in India by Regina Sibi Cleetus, K Sashikumar

ORGANIZATIONAL BEHAVIOR
BFSI-404

Semester -4th	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course outcomes:

After the successful completion of the course, students will be able to:

CO1. Understand the theoretical frameworks for OB

CO2. Analyse the behaviour of individual employees and its implications for the organisation.

CO3. Developing a critical insight into group and team dynamics.

CO4. Interpret the influence of various organisational development and change on the behaviour of the employees.

Course Content

UNIT - I Organization Behavior: Concept, foundations of Organization Behavior, Theoretical frameworks for OB; Contemporary Challenges to OB in 21st Century.

UNIT - II Group Dynamics: Types of Groups, Reason for the Formation of Group, Group Cohesiveness, Group Conflicts, Team Building; Individual Differences: Causes of Individual Differences. Perception: Concept, Perceptual selectivity, Managerial implications of Perception

UNIT - III Conflict: Meaning, Process of Conflict, Types of Conflicts: - Individual, Group and Organizational Level. Change: Concept, Resistance to Change, Management of Change, Role of Change Agent, Stress – Causes, Effects and Coping Strategies;

UNIT - IV Power and Politics: Leadership – Concept; Theories; [Trait (IOWA), OHIO State Leadership Studies, Path Goal Leadership Theory, McGregor's Theory X and Theory Y, Charismatic Leadership; Transformational Leadership; Leadership Styles; Roles and Activities of Leadership, Leadership Skills; Organizational Culture (Definition, Characteristics of an organization's culture, types of culture, role of culture, Negative effects of culture).

Text Books:

1. Kavita Singh, Organisational Behaviour: Text and cases. New Delhi: Pearson Education
2. C.B. Gupta, Organisational Behaviour, S. Chand Publishing

Vocational Practical
BFSI-406

1. Follow the work instructions and operating instructions
2. Understanding of account opening process
3. Understanding of operating standards and Standard Operating Procedures
4. Understand the list of documents for account opening

Computational Lab
BFSI-405

1. MSOffice, Tally and Excel
2. Purposive surfing
3. Cyber Security Basics-Virus, Hacking, Spamming, online data and identity theft, Awarenessabout IT Acts, types of Cyber Crimes

(Semester V)

Business Banking &Operations

BFSI-501

Semester -5th	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course Outcome:

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

CO1: Learn about business banking and its characteristics & advantages

CO2: Understand the main areas of MSME banking where best-practices are essential for success

CO3: Apply the knowledge of regulatory requirements related to SME & MSME banking

CO4: Understand the role of banker in helping the SME business in facing the prevailing industry challenges

Course Content:

1. Understanding Business Banking
   a. Definition & characteristics
   b. Accounts & deposits
   c. Lending products
   d. Other services – treasury, trade & forex
2. SME: Definition & characteristics, RBI & GoI directives
3. Role of Bankers
4. Challenges in SME Business

Securities Operations

BFSI-502

Semester -5th	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course Outcome:

After successful completion of the course, the student will be able to:

CO1: Learn about the various participants in securities market.
CO2: Understand the operation related to front office management & back office management
CO3: Apply the knowledge related different process of Clearing, settlement & Grievances
CO4: Gain the knowledge about risks involved in securities marketing and their efficient management

Course Content:

1. Introduction to the Securities Market
2. Market Participants in the Securities Market
3. Introduction to the Securities Broking Operations
    - Trade life cycle
    - Front office operations
    - Risk management practices
    - Surveillance mechanism
    - Back-office operations
4. Risk Management
5. Clearing Process
6. Settlement Process
7. Investor Grievances and Arbitration
8. Other Services Provided by Brokers

ADVERTISING AND SALES MANAGEMENT
Paper Code: BFSI-503

Semester -5th	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course Outcome:
After successful completion of this course, the student will be able to:-

CO1: Demonstrate an understanding of the overall role advertising plays in the business world.
CO2: Demonstrate an understanding of advertising strategies and Budget.
CO3: Demonstrate an understanding of various advertising media and how an advertising agency operates.
CO4: Describe different types of sales force and steps involved in sales force management

Course Content:
Unit - I Advertising: definition, nature, scope, objectives, types, social and economic aspect of advertising, relationship with product life cycle. Advertising as a communication process: concept of integrated marketing communication; AIDA model, Laivdge–Stenier model of communication. Advertising campaign: types, planning and managing advertising campaign, advertising strategies. Advertising budget: budget process, administering the budget.
Unit - II Media: Types, Media Planning process, Media Selection, and Multi-Media Strategies. Copywriting: Guidelines for copywriting, Copywriting for print, Audio, TV and outdoor media. Advertising layout: Components and its position. Evaluation of Advertisements: Measuring advertising effectiveness. Advertising Agencies: Structure, Functions and Client Relationship, Laws and ethics of advertising in India.

Unit - III Sales Management: Objectives, Selling process, Personal Selling objectives, Determining Salesrelated marketing Policies. Sales organization structures: Types of sales organization structure, Relationship of sales department with other departments, Distributive network relations.
Unit - IV Sales Force Management: Recruiting and selecting sales personnel, Training sales force Motivating Sales Personnel, Compensating Sales Personnel, Managing expenses of sales personnel, Staffmeeting and Sales Contests. Controlling the Sales Force: Sales Budget, Sales Quotas, Sales rritories, Salescontrol and cost analysis.
Text Books: 1. Advertisement and Sales Management, Mukesh Trehan & Ranju Trehan, V.K Publications
2. Advertisement and Sales Promotion, SHH Kazmi & Satish K. Batra, Excel books

SERVICE MARKETING
Paper Code: BFSI-504

Semester -5th	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course outcomes:

After the completion of the course, the students will be able to

CO1. Learn to create customer value by apply services marketing concepts and principles

CO2. Understand unique challenges and opportunities of services marketing

CO3. Measure and manage service quality by using GAP model and SERVQUAL scale

CO4. Understand the significance of people, process and physical evidence in context of Services

Course Content

UNIT - I Foundation of Service Marketing: definition and concept of service marketing, distinctive characteristics and classification of services, growth in service, service marketing mix, emergence of service economy.

UNIT - II Customer Focus: understanding customer needs and expectations, process of market segmentation, selecting customer portfolio, creating valued relations with customer; Customer loyalty, service encounters, measuring customer satisfaction, handling complaints, service failure and recovery; Designing and delivering services: positioning a service in the market, value addition to service product, planning and branding service product.

UNIT - III New service development: pricing the service product, advertising, personal selling and other communication in services industry; Challenges in distribution of services; Role of employees, customers and intermediaries in service industry.

UNIT – IV Special Issues in Service Marketing: e-services; Online consumer behaviour; Self-service technologies; Understanding specific service industries: Marketing of Financial Services, Marketing of Hospitality and Tourism Services, Marketing of Educational Services.

Text Books:

1. Service Marketing, V. A. Zeithmal, D.D. Gremler, M.J. Bitner, Ajay Pandit, TataMcGraw Hill
2. Lovelock, C., Wirtz, J. and Chatterjee, J., Service Marketing – People, Technology, Strategy, Pearson Education, New Delhi

Vocational Practical

BFSI-506

1. Follow the work instructions and operating instructions
2. Understanding of account opening process
3. Understanding of operating standards and Standard Operating Procedures
4. Understand the list of documents for account opening
5. Understand the document verification process
6. Identification of errors
7. Escalation of errors
8. Execution of work

Level 7 (Semester VI)

Life Insurance Operations

Paper Code: BFSI-601

Semester -6th	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course Outcome:

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

CO1: Compare and contrast the types of life assurance available in the market.
CO2: Explain the legality and administrative issues of life policies
CO3: Applying the life assurance knowledge and skills in different scenarios.
CO4: Interpret the regulatory and documentation framework governing life assurance
CO5: Apply the marketing strategies related to Life Insurance Products.

Course Content:

1. Introduction to Insurance
   - Definition, characteristics, need & importance/Advantages of insurance
2. Principles of Life Insurance
   - Principle of utmost Good Faith/Insurable Interest/Principle of Indemnity
3. Premium and Bonuses
   - What is Premium/Premium calculation and Actuarial valuation/What is Bonus
4. Life Insurance Product
   - Traditional / Unit Linked Policies; Individual and Group Policies
   - With Profit and Without Profit/Whole Life Products, Interest sensitive product
   - Term Assurance/Annuities, Endowment Assurance etc.
5. Underwriting
   - Introduction/Classification of Risks/Financial Underwriting
6. Insurance Documents
7. Policy Conditions
8. Claims
9. Group Insurance
10. Life Insurance Marketing

General Insurance &Operations

BFSI-602

Semester -6th	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course Outcome:

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

CO1: Compare and contrast the types of General Insurance available in the market.
CO2: Explain the legality and administrative issues of General policies
CO3: Applying the General assurance knowledge and skills in different scenarios.
CO4: Interpret the regulatory and documentation framework governing General Insurance
CO5: Apply the knowledge of different General Insurance Products.

Course Content:

1. Introduction to Insurance
   - Definition, characteristics, need & importance; Advantages of insurance

2. Principles of General Insurance
3. Key Insurance Documents
   - Proposal Forms/Policy Forms/Cover Notes/Certificate of Insurance/Endorsements
   - Renewal Notice/Other Insurance Documents

4. Theory & Practice of Rating
5. Different Types of Insurance
   - Fire Insurance/Marine Insurance/Motor Insurance/Personal Accident Insurance
   - Liability Insurance/Health Insurance/Miscellaneous Insurance

BUSINESS POLICY AND STRATEGIC MANAGEMENT

Paper Code: BFSI-603

Semester -6th	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course Outcome:

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

CO1: Describe major theories, background work, concepts and research output in the field of strategic management.

CO2: Demonstrate a clear understanding of the concepts, tools & techniques used by executives in developing and executing strategies and will appreciate its integrative and interdisciplinary nature.

CO3: Demonstrate effective application of concepts, tools & techniques to practical situations for diagnosing and solving organizational problems.

CO4: Demonstrate capability of making their own decisions in dynamic business landscape.

CO5: Develop their capacity to think and execute strategically.

Course Content:

UNIT - I Introduction to Business Policy & Strategic Management: Definition, Concept, Objective and Significance, the levels at which strategy operates, characteristic of Strategic Management; Strategic Management Process – Vision, Mission, Environmental Scanning; Concept of Strategic Decision Making.

UNIT - II Environmental Analysis: Need, Characteristics and categorization of Environmental Factors, Approaches to the Environmental Scanning Process – structural Analysis of Competitive Environment, ETOP – A Diagnosis Tool. Analysis of Internal Resources: Strengths and Weaknesses, Resource Audit, Strategic Advantage Analysis: Value – Chain Approach to Internal Analysis, Methods of Analyzing and Diagnosing Corporate Capabilities – Functional Area, Profile and Resource Deployment Matrix, Strategic Advantage Profile, SWOT Analysis.

UNIT - III Formulation of Strategy: Formulating Long Term Objectives and Grand Strategies, Long Term Objectives: Qualities of Long-term objectives, Grand Strategies: Concentration, Market Development, Product Development, Innovation, Horizontal and Vertical Integration, Joint Venture, Concentric and Conglomerate Diversification, Retrenchment / Turnaround, Divestiture, Approaches to Strategy, Major Strategy Options – Stability, Growth and Expansion, Diversification, Retrenchment, Mixed Strategy. Evolution of Multinational Environment – Strategic Considerations for Multinational Firms, Why companies Internationalize, Problems for MNC, Strategic Planning for MNC, Components of Multinational Environment, Selection of long-term Objectives and Grand Strategy Sets, Sequence of Objectives and Strategic Selection.

UNIT – IV Choice of Strategy - BCG Growth/Share Matrix; Stop Light Strategy Model, Directional Policy Matrix (DPM) Model, Grand Strategy Selection at the Business level – Grand Strategy Selection Matrix, Model of Grand Strategy Clusters, Behavioral consideration affecting strategic choice, contingency approach to Strategic choice, Product / Market Evolution – Matrix and Profit Impact of Market Strategy (PIMS) Model.

Text Books:

1. Strategic Management – Azhar Kazmi, Tata McGraw Hill

HUMAN RIGHTS AND VALUES
Paper Code: BFSI-604

Semester -6th	Internal – 25 Marks
Stream–BFSI	External – 75 Marks
L T P Total Credits	Total:- 100 Marks
3 0 0 3	Duration of Exam: 3Hours

Course Outcome:

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

CO1: Work independently and carry out a professional and original work in the field of human rights, in NGOs, international organizations, ministries and state agencies that address human rights

CO2: Work in conjunction with human rights specialists and other scholars in expanding knowledge about human rights as well as promoting respect for the values they embody and symbolize

CO3: Communicate your acquired skills in the field of human rights through teaching as well as legal action and policy-making.

CO4: Pursue an academic career in human rights

Course content:

Unit – I Concept of Human Rights, Indian and international perspectives of Human Rights, Evolution of Human Rights, Human Rights movements in India, Classification of Human Rights and Relevant Constitutional Provisions to Right to Life, Liberty and Dignity, Right to Equality, Right against Exploitation, Cultural and Educational Rights, Economic Rights, Political Rights and Social Rights

Unit – II Deprivation of Human Rights – Core Issues: Poverty, overpopulation, illiteracy, Problems of Unsustainable Development, Disadvantaged Groups – (a) Women (b) Children (c) Scheduled Castes and Scheduled Tribes (d) Homeless and Slum Dwellers (e) Physically and Mentally Handicapped f. Refugees and Internally Displaced Persons

Unit - III Redressal Mechanisms for Human Rights Violations: Violation of Human Rights by State. Violation of Human Rights by Individuals and groups, NuclearWeapons and terrorism. Government systems for Redressal, Judiciary, National Human Rights Commission and other Statutory Commissions, Media Advocacy, Creation of Human Rights Literacy and Awareness

Unit – IV Concept of Human Values: Aim of education and value education; Evolution of value oriented education; Concept of Human values; types of values; Components of value education. Character Formation Towards Positive Personality - Truthfulness, Sacrifice, Sincerity, Self-Control, Altruism, Tolerance, Scientific Vision; Value Education towards National and Global Development, National Integration and international understanding.

Text Books:

1. Human Rights & Values, Dr. Anjali, Mahavir Publication.

MINOR PROJECT (BFSI – 605)

J.C. Bose University of Science & Technology, YMCA, Faridabad
(A Haryana State Government University)
(Established by Haryana State Legislative Act No. 21 of 2009 & Recognized by UGC Act 1956 u/s 22 to Confer Degrees)
Accredited 'A' Grade by NAAC

COMMUNITY COLLEGE OF SKILL DEVELOPMENT

Program B. Voc. BFSI (Program Code: 255)

Revised Scheme Course Index of the Year 2020-21 (BOS Dated 18/05/2021)

Mapping of the Courses with the Employability/Entrepreneurship/Skill Development

S. No.	Course Code	Course Name	Skill Development	Entrepreneurship	Employability
1	BFSI-101	Banking & Micro Finance	✓		✓
2	BFSI-102	Indian Securities Markets	✓		✓
3	BFSI-103	Foundations of Management	✓		✓
4	BFSI-104	Business Economics	✓		✓
5	BFSI-105	Communication Practical	✓	✓	
6	BFSI-106	Vocational Practical	✓	✓	✓
7	BFSI-201	Marketing Management	✓		✓
8	BFSI-202	Human Resource Management	✓		✓
9	BFSI-203	Micro Finance Operations	✓		✓
10	BFSI-204	Mutual Fund Operations	✓		✓
11	BFSI-205	Vocational Practical	✓	✓	✓
12	BFSI-301	Consumer Behavior	✓		✓
13	BFSI-302	Retail Banking & Operations –I	✓		✓
14	BFSI-303	Depository Operations – I	✓		✓
15	BFSI-304	Business Communication	✓	✓	
16	BFSI-305	Computational Lab	✓	✓	✓
17	BFSI-306	Vocational Practical	✓	✓	✓
18	BFSI-401	Indian Business Environment	✓		✓
19	BFSI-402	Retail Banking & Operations –II	✓		✓
20	BFSI-403	Depository Operations – II	✓		✓
21	BFSI-404	Organizational Behavior	✓		✓
22	BFSI-405	Computational Lab	✓	✓	✓
23	BFSI-406	Vocational Practical	✓	✓	✓
24	BFSI-501	Business Banking & Operations	✓		✓
25	BFSI-502	Securities Operations	✓		✓
26	BFSI-503	Advertising and Sales Management	✓		✓
27	BFSI-504	Service Marketing	✓		✓
28	BFSI-506	Vocational Practical	✓	✓	✓
29	BFSI-601	Life Insurance & Operations	✓		✓
30	BFSI-602	General Insurance & Operations	✓		✓
31	BFSI-603	Business Policy and Strategic Management	✓		✓
32	BFSI-604	Human Rights and Values	✓	✓	
33	BFSI-605	Minor Project	✓	✓	✓

Principal, CCSD

Annexure – “B”

SCHEME OF EXAMINATION

and

SYLLABUS

for

Bachelors in Vocation (B.Voc)

in

AUTOMOBILE

Offered by

Community college of skill development

J C Bose University of Science & Technology YMCA

Sector-6, Mathura Road, Faridabad, Haryana, India

2020-21

ABOUT THE PROGRAM

The B.Voc. Degree in Automotive Technology runs with a mission to impart knowledge, technical skills & hands-on training in automobiles, focusing on four wheelers & three wheelers, both petrol & diesel, and two wheelers. This program is an outcome of industry and student demand. Only Degree program in Automotive Technology with more than 80% Practical to make you more employable and outshine your career. This program is designed to introduce the students to the operation of today's complex vehicles by giving them a comprehensive understanding from basic to advance, of various automotive systems like transmission, brakes, steering, suspension, electrical & electronics, and engine performance, etc. Students under this program will acquire the necessary skills to diagnose and repair mechanical and computer controlled electronic systems on the latest models of automobiles. Vocational training programs have been created with the aim of imparting industry-specific skills in students. These programs are crafted in such a way that the students acquire skills, which will lead them to employment in the respective sector.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO-1: To train students with practical skills and experimental practices related to core and applied areas of Automobile Engineering to expand their knowledge horizon beyond books and make them industry ready.

PEO-2: To enable students to service, design and maintain automotive equipments which are useful for the industries.

PEO-3: To improve team building, team working and leadership skills of the students with high regard for ethical values and social responsibilities.

PEO- 4: To enable students to communicate effectively and efficiently.

PROGRAMME OUTCOMES (POs)

After completion of the program, the student will:

1) Be trained to NSQF level 7 in at least one job/profile in the field of automotive skills.
2) Be trained for multiple skill sets under the domain of automotive skills like Body repair, refinish painting technology, wheel care, engine emission system, automotive electrical circuit designing, vehicle dynamics etc.
3) Be able to supervise the various automotive workshop floors for mechanical shop, wheel care, body & paint repair.
4) Be trained & equipped with knowledge and understanding to start his/her own enterprise in automotive sales and services.
5) able to develop skills in management of customer issues, analysis and evaluation mechanical, electrical and electronics faults.
6) Plan and set his/her enterprise/agency for repair and overhaul of engines and power trains, repair of suspension and steering system, wheel maintenance or spare parts business of any automotive OEM.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

1) To apply practical skills, vocational training and knowledge of automobile servicing fundamentals to industries.
2) The student will be ready and skilled to take-up career or to pursue higher studies with high regard to ethical values and social responsibilities.

SYLLABUS & SCHEME OF EXAMINATION

Year	FIRST SEMESTER			SECOND SEMESTER		
	Course	**Code**	**Credit**	**Course**	**Code**	**Credit**
I	Communication Skills	BSC-101	3	Employability Skills	BSC-206	3
	Engineering Calculations	BSC-102	3	Applied Science	PCC-AM-205	3
	Engineering Science	PCC-AM-106	3	Quality, inspection and Safety	PCC-AM-202	3
	Motor Vehicle Techonolgy-1	PCC-A-101	3	Elements of Automobile Engg	PCC-AM-203	3
	Automobile Workshop-1	PCC-AM-103	18	Automobile Workshop-2	PCC-AM-204	18
	Total		30	Total		30
	Cumulative Credits = 60 DIPLOMA					
	NSQF LEVEL - 5 JOB ROLE - AUTOMOTIVE SERVICE TECHNICIAN (ASC/Q1403)					
Year	**THIRD SEMESTER**			**FOURTH SEMESTER**		
II	Motor Vehicle Technology-2	PCC-AM-303	3	On Job Training (OJT)/ Internship evaluation including report and presentation	PCC-AM-401	30
	Automobile Electrical Equipment	PCC-AM-304	3			
	IT Tools	PCC-AM-306	3			
	Soft Skills	BSC-301	3			
	Automobile Workshop-3	PCC-AM-305	18			
	Total		30	Total		30
	Cumulative Credits = 120 ADVANCED DIPLOMA					
	NSQF LEVEL- 6 JOB ROLE - AUTOMOTIVE SERVICE TECHNICIAN (ASC/Q1404)					
Year	**FIFTH SEMESTER**			**SIXTH SEMESTER**		
III	On Job Training (OJT)/ Internship evaluation including report and presentation	PCC-AM-501	30	Entrepreneurship	BSC-601	3
				Vehicle Performance and Testing	PCC-A-605	3
				Industrial Management	PCC-A-603	3
				Project	BSC-602	3
				Automobile Workshop-4	PCC-AM-606	15
				Electives (choose any one)		3
				Alternative Fuels & Emission Control*	PCC-A-604	
				Vehicle Body Engineering*	PCC-A-608	
				Autotronics*	PCC-A-607	
	Total		30	Total		30
	Cumulative Credits = 180 B.VOC					
	NSQF LEVEL - 7 JOB ROLE - SERVICE SUPERVISOR (ASC/Q1412)					

FIRST SEMESTER

MOTOR VEHICLE TECHNOLOGY – I

Semester 1st
Stream– Automobile
L T P Total Credits
3 0 0 3

Sessional – 25 Marks
Theory – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. To introduce about automobile basics.
2. To understand about suspension and steering system.
3. To study about automobile wheels and tyres.

UNIT-I

Introduction: Classification of automobiles- according to number of wheels, propulsion systems, transmission drives, type of fuels, application & capacity, study of main specifications. Components of an automobile- functions & layout of frame, frameless construction, axles, introduction of steering system, suspension system, braking system, power train & drives, clutch, gear box, final drive, propeller shaft, u-joints, vehicle body, wheels, tyres & tubes.

UNIT-II

I C Engine: Classification of heat engine, constructional & working details of two strokes & four stoke petrol & diesel engines, different parts of internal combustion engine, applications and types, power and efficiency.

UNIT-III

Suspension System: Need of suspension, principle and function of suspension system, sprung and un-sprung mass, types of suspension systems, constructional details, suspension springs, characteristics of leaf spring, coil spring, rubber spring, air spring and torsion bar, Introduction to independent suspension, front & rear suspension systems of the vehicle, anti-roll bar, shock absorbers.

UNIT-III

Steering System: Steering system- requirements, front axle details & steering geometry, castor, camber, toe in, toe out steering axis inclination, steering linkages, and different types of steering gear boxes, their constructional & working details. Concept and working of power steering.

UNIT-IV

Wheels and Tyres: Road-wheels - Rim types and sizes, Tyres-conventional, radial, Tubeless tyre its advantages, Tyre sizes, wheels-front and rear, Tyre retreading, Tyre wear, wheel balancing, Tyre pressure, Advantages of filling nitrogen in tyres.

Course Outcomes:

1. To learn various components of automobile.
2. To improve understanding about power unit of automobile.
3. To acquire knowledge about steering and suspension system.
4. To be able to check wheel unbalances.

Reference Books:

1. Automobile Engineering, R.K. Rajput, Laxmi Publications.
2. Automobile Mechanics, A.K. Babu, S.C. Sharma, T.R. Banga, Khanna Publishing House
3. Automobile Engineering by Dr. Kripal Singh

ENGINEERING SCIENCE

Semester 1st
Stream– Automobile
L T P Total Credits
3 0 0 3

Sessional – 25 Marks
Theory – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. To learn about measurement devices.
2. To understand law of motion and friction.
3. To study about thermodynamics.
4. To learn about fuel and its classifications.

UNIT I: Units and Measurements

Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures. Dimensions of physical quantities, dimensional analysis and its applications.

UNIT II: Laws of Motion

Intuitive concept of force, Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion.

Law of conservation of linear momentum and its applications.

Equilibrium of concurrent forces, Static and kinetic friction, laws of friction, rolling friction, lubrication. Dynamics of uniform circular motion: Centripetal force, examples of circular motion.

UNIT III: Thermodynamics

Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; Cp, Cv - calorimetry; change of state - latent heat

capacity. Thermal equilibrium and definition of temperature (zeroth law of thermodynamics), heat, work and internal energy. First law of thermodynamics, isothermal and adiabatic processes.
Second law of thermodynamics: reversible and irreversible processes, Heat engine and refrigerator.

UNIT IV: Fuel and their Classification

Definition, characteristics, classification into solid, liquid and gaseous fuel, Petroleum and brief idea of refining into various factions and their characteristics and uses, Calorific value of fuel, Gaseous fuels- preparation, properties, composition and use of producer gas, water and oil gas.

UNIT V: Pollution & its Control

Air Pollution: Types of pollutants, source effects, sink and control of primary pollutants – CO, No_x, HC, So_x and particulates, effects of pollutants on man and environment – photochemical smog and acid rain. Water Pollution: Classification of pollutants, their sources, waste water treatment – domestic and industrial. Soil Pollution: Composition of soil, classification and effects of soil pollutants and their control. Hazardous Wastes: Classification – radioactive, biomedical and chemical, treatment and disposal – physical, chemical and biological processes.

Course Outcomes:

1. To learn about unit and dimensions.
2. To improve understanding about motion and its laws.
3. To acquire knowledge about thermodynamics.
4. To be able to understand about pollution and its control.

Reference Books:

1. Thermodynamics by P K Nag
2. Environmental pollution and control engineering: C. S. Rao
3. Hand book of industrial metrology – John W. Greve, Frank W. Wilson,PHI – New Delhi
4. Engineering Metrology – K.J. Hume, Macdonald and Co.(publisher) London

COMMUNICATION SKILLS

Semester -1st	Sessional – 25 Marks
Stream–Automobile	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To discuss types of communication and their forms
2. To improve comprehension
3. To improve spoken English and ability to articulate ideas
4. To improve formal writing skills

Unit 1: Introduction to Communication: Meaning, Importance and Function of Communication, Types of communication, language of communication; advantages and disadvantages; Barriers to Communication; Organizational Communication

Unit 2: Grammar: Parts of speech, Articles, Tenses, Formation of Sentences, Active and Passive Voice, Direct and Indirect speech

Unit 3: Writing and Comprehension: Comprehension, Composition, Translation, Paraphrasing, Letter writing

Unit 4: 7 Cs of Communication; Grice's Cooperative Principle; Group Discussions; Public Speaking; Facing Interviews

Course Outcome:

1. To learn about communication process and ways to make communication effective by giving attention to all elements involved.
2. To improve grammar and gain confidence by enhancing their abilities to articulate their ideas.
3. To acquire better writing skills in formal communication.
4. To be able to revise documents for fruitful reading and comprehension.

Reference books:

1. Wren and Martin. *High School English Grammar and Composition.* New Delhi: RRP, 2007
2. Murphy, Raymond. *Essential English Grammar*. New Delhi: Cambridge, 2017

ENGINEERING CALCULATIONS

Semester - 1st	Sessional – 25 Marks
Stream–Automobile	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives

1. To familiarize the prospective engineers with Basics of mathematics
2. To understand fundamental arithmetical operations.
3. To learn Unit systems, Fractions and Decimals, roots, percentage.
4. To have Knowledge of differential quantities

Course Contents

Unit-I: Basic Aptitude- Fundamental Arithmetical Operation- Addition, Subtraction, Multiplication and Division. Applied Workshop Problems Involving Addition, Subtraction, Multiplication and Division, System Of Units – Definition, Different Types & System Of Units i.e.(C.G.S. & SI Units for Length, Mass, Area, Volume, Capacity, Time) HCF, LCM, Square Root Cube Root.

Unit-II: Trigonometry – Introduction, Trigonometric Identities, Quadrant Rule, Trigonometric Ratios of Some Specific Angles, Ratios of Complementary Angles.

Unit-III: Differentiation- Introduction to Derivatives, Product Rule, Quotient Rule, Chain Rule, Derivatives of Algebraic Function, Derivative of Trigonometric Functions.

Unit –IV: Integration: Concepts of integration, integration of trigonometric, exponential and logarithmic functions, integration by parts.

Unit-V: Algebra- Algebraic Expressions and Identities, Terms Coefficients and Factors, Monomials Binomials and Polynomials, Multiplication and Division of Algebraic Expressions, Standard Identities and Their Applications.

Course Outcomes:

1. To Apply the Arithmetical Operations And Conversion Of Units.
2. To Convert in Fraction And Decimals, Percentage.
3. To Solve HCF, LCM , Square Roots And Cube Roots.
4. To Deal With Differential Problems.
5. To Learn About Trigonometric Ratios.

Reference Books:

1. Mathematics Book by R.D Sharma
2. Advanced Engineering Mathematics By Jain Rk.
3. A Basic Course in Mathematics By Nabjyoti Dutta.
4. Skills in Mathematics By Amit M Aggarwal.
5. Applied Mathematics for Polytechnics By H.K. Dass.

AUTOMOBILE WORKSHOP-1

Job Role- Automotive Service Technician Level 4 (ASC/Q 1402)

Semester 1st Sessional – 25 Marks

Stream– Manufacturing
L T P Total Credits
18 0 0 18

Theory – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. To introduce about automobile basics.
2. To understand repairing of suspension and steering system.
3. To study the repairing of automobile wheels and tyres.
4. To perform the vehicle overhaulining.

A. To understand the functioning of various components and aggregates of the vehicle

To be competent, the user/individual on the job must be able to:

1. understand the auto component manufacturer specifications related to the various components/ aggregates in the vehicle, engines and fuel system (diesel, petrol, electrical, gas, hybrid etc.) , cooling system , air supply systems, emission and exhaust system, ignition systems, clutch assembly, clutch operating system, gearbox (manual and automatic), drivelines and hubs, drive-train assembly and transmission systems (manual, automatic etc.), steering system, suspension system, brake system (including regenerative braking systems), tyres and wheels (including wheel alignment), radiator, batteries and power storage system.
2. o electrical wire harness, lighting, ignition, electronic and air-conditioning systems etc.
   o electronic systems including active and passive safety, media and other systems
   o various lubrication systems.
3. To understand the functioning of each system, component and aggregate (including both mechanical and electrical aggregates) of a vehicle.
4. To understand the tools used to assess and confirm technical faults that cannot be determined through a visual inspection.
5. To ensure any malfunctions observed in tools and equipment are reported to the concerned persons.
6. To understand the various values and tolerance limits of various components across the mechanical/ electrical aggregates.

B. Assessing service and repair requirements

To be competent, the user/individual on the job must be able to:

available for assessing service and repair requirements of the vehicle including: diagnostic displays, visual inspections, test drives, vehicle/equipment manufacturer specifications,

standard operating procedures for diagnosis, understand typical symptoms of common technical faults in a vehicle

C. Assist in the diagnosis of the root cause of the vehicle trouble

To be competent, the user/individual on the job must be able to:

1. To follow standard operating procedures for using workshop tools and equipment for fault diagnosis or troubleshoot problem in a vehicle
2. To review the job card and understand customer complaints, follow standard operating procedure set out for diagnosing faults.
3. To follow instructions of seniors for specific tasks related to diagnosing faults in the various sub-assemblies and aggregates in a vehicle.
4. To use checklists and standard OEM operating procedures to understand if the fault is because of improper servicing, or low levels of oils, coolants, grease etc. or poor quality oil/ air filters etc.
5. To ensure any malfunctions or repair requirements observed in vehicles (and beyond own scope of work) are reported to the concerned person.
6. To understand the various precautions to be taken to avoid damage to the vehicle and its components while working on diagnosis or troubleshooting the vehicle for any faults.

D. Functioning of various components and component systems

To be competent, the user/individual on the job must be able to:

1. to understand the basic technology used in and functioning of various components and component systems of the vehicle including: o engines and fuel system (diesel, petrol, electrical, gas etc.)
2. to understand the tools used to assess deviations from specifications during routine servicing.

E. Carry out routine service and minor repairs of mechanical & electrical aggregates

To be competent, the user/individual on the job must be able to:

1. To calibrate, align and adjust settings, alignment and other routine service and maintenance of various parts and aggregates including: o engine and aggregates o other engine sub-assemblies like turbocharger, radiator etc. o gear box and it aggregates o propeller shafts and other transmission systems o clutch and brake systems and sub-assemblies o chassis o electrical and electronic components steering systems o suspension system o other components (including to valves, ignition, fuel and emissions, transmission, lights, tyres, steering and body fittings)

2. To ensure that for routine maintenance and service, the correct spare parts and appropriate grade of lubricants, coolant, oils and grease required have been obtained ensure all dismantled components (including mechanical and electrical aggregates) are cleaned and conditioned prior to reassembly.
3. To understand the various precautions to be taken to avoid damage to the vehicle and its components while working on other aggregates.
4. To record all service and repairs carried out and ensure completeness of tasks assigned before releasing vehicle for the next procedure.
5. To ensure all workshop tools, equipment and workstations are adequately maintained by carrying out scheduled checks, calibration and timely repairs where necessary

Course Outcomes:

1. To introduce about the automobile and its classifications.
2. To improve understanding about different parts of automobile and their functions.
3. To learn vehicle repairing.
4. To be able to rectify about vehicle pollution and do its control.

SECOND SEMESTER

ELEMENTS OF AUTOMOBILE ENGINEERING

Semester -2nd	Sessional – 25 Marks
Stream– B.Voc	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course objectives:

1. To study the chassis layout.
2. To study different types of clutches.
3. To learn the concepts of braking system.
4. To understand fuel supply and ignition suystem.

Course contents:

UNIT-1: Introduction & chassis layout: General study of the motor vehicle with functions of its main components and assemblies (engine excluded), Conventional layout of chassis Front wheel drive, four-wheel drive, rear engine vehicle, their advantages and disadvantages, Layout of Maruti car chassis and tractor chassis, Definitions of items-wheel track, wheel base, front and rear overhang, kerb weight, ground clearance.

UNIT-2: Fuel and Ignition Systems Fuel system – Different circuits in two wheeler fuel systems, fuel injection system. Lubrication system, Ignition systems - Magneto coil and battery coil spark ignition system, Electronic ignition System, Starting system - Kick starter system – Self-starter system, Recent technologies.

UNIT-3: Braking System: Need and classification of brakes, drum brakes and disc brakes, constructional & working details, introduction to hydraulic brake, parking brake, vacuum assisted hydraulic brakes, air assisted hydraulic brakes, air brakes, leading & trailing brake shoes, self-energizing brakes & ABS, working of master cylinder, wheel cylinders, tandem master cylinder, characteristics of brake fluid.

UNIT-4: **Clutch system:** Layout of conventional transmission system, clutch - necessity, functions, requirements, types, Constructional details and working of single plate, multiple plate, diaphragm clutches, fluid coupling, Centrifugal and semi-centrifugal clutch, Clutch pedal free play, Clutch defects, probable causes, remedies.

UNIT-5: Automobile pollution and its control: Effects and extent of pollution caused due to stationary and automobile engines. Harmful products and their causes in petrol & diesel engines. Measures to control exhaust emissions.

Course Outcomes:

Students will able

1. To identify different chassis layout.
2. To learn about different types of clutches.
3. To understand the concepts of braking system.
4. To understand fuel supply and ignition suystem.

Text Book(s):

1. K.K. Jain, R.B. Asthana, "Automobile Engineering", Tata McGraw Hill, New Delhi
2. Dr. Kirpal Singh, "Automobile Engineering (Vol-1)", Standard Publisher Distributors.
3. K.K. Ramalingam, "Automobile Engineering", Scitech Publication, Chennai
4. Tom Denton, "Automobile Mechanical and Electrical Systems" Indian Ed., Routledge (T&F Group) Pub.

QUALITY, INSPECTION AND SAFETY

Semester -2nd
Stream– B.Voc
L T P Total Credits
3 0 0 3

Sessional – 25 Marks
Theory – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course objectives:

1. To understand the importance of safety, health and environment.
2. To classify different types of accidents.
3. To study different types of hazards.
4. To study about 5S at workplace.

UNIT-1: Importance of Safety, health and environment: Safety, Health and Environment, cleaning of work area, tools, equipment and materials, Importance of safety, objectives of safety management, personal protective equipment like safety gloves, safety glasses, safety shoes and safety helmet, contents of the first aid kit, instructions of equipment manual.

UNIT-2: **Accidents**: Classification of accidents, causes of accidents, accident investigations/reporting, approaches to prevent accidents, Firefighting.

UNIT -3: **Safety in hazardous area:** Hazards and risks, difference between hazard and risk, Hazard in industrial zones, physical, chemical, environmental, biological, ergonomics and psycho-social hazards, Introduction to OSHMS, OSHAS 18001 and OSHA.

UNIT-4: 5S in safety: The basic principles of 5 S in manufacturing and workplace – Cleaning, sorting etc sorting of materials, tools and equipment's and spare parts, standards, procedures and policies related to 5S, importance of waste disposal, segregation of waste into Hazardous and Non Hazardous waste, disposal the waste as per SOP, labeling procedures, storage procedures.

Unit–5: Inspection: how to measure the correct specifications of the output in the terms of thickness, hardness, durability, tightness, finesse etc. relevant manufacturing standards and

procedures followed in the company in detail, different types of defects which may arise due to improper manufacturing.

Unit–6 Quality control: Concept of quality control. elements of quality control, quality control groups, objectives of quality control. Statistical quality control, objectives of S.Q.C. Inspection by variables & attributes. Frequency distribution, mean, median & mode, standard deviation, X-R charts, P-Charts, C-Charts and acceptance sampling. (i) I.S.O. 9000 (ii) KAIZEN (iii) Six Sigma (iv) 5S.

Course outcomes:

1. Student will aware about safety and health.
2. Student will able to differentiate different types of accidents.
3. Student will able to differentiate different types of risks.
4. Student will learn about 5S at workplace.

Reference books:

1. Industrial Safety and Health Management by C Ray Asfahl, pearson publications.
2. Industrial Safety Management by N. K. Tarafdar
3. Industrial Safety (Safety Management) by D S S Ganguly & C S Changeriya

APPLIED SCIENCE

Semester -2nd
Stream– B.Voc
L T P Total Credits
3 0 0 3

Sessional – 25 Marks
Theory – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives: Following are the objectives of this course:

1) To Learn concepts of Units, Laws of vectors, parallel forces, moment of force, couple.

2) To Learn the fundamentals of properties and behavior of the materials

3) Understand different types of communication systems

4) To know fundamental of advanced communication systems.

Course Contents:

Unit – I Basics of mechanics and force system: Significance and relevance of Mechanics, Statics, Dynamics. Space, time, mass, particle, flexible body and rigid body. Scalar and vector quantity, Units of measurement (SI units) - Fundamental units and derived units. Force – unit, representation as a vector and by Bow's notation, characteristics and effects of a force, Principle of transmissibility of force, Force system and its classification. Resolution of a force - Orthogonal components of a force, moment of a force, Varignon's Theorem. Composition of forces –

Resultant, analytical method for determination of resultant for concurrent, non-concurrent and parallel co-planar force systems – Law of triangle, parallelogram and polygon of forces.

Unit– II Properties of solids: Definitions of deforming force, elasticity and plasticity, examples for elasticity and plasticity, definition of stress and its types with examples and its S.I unit, definition of strain and its types with examples, elastic limit, Hooke's law, stress - strain graph with explanation. Modulus of elasticity and its types, derivation of an expression for Young's modulus of a material. Definition of Compressibility and factor of safety. Simple problems on stress, strain and Young's modulus. Properties of liquids: Definition of thrust and pressure with S.I units. Definition of surface tension and its S.I unit, Viscosity.

Unit– III Transmission of heat: Definitions of conduction, convection and radiation with examples, definition of thermal conductivity, co-efficient of thermal conductivity(K) and its S.I unit. Applications of conduction, convection and radiation.

Unit– IV Thermodynamics: Introduction of thermodynamics, system, surrounding and boundary, types of system, properties of system, state, equilibrium and process, types of thermodynamic processes, laws of thermodynamics- zeroth, First, second and third law.

Unit– V Electromagnetic waves: Definition, generation of electromagnetic waves and their properties. Electromagnetic spectrum: Definition, classification and its applications. Lasers: Principle and listing the types of Laser, properties of Laser, applications. Nano-Technology: Definition of Nano-Technology, advantages and dis-advantages of nano Technology.

Course outcomes: After completing this course, student will be able to:

1. Identify the force systems for given conditions by applying the basics of mechanics.
2. Create knowledge of properties of matter applicable to engineering.
3. Analyse the different concepts of waves and vibration in the field of engineering
4. Analyse the recent trends in physics related to engineering.

Reference Books: -

1. D.S. Bedi, Engineering Mechanics, Khanna Publications, New Delhi (2008)
2. Khurmi, R.S., Applied Mechanics, S. Chand & Co. New Delhi.

3. Bansal R K, A text book of Engineering Mechanics, Laxmi Publications.
4. Ramamrutham, Engineering Mechanics, S. Chand & Co. New Delhi.

EMPLOYABILITY SKILLS

Semester -2nd	Sessional – 25 Marks
Stream– Automobile	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1) To discuss types of communication and their forms.
2) To improve comprehension.
3) To improve spoken English and ability to articulate ideas
4) To improve formal writing skills

Course Contents:

Unit 01 Communication skill: Oral and written communication Listening skills, written communications, motivation, ethics, Time management, facing job interviews, behaviour skills, Assessing oneself.

Unit -02 English Literacy – Pronunciation, listening speaking and reading: - greetings and introductions describing people, Telephone skills, Office Hospitality, Describing things.

Unit -03 Entrepreneurship skills- 1: - Scope and advantage of self-employment, Entrepreneurial skills, values and attitudes, Characters of Successful Entrepreneurs, Identification of entrepreneurs bu self-assessment, Micro, small and medium enterprises, Creativity and idea generation.

Unit -04 Entrepreneurship Skills – 2: - Understanding Consumer, Market Survey: Scope & Influence of publicity and advertisement, Accounting and analysis, Assistance provided by Central and State Govt. Organisations, Project formation, feasibility and profitability estimates, Filling up a Preliminary Project Report Proforma, Investment procedure-loan procurement.

Course Outcome:

1) To learn about communication process and ways to make communication effective by giving attention to all elements involved.

2) To improve grammar and gain confidence by enhancing their abilities to articulate their ideas.
3) To acquire better writing skills in formal communication.
4) To be able to revise documents for fruitful reading and comprehension

Reference books:

1. Wren and Martin. High School English Grammar and Composition. New Delhi: RRP, 2007
2. Murphy, Raymond. Essential English Grammar. New Delhi: Cambridge, 2017
3. Malhotra, Prerna and Halder, Deb. Communication Skills: Theory and Practice.

AUTOMOBILE WORKSHOP – 2

[Including all practicals of Automotive Service Technician Level 5 (ASC/Q 1403)]

Semester 1st	Sessional – 25 Marks
Stream– Manufacturing	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
18 0 0 18	Duration of Exam: 3 Hours

Course Objectives:

1. To introduce about automobile basics.
2. To understand repairing of suspension and steering system.
3. To study the repairing of automobile wheels and tyres.
4. To perform the vehicle over hauling.

(A) Carry out diagnosis of vehicle for repair requirements.

1. To Follow standard operating procedures for using workshop tools and equipment for fault diagnosis or troubleshoot problem in a vehicle.
2. To Conduct inspection of the engine and aggregates to diagnose need for repairs or adjustment in various engine aggregates.
3. To Conduct inspection of mechanical, electrical and electronic systems to diagnose need for repairs, adjustment or part replacement
4. To Understand the various precautions to be taken to avoid damage to the vehicle and its components while working on diagnosis or troubleshooting the vehicle for any faults.

(B) Carry out service and major repairs in mechanical aggregates and overhauling of a vehicle.

1. To Understand the auto component manufacturer specifications related to the various components/ aggregates in the vehicle (including major aggregates like engine. gear box, transmission systems propeller shaft etc.)

2. To Service, repair and overhaul of steering system.
3. To Service, repair and overhaul of suspension system.
4. To Service, repair and overhaul of tyres.
5. To Service, repair and overhaul of wheels.
6. To Service, repair and overhaul diesel Engines and its fuel system.
7. To Service, repair and overhaul petrol Engines and its fuel system.
8. To Service, repair and overhaul of cooling system and radiator
9. To Service, repair and overhaul of emission and exhaust system.
10. To Service, repair and overhaul of gearbox, drive-train assembly and transmission systems (manual, automatic etc.)
11. To Service, repair and overhaul of brake system.
12. To Service, repair and overhaul of pneumatic brakes.
13. To Service, repair and overhaul of hydraulic brakes.
14. To Service, repair and overhaul of clutch assembly.
15. To Service, repair and overhaul of single plate and multi plate clutches.
16. To Service, repair and overhaul of hydraulic and pneumatic system and various lubrication systems.

(C) Carry out service and repairs of electrical and electronic faults in a vehicle.

1. Repair and overhaul of electronic control unit
2. To Repair and overhaul of electrical wire harness, lighting, ignition, electronic and air-conditioning systems etc.
3. To Repair and overhaul of safety systems.
4. Repair and overhaul of hydraulic and pneumatic system.

Course Outcomes:

5. To learn about vehicle and its repair.
6. To improve understanding about different parts and their functions.
7. To perform vehicle wheel balancing.
8. To be able to rectify about vehicle pollution and do its control

THIRD SEMESTER

MOTOR VEHICLE TECHNOLOGY-2

Semester -3rd
Stream– B.Voc (A)
L T P Total Credits
3 0 0 3

Sessional – 25 Marks
Theory – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. To introduce about automobile basics.
2. To understand about suspension and steering system.
3. To study about automobile wheels and tyres.

UNIT 1: INTRODUCTION TO IC ENGINES

Heat engines, development of IC Engine, classification of IC Engine, application of IC Engine, engine cycle-energy balance, basic idea of IC Engine, different parts of IC Engine, terms connected with IC Engine, working cycles, four stroke cycle engine, two stroke cycle engine, intake for compression ignition engine, compression of four stroke and two stroke cycle engines, comparison of SI and CI engine, comparison between petrol and diesel engine**.**

UNIT 2: FUEL SUPPLY SYSTEM (SI ENGINES)

Air, fuel and exhaust gases circuits of petrol and diesel engines, introduction to carburation and carburetors, induction system, factors influencing carburation, mixture requirements, distribution, transient mixture requirements, a simple or elementary carburetor, complete carburetor, carburetors, petrol injection, theory of simple carburetor.

UNIT 3: FUEL SUPPLY SYSTEM (CI ENGINES)

INTRODUCTION to fuel injection system for CI Engines, functional requirements of an injection system, functions of fuel injection system, fuel injection systems, fuel pump and fuel injector (Atomiser), types of nozzles and fuel spray patterns, engine starting systems, fuel injection computation in CI Engines, troubleshooting of a fuel system, troubleshooting of carburetor.

UNIT 4: ENGINE FRICTION AND LUBRICATION SYSTEMS

Introduction, total engine friction, effect of engine parameters on engine friction, determination of engine friction, lubrication systems, crankcase ventilation, lubrication system of some indian vehicle.

UNIT 5: TRANSMISSION SYSTEMS

Introduction to transmission system, clutch, gear box (transmission), propeller shaft, universal joints, final drive and differential, rear axles.

Course Outcomes:

1. To learn various components of automobile.
2. To improve understanding about power unit of automobile.
3. To acquire knowledge about steering and suspension system.
4. To be able to check wheel unbalances.

Reference Books:

1. Automobile Engineering, R.K. Rajput, Laxmi Publications.
2. Automobile Mechanics, A.K. Babu, S.C. Sharma, T.R. Banga, Khanna Publishing House
3. Automobile Engineering by Dr. Kripal Singh

AUTOMOBILE ELECTRICAL & ELECTRONICS

Semester -3rd	Sessional – 25 Marks
Stream– B.Voc (A)	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To introduce about Automotive Electrical and Electronic Systems.
2. To understand about Batteries, Starting System, Charging System.
3. To study about Ignition System, Lighting System
4. To learn about Dash – Board Instruments.

UNIT I: **TYPES OF BATTERIES**

Principle and construction of Lead Acid Battery, Nickel – Cadmium Battery, Nickel Metal, Hybrid Battery, Sodium Sulphur Battery and Aluminium Air Battery, Characteristics of Battery, Battery

Rating, Capacity and Efficiency, Various Tests on Battery, Battery–Charging Techniques, Maintenance of batteries.

UNIT II: **ELECTRICAL COMPONENTS**

Requirements of Starter Motor, Starter Motor types, construction and characteristics, Starter drive mechanisms, Starter Switches and Solenoids, Charging system components, Generators and Alternators, types, construction and Characteristics. Voltage and Current Regulation, Cut –out relays and regulators, Charging circuits for D.C. Generator, A.C. Single Phase and Three – Phase Alternators.

UNIT III **IGNITION SYSTEMS**

Battery Coil and Magneto–Ignition System, Circuit details and Components of Battery Coil and Magneto–Ignition System, Centrifugal and Vacuum Advance Mechanisms, Spark Plugs, Constructional details and Types.

UNIT IV **ELECTRICAL AND ELECTRONIC IGNITION SYSYTEMS**

Electronically–Assisted and Full Electronic Ignition System, Non–Contact–type Ignition Triggering devices, Capacitive Discharge Ignition Distributor–less Ignition System, Digital Ignition System, Control Strategy of Electronic Ignition System.

UNIT V **WIRING, LIGHTING AND OTHER INSTRUMENTS AND SENSORS**

Automotive Wiring, Insulated and Earth Return System, Positive and Negative Earth Systems, Head Lamp and Indicator Lamp Details, Anti–Dazzling and Dipper Details, Electrical and Electronic Fuel Lift Pumps, Theory and Constructional Details of Dash Board Instruments and their Sensors like Speedometer, Odometer, Fuel Level Indicator Oil Pressure and Coolant Temperature Indicators, Horns and Wiper Mechanisms, Automotive Wiring Circuits.

Course Outcomes:

1. Students will able to understand various Automobile Electrical Equipments.
2. Students will able to understand ignition systems.
3. Students will learn about electronic ignition system.
4. Students will understand about autobile wiring, lighting and sensors.
5.

Text books

1) Young, A.P. and Griffith, S.L., Automobile Electrical Equipments, ELBS and New Press.

2) Kholi .P.L.Automotive Electrical Equipment,Tata McGraw-Hill co ltd,New Delhi,2004

3) Automotive Electricals and Electronics, A.K. Babu, Khanna Publishing House

IT TOOLS

Semester -3rd	Sessional – 25 Marks
Stream– B.Voc (A)	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Unit 1: Computer Organization & OS: User perspective.
• Understanding of Hardware.
• Basics of Operating System.

Unit 2: Networking and Internet.
• Network Safety concerns.
• Network Security tools and services.
• Cyber Security.
• Safe practices on Social networking.

Unit 3: Office automation tools:
• Spreadsheet.
• Word processing.
• Presentation.

Unit4: Multi Media Design: (Open Source Design Tools).
- Interface and Drawing Tools in GIMP.
- Applying Filters.
- Creating and handling multiple layers.
- Using Stamping and Smudging tools.
- Importing pictures.

Unit 5: Troubleshooting: Hardware, Software and Networking.
- Commonly encountered problems.
- (Monitor: No display, KB/Mouse not responding, monitor giving beeps, printer not responding, check for virus, Delete temporary files if system is slow, adjust mouse speed).

Work Integrated Learning IT – ISM
- Identification of Work Areas.
- Work Experience.

Reference Books:

1. IT Tools, R.K. Jain, Khanna Publishing House
2. Information Security & Cyber Laws, Sarika Gupta, Khanna Publishing House
3. Mastering PC Hardware & Networking, Ajit Mittal, Khanna Publishing House

SOFT SKILLS

Semester -3rd
Stream– B.Voc (AM)
L T P Total Credits
4 0 0 4

Sessional – 25 Marks
Theory – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1) To help the students in building interpersonal skills.

2) To develop skill to communicate clearly.

3) To enhance team building and time management skills.

4) To learn active listening and responding skills.

UNIT 1: GRAMMAR AND VOCABULARY

1.Tenses, 2. Subject–verb agreement. 3. Sentence Analysis: Simple, Compound and Complex sentences. 4. Phrases: Adjective, Adverb and Noun Phrase, 5. Clauses: Adjective, Adverb and Noun Phrase. 6. Voice, Narration, Gerund, Participle.

UNIT 2: ORAL COMMUNICATION

1. Listening Skill – Active listening, Barriers to active listening. 2. Speaking Skill-Stress patterns in English, 3. Questioning skills, 4. Barriers in Speaking 5. Reading Skill-Skimming, Scanning, Intensive reading, 6. linking devices in a text, 7. Different versions of a story/ incident.

UNIT 3: WRITING SKILLS

Letter writing, Business letters • Application letters • Covering letters • Report writing o Academic report o Business report o Technical report o Technical project report • Job Application and Resume writing

UNIT- IV: SOFT SKILLS

1.Body Language– Gesture, posture, facial expression. 2. Group Discussion– Giving up of PREP, REP Technique. 3. Presentation Skills: a. (i) How to make power point presentation b. (ii) Body language during presentation 4. Resume writing: Cover letter, career objective, Resume writing (tailor made) 5. Interview Skills: Stress Management, Answering skills.

UNIT- 5: STRESS AND TIME MANAGEMENT

Introduction • Stress In Today's Time • Identifying The Stress Source • Signs Of Stress • Ways To Cope With Stress • Healthier Ways To Deal With Stress • Time Management • Prioritize Your Work • Smart Work • Four Ds Of Decision Taking.

REFERENCE BOOKS:

1. Advanced English Usage: Quirk & Greenbaum; Pearson Education.

2. Developing Communication Skills: Banerjee Meera & Mohan Krishna; Macmillan Publications, 1990.

3. Personality Development and Group Discussions by Barun K. Mitra, Oxford University Press

WORKSHOP-3

Semester -3rd
Stream– B.Voc (A/M)
L T P Total Credits
0 0 8 10

Internal – 50 Marks
External – 50 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

1: INTRODUCTION TO AUTOCAD

Starting AutoCAD, AutoCAD Screen Components (Drawing Area Command Window Navigation bar Status bar), Invoking Commands inAutoCAD Keyboard(Ribbon Application Menu Tool Palettes Menu Bar Toolbar), Shortcut Menu, AutoCAD Dialog Boxes, Starting a New Drawing (Open a Drawing Start from Scratch Use a Template Use a Wizard, Saving Your Work, Save Drawing as Dialog box), Using the Drawing Recovery Manager to Recover Files, Closing a Drawing, Opening an Existing Drawing, Opening an Existing Drawing Using the Select File Dialog Box Opening an Existing Drawing Using the Startup Dialog Box Opening an Existing Drawing, Using the Drag and Drop Method, Quitting AutoCAD, Creating and Managing Workspaces Creating a New Workspace Modifying the Workspace Settings Autodesk Exchange

2: GETTING STARTED WITH AUTOCAD

Dynamic input mode, Enable Pointer Input, Enable Dimension Input where possible Show command prompting and command input near the crosshairs, Drafting Tooltip Appearance, Drawing Lines in autocad, The Close Option, The UndoOption, Invoking tools Using Dynamic INPUT/Command Prompt Coordinate Systems, Absolute Coordinate System, Relative Coordinate System, Relative Polar Coordinates, Direct Distance Entry Erasing Objects, Cancelling and Undoing a Command Object Selection Methods, Window Selection Window Crossing Method Drawing a Circle, BASIC Display Commands Setting Units Type and Precision, Specifying the Format Specifying the Angle Format, setting the limits of a drawing.

3: STARTING WITH ADVANCED SKETCHING

Drawing Arcs, Drawing Rectangles, Drawing Ellipses, Drawing Regular Polygon, Drawing Polylines Placing Points, Drawing Infinite Lines Writing a Single Line Text

4: WORKING WITH DRAWING AIDS

Introduction, Understanding the Concept and use of LAYERS, Advantages of Using Layers, Working with Layers, Creating New Layers, Making a Layer Current, Controlling the Display of Layers, Deleting Layers, Object Properties Changing the Colour, Changing the Line type, Changing the Line weight, Changing the Plot Style, Properties Palette, Quick Properties, Palette Drafting, Settings dialog box, Setting Grid, Setting Snap, Snap Type, Drawing Straight Lines using the Ortho Mode, Working with Object Snaps, Auto Snap, Endpoint Midpoint, Nearest Centre, Tangent Quadrant Intersection, Apparent Intersection Perpendicular, Node Insertion, Snap to None Parallel Extension From, Midpoint between 2 Points, Temporary Tracking Point, Combining Object Snap Modes, Running Object, Snap Mode, Overriding the Running Snap, Cycling through Snaps, Using Auto Tracking, Object Snap Tracking, Polar Tracking, Auto Track Settings, Function and Control Keys.

5: EDITING SKETCHED OBJECTS-I

Editing Sketches, Moving the Sketched Objects, Copying the Sketched Objects, Creating Multiple Copies, Creating a Single Copy, Offsetting Sketched Objects, Rotating Sketched Objects, Scaling the Sketched Objects, Filleting the Sketches, Chamfering the Sketches,

Trimming the Sketched Objects, Extending the Sketched Objects, Stretching the Sketched Objects, Lengthening the Sketched Objects, Arraying the Sketched Objects, Rectangular Array Polar Array, Path Array, Mirroring the Sketched objects Text Mirroring.

6: EDITING SKETCHED OBJECTS-II

Introduction to Grips Types of Grips, Editing a Polyline by Using Grips Editing Gripped Objects ,Changing the Properties Using the PROPERTIES Pale Matching the Properties of Sketched Objects, Cycling Through Selection, Managing Contents Using the Design enter Autodesk Seek design content Link Displaying Drawing Properties, Basic Display Options Redrawing the Screen Regenerating Drawings, Zooming Drawings Real-time Zooming All Option, Centre Option Extents Option Dynamic Option Previous Option Window Option Scale Option Object Option Zoom In and Out, Panning Drawings Panning in Real time.

7: CREATING TEXT AND TABLES

Annotative Objects Annotation Scale, Assigning Annotative Property and Annotation Scales Customizing Annotation Scale, Multiple Annotation Scales, Assigning Multiple Annotation Scales Manually Assigning Multiple Annotation Scales Automatically, Controlling the Display of Annotative objects Creating Text, Writing Single Line Text Entering Special Characters Creating Multiline Text, Text Window Text Editor Tab, Editing Text, Editing Text Using the DDEDITCommand Editing Text Using the Properties Palette Modifying the Scale of the Text, Inserting Table in the Drawing Table style Area, Insert options Area Insertion behaviour Area, Column and row settings Area Set cell styles Area, Creating a New Table Style Starting table Area General Area, Cell styles Area, Setting a Table Style as Current Modifying a Table Style Modifying Tables, Substituting Fonts, Specifying an Alternate Default Font Creating Text Styles, Determining Text Height Creating Annotative text

8: BASIC DIMENSIONING, GEOMETRIC DIMENSIONING, AND TOLERANCING

Need for Dimensioning in AutoCAD Fundamental Dimensioning Terms, Dimension Line, Dimension Text Arrowheads Extension Lines Leader, Centre Mark and Centrelines Alternate Units, Tolerances Limits, Associative Dimensions Definition Points Annotative Dimensions, Selecting Dimensioning Commands Using the Ribbon and the Toolbar Using the Command

Line, Dimensioning a Number of Objects Together Creating Linear Dimensions, DIMLINEAR Command Options Creating Aligned Dimensions Creating Arc Length Dimensions Creating Rotated Dimensions Creating Baseline Dimensions Creating Continued Dimensions Creating Angular Dimensions, Dimensioning the Angle between Two Nonparallel Lines Dimensioning the Angle of an Arc, Angular Dimensioning of Circles, Angular Dimensioning based on Three Points Creating Diameter Dimensions, Creating Radius Dimensions Creating Jogged Linear Dimensions Creating Ordinate Dimensions, Maintaining Equal Spacing between Dimensions Creating Inspection Dimensions, Inspection Label Dimension Value, Working with True Associative Dimensions Inspection Rate, Removing the Dimension Associatively, Converting a Dimension into a True Associative Dimension Drawing Leaders, Multileader, Adding leaders to existing Multileader, Removing Leaders from Existing Multileader, Aligning Multileaders, Distribute, Make leader segments Parallel Specify Spacing, Use current spacing, Geometric Dimensioning and Tolerance Geometric Characteristics and Symbols Adding, Geometric Tolerance, Feature Control Frame, Geometric Characteristics Symbol, Tolerance Value and Tolerance Zone Descriptor Material Condition Modifier, Datum, Complex Feature Control Frames Composite Position Tolerance Projected Tolerance Zone, Creating Annotative Dimensions, Tolerances, Leaders, and Multileaders

9: EDITING DIMENSIONS

Editing Dimensions Using Editing Tools Editing Dimensions by Stretching, Editing Dimensions by Trimming and Extending Flipping Dimension Arrow, Modifying the Dimensions Editing the Dimension Text Updating Dimensions, Editing Dimensions with Grips, Editing Dimensions using the Properties Palette Properties Palette (Dimension), Properties Palette (Multileader), Model Space and Paper Space Dimensioning

10: DIMENSION STYLES, MULTILEADER STYLES, AND SYSTEM VARIABLES

Using Styles and Variables to Control Dimensions Creating and Restoring Dimension Styles, New Dimension Style dialog box Controlling the Dimension Text Format Fitting Dimension Text and Arrowheads Formatting Primary Dimension Units Formatting, Alternate Dimension

Units Formatting the Tolerances, Creating and Restoring Multileader Styles Modify Multileader Style dialog box.

11: MODEL SPACE VIEWPORTS, PAPER SPACE VIEWPORTS, AND LAYOUTS

Model Space and Paper Space/Layouts Model Space Viewports (Tiled Viewports), Creating Tiled Viewports Making a Viewport Current Joining Two Adjacent Viewports, Paper space viewports (Floating Viewports) Creating Floating Viewports, Creating Rectangular Viewports Creating Polygonal Viewports, Converting an Existing Closed Object into a Viewport Temporary Model Space, Editing Viewports, Controlling the Display of Objects in Viewports Locking the Display of Objects in Viewports Controlling the Display of Hidden Lines in Viewports Clipping Existing Viewports, Maximizing Viewports Inserting Layouts, Inserting a Layout Using the Wizard Defining Page Settings, Controlling the Display of Annotative Objects in Viewports

12: PLOTTING DRAWINGS

Plotting Drawings in AutoCAD, Plotting Drawings Using the Plot Dialog Box Page setup Area, Printer/plotter Area Paper size Area Number of copies Area Plot area, Plot offset (origin set to printable area) Area Plot scale Area, Plot style table (pen assignments) Area Shaded viewport options Area, Plot options Area Preview, Adding Plotters, The Plotter Manager Tool Using Plot Styles, Adding a Plot Style

13: HATCHING DRAWINGS

Hatching, Hatch Patterns Hatch Boundary, Hatching Drawings Using the Hatch Tool Panels in the Hatch Creation Tab, Boundaries Panel Pattern Panel Properties Panel Origin Panel Options Panel Match Properties, Setting the Parameters for Gradient Pattern Creating Annotative Hatch, Hatching the Drawing Using the Tool Palettes Drag and Drop Method, Select and Place Method, Hatching Around Text, Dimensions, and Attributes

14: WORKING WITH BLOCKS

The Concept of Blocks Advantages of Using Blocks Drawing Objects for Blocks, Converting Entities into a Block Inserting Blocks, Creating and Inserting Annotative Blocks Block Editor, Adding Blocks in Tool Palettes Drag and Drop Method, Modifying Existing Blocks in the

Tool Palettes, Layers, Colours, Line types, and Line weights for Blocks Nesting of Blocks, Creating Drawing Files using the Write Block Dialog Box Exploding Blocks Using the XPLODE Command Renaming Blocks, Deleting Unused Blocks Editing Constraints to Block.

FOURTH SEMESTER

Students will go in industries for On Job Training. Students will be evaluated based upon On Job Training (OJT)/Internship including report and presentation.

FIFTH SEMESTER

Students will go in industries for On Job Training. Students will be evaluated based upon On Job Training (OJT)/Internship including report and presentation.

SIXTH SEMESTER

VEHICLE PERFORMANCE AND TESTING

Semester - VI	Sessional – 25 Marks
Stream– Automobile	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To introduce about various parameters of vehicle performance.
2. To understand drive train and Component testing.
3. To study Vehicle testing.

Course Contents:

Unit-I: Vehicle Performance Parameters: Vehicle Performance parameters: Fuel economy, acceleration, deceleration, gradability, top speed, handling, comfort, life durability, EGR systems, Impact of vehicular systems on performance: Suspension system, Steering system, Brakes, Tyres, carriage unit. Catalytic converters function and construction, Lambda close loop control system for gasoline vehicles.

Unit-II: Drive train and Component testing: Vehicular transmission performance: comparison of automotive clutches, Epicyclic transmission, torque converter, final drive and differential, testing of vehicle components: clutch, gear box (for noise and shifting force), brake testing, wheels and tyre testing – tyre wear pattern identification and causes.

Unit-III: Vehicle testing: Vehicle Testing - Road test, free acceleration test, coast down test, passer by noise test, road load data acquisition for vehicle. Test tracks: Proving ground testing, high speed track, pavement track, corrugated track, mud track, steering pad, gradient track, deep wading through shallow water Laboratory testing: Testing on chassis dynamometer, transition testing (Euro III onwards), accelerated testing, virtual testing, evaporative emission testing, oil consumption testing, endurance test, high speed performance test. Collisions and Crash Testing: Crash testing: Human testing, dummies, crashworthiness, pole crash testing, rear crash testing, vehicle to vehicle impact, side impact testing, crash test sensors, sensor mounting, crash test data acquisition, braking distance test.

Unit-IV: Comfort, Convenience and Safety: Seats: types of seats, driving controls accessibility, and driver seat anthropometry. Steering: steering column angle, collapsible steering, and power steering. Adaptive cruise control, navigation system, adaptive noise control, driver information system, Safety: Motor vehicle safety standards, active safety, passive safety, bio-mechanics Structural safety, energy absorption, ergonomic consideration in safety.

Unit-V: Noise Vibration and EMI: Noise and vibration: Mechanism of noise generation, engine noise and vibration, causes and remedies on road shocks, wind noise and measurement. Automobile testing instrumentation: Sensors types and selection, instrumentation for functional tests, model test and full scale testing.

INDUSTRIAL MANAGEMENT

Semester - VI	Sessional – 25 Marks
Stream– Automobile	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

1. Introduction: Growth of industry, The management of men, materials and machines, the art of management, Sources of capital- industrial individual enterprise, private partnership and private Ltd. Co., Joint Stock Co. shares, debentures, financial agencies and their role in promoting industries. Break even analysis.

2. Private sector and public sector: Public sector enterprise, merits and demerits of public sector industry and private sector industry, Line, staff and functional organizations, reasons for the choice of various types of organization, functions of different departments, viz. stores, purchase and sales departments relationship between individual departments.

3. Wages & incentives: Definition of wages, real wage and nominal wage, systems of wage payment, incentives, financial and non - financial incentives, Essentials of a good wage plan, essentials of a good incentive scheme. Introduction to elements of cost & indirect expenses, Material cost, labour cost, fixed and variable overheads, components of cost, selling price, Factory expenses, administrative expenses, selling & distribution expenses, depreciation, obsolescence, interest on capital, Idleness, Repair and maintenance.

4. Labour, industrial & tax laws: Evolution of industrial law, factory act, workmen compensation act, payment of wages act, employee's state insurance act, Industrial dispute act. Role of technician in industry: Position of technician in various engineering departments, Role of a supervisor in industry, Foremanship, duties and qualities of a good foreman.

5. Material management: Introduction, Scope of Material Management selective control techniques-ABC analysis, Material handling, inventory control, Essential steps in inventory control, quality standards

Reference Books: 1. Industrial Management, S.C. Sharma, Khanna Publishing House

ENTREPRENEURSHIP

Semester - VI	Sessional – 25 Marks
Stream– Automobile	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Unit-1: Entrepreneurship and entrepreneur: Entrepreneurship concept and process, Entrepreneur, Essential Characteristics of a good Entrepreneur, Types of entrepreneur, Industrial Policy, Classification of industries- Micro, small scale , Medium scale, Large scale, Product identification/ selection, Site selection, Plant layout, Pre-market survey.

Unit-2: Entrepreneurship Support System and Start-ups: Introduction to start-up's, Role of District Industries Centre in setting up industry, Function of NSIC, SISI, NISIET, NRDC, SSIC, SIDO, NMTC, KVIC, RSMML, Role of state finance corporation, state electricity corporations, pollution control board, BIS, I.S.O. etc.

Unit-3 Introduction to Tax System, and Acts: Idea of income tax, Goods and Services Tax and custom duty, Introduction to Industrial Acts, factory Act, Workmen's Compensation Act 1923, Apprentices Act 1961, Environmental Protection Act 1986

Unit-4: Project Report Preparation: Procedure of preparing a project report, Format of project report, Preparation of project report, Introduction to ISO: 9000 Series of Quality System

Outcome:

- Students will be aware about the concepts of entrepreneurship development and significance of entrepreneurship in economic development.
- It will help students to know about various acts related to an industry.
- Students will be able to prepare project report.
- They will be able to know the support available from Govt. to start a new venture.

Reference Books:

1. Khanka S.S., "Entrepreneurship Development" S.Chand.
2. Desai, A N. "Entrepreneur & Environment" Ashish, New Delhi.
3. Drucker, Peter. "Innovation and Entrepreneurship" Heinemann, London.

4. Kumar, S A. "Entrepreneurship in Small Industry" Discovery, New Delhi

ALTERNATIVE FUELS & EMISSION CONTROL*

Semester - VI	Sessional – 25 Marks
Stream– automobile	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To introduce about alternate fuels.
2. To understand about automobile emission control system.
3. To study about emission measurement and control.

Course Contents:

Unit-I: Conventional Fuels and Need for alternative fuels: Estimate of petroleum reserve and availability - comparative properties of fuels- diesel and gasoline, quality rating of SI and CI engine fuels, fuel additives for SI and CI engines, need for alternative fuels, applications, types etc.

Unit-II: Alternative Fuels: Gaseous Fuels and Bio-fuel: Introduction to CNG, LPG, ethanol, vegetable oils, bio-diesel, biogas, Hydrogen and HCNG. Study of availability, manufacture, properties, storage, handling and dispensing, safety aspects, engine/vehicle modifications required and effects of design parameters performance and durability Synthetic Fuels Introduction to Syngas, DME, P-Series, GTL, BTL, study of production, advantages, disadvantages, need, types, properties, storage and handling, dispensing and safety, discussion on air and water vehicles.

Unit–III: Emission Control (SI Engine): Emission formation in S.I. engines - Hydrocarbons, carbon monoxide, oxides of nitrogen, poly-nuclear aromatic hydrocarbon, effects of design and operating variables on emission formation in spark ignition engines, controlling of pollutant formation in engines exhaust after treatment, charcoal canister control for evaporative emission control, emissions and drivability, positive crank case ventilation system for ubhc emission reduction.

Unit-IV: Emission Measurement and Control (CI Engine): Chemical delay, intermediate compound formation, pollutant formation on incomplete combustion, effect of design and operating variables on pollutant formation, controlling of emissions, emissions and drivability, exhaust gas recirculation, exhaust after treatment – doc, dpf, scr and lnt. Measurement and test procedure (ndir analyzers, fid, chemiluminescence nox analyzer, oxygen analyzer, smoke measurement, constant volume sampling, particulate emission measurement, orsat apparatus.)

Unit-V: Health effects of Emissions from Automobiles: Emission effects on health and environment. Emission inventory, ambient air quality monitoring, Emission Norms: As per Bharat Standard up to BS – IV.

Reference Books: 1. Electric & Hybrid Vehicles, A.K. Babu, Khanna Publishing House

VEHICLE BODY ENGINEERING*

Semester - VI	Sessional – 25 Marks
Stream– Automobile	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To familiarize the students with the fundamentals of vehicle body.
2. After completion of the course, the student shall be able to explain the concept of car body design, passenger safety, crumple zone and crash testing. Identify the concepts of wind tunnel testing and vehicle body optimization techniques to reduce drag.
3. To Demonstrate the various types of bus body construction, seating layout, regulations and comfort.

UNIT-I

Auto Body- Introduction, main features and functions of body, body requirements, Types: saloon, convertibles, limousine, estate car, racing and sports car. Visibility: regulations, driver's visibility, tests for visibility, frame construction- tubular, interlaced, channel section, ladder type, car frame, truck frame.

UNIT-II

Body Structures- frameless construction, integral construction, semi- unitary or endo- skeleton, unitary with sub frame, car body paneling, special purpose bodies, passenger and luggage requirements, all metal bodies, coach built bodies, auto floors, cowl assembly, front end assembly, roof assembly doors and door fittings.

UNIT-III

Body Materials- requirement of body material, type- specification, Timber- plywood fibre board, Steel, Mild steel – angle, channel, strips, Aluminium alloy- sheets, strips, channel etc., Rivets/ screws, glass- coloured glass, toughened glass, fibre reinforced

UNIT- IV

Safety Standards-Safety standards regarding- anchorage, instruments/ control, windshield, glass, wipers, doors,
windows, roofs, head rests, safety belts, air bags.

Text Book(s):

[T1] Sydney F. Page, "Body Engineering", 3rd Ed. Chapman & Hill Ltd., London.
[T2] P.L. Kohli, "Automotive Chassis and Body", McGraw Hill Publication Co.
[T3] J Fairbrother, "Fundamentals of Vehicle Body work", Hutchinson, London

AUTOTRONICS*

Semester - VI	Sessional – 25 Marks
Stream– Automobile	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To understand importance of electronics in an automobile.
2. To study Automotive Sensors & Actuators.
3. To study Automotive Electronic Systems.

UNIT –I

Fundamentals of Automotive Electronic System: Current Trends in Automotive Electronic Engine Management System, Electro-magnetic Interference Suppression, Electromagnetic Compatibility, Electronic Dashboard Instruments, onboard Diagnostic system, security and warning systems.

UNIT –II

Automotive Sensors & Actuators Types of sensors, actuators, Crankshaft position, camshaft position, manifold absolute pressure, Airflow rate sensor, Throttle position sensor, Inlet air temperature sensor, oxygen sensor, vehicle speed sensor, Wheel speed sensor, sensors for feedback control, engine control actuators, Solenoid actuators, motorized actuators.

UNIT –III

Automotive Electronic Systems Electronic Ignition systems, Electronic injection systems, Antilock brake system circuit, Traction control, Electronic control of automobile transmission, Active suspension, EPS

UNIT –IV

Applications Data Acquisitions- Temperature Control – Stepper Motor Control-Automotive Applications Engine Control, Suspension System Control, Driver Information Systems), Development of A High Speed, High Precision Learning Control System for the Engine Control. Programmable Logic Controls, Relay Logic, Control, Motion Control.

[T1, T2][No. of Hrs. 11]

Text Book(s):

[T1] Ramesh Goankar S., "Microprocessor Architecture Programming and Applications", Willey Eastern Ltd.

[T2] William B. Riddens, "Understanding Automotive Electronics", 5thEdition, Butter Worth Heinemann

PROJECT

Students needs to do a project in this semester.

AUTOMOBILE WORKSHOP-6

[Including all practicals of Service Supervisor Level 7 (ASC/Q 1412)]

Semester - VI	Sessional – 25 Marks
Stream– Manufacturing	Theory – 25 Marks
L T P Total Credits	Total: 50 Marks
0 0 15 15	Duration of Exam: 3 Hours

Course Objectives:

1. To introduce about automobile basics.
2. To understand repairing of suspension and steering system.
3. To study the repairing of automobile wheels and tyres.
4. To perform the vehicle over hauling.

1) To Follow standard operating procedures for using workshop tools and equipment for fault diagnosis or troubleshoot problem in a vehicle.
2) To Conduct inspection of the engine and aggregates to diagnose need for repairs or adjustment in various engine aggregates.
3) To Conduct inspection of mechanical, electrical and electronic systems to diagnose need for repairs, adjustment or part replacement
4) To Understand the various precautions to be taken to avoid damage to the vehicle and its components while working on diagnosis or troubleshooting the vehicle for any faults.
5) To Understand the auto component manufacturer specifications related to the various components/ aggregates in the vehicle (including major aggregates like engine. gear box, transmission systems propeller shaft etc.)
6) To Service, repair and overhaul of steering system.
7) To Service, repair and overhaul of suspension system.
8) To Service, repair and overhaul of tyres.
9) To Service, repair and overhaul of wheels.
10) To Service, repair and overhaul diesel Engines and its fuel system.
11) To Service, repair and overhaul petrol Engines and its fuel system.
12) To Service, repair and overhaul of cooling system and radiator

13) To Service, repair and overhaul of emission and exhaust system.
14) To Service, repair and overhaul of gearbox, drive-train assembly and transmission systems (manual, automatic etc.)
15) To Service, repair and overhaul of brake system.
16) To Service, repair and overhaul of pneumatic brakes.
17) To Service, repair and overhaul of hydraulic brakes.
18) To Service, repair and overhaul of clutch assembly.
19) To Service, repair and overhaul of single plate and multi plate clutches.
20) To Service, repair and overhaul of hydraulic and pneumatic system and various lubrication systems.
21) Repair and overhaul of electronic control unit
22) To Repair and overhaul of electrical wire harness, lighting, ignition, electronic and air-conditioning systems etc.
23) To Repair and overhaul of safety systems.
24) Repair and overhaul of hydraulic and pneumatic system.

Course Outcomes:

1) To learn about vehicle and its repair.
2) To improve understanding about different parts and their functions.
3) To perform vehicle wheel balancing.
4) To be able to rectify about vehicle pollution and do its control

J.C. Bose University of Science & Technology, YMCA, Faridabad

(A Haryana State Government University)

(Established by Haryana State Legislative Act No. 21 of 2009 & Recognized by UGC Act 1956 u/s 22 to Confer Degrees)

Accredited 'A' Grade by NAAC

Annexure-1A

COMMUNITY COLLEGE OF SKILL DEVELOPMENT (CCSD

Program B.Voc Automobile (program Code: 253)

Revised Scheme Course Index of the year 2020-2021(BOS Dated 18/05/2020)

Mapping of the course with the employability/Entrepreneurship/Skill Development

S.No	Course	Code	Skill Development	Entrepreneurship	Employability
1	COMMUNICATION SKILLS	BSC-101	✓	✓	
2	ENGINEERING CALCULATIONS	BSC-102	✓	✓	
3	ENGINEERING SCIENCE	PCC-AM-106	✓		✓
4	Motor Vehicle Techonolgy-1	PCC-A-101	✓		✓
5	Automobile Workshop-1	PCC-AM-103	✓	✓	✓
6	EMPLOYABILITY SKILLS - 1	BSC-206	✓	✓	
7	APPLIED SCIENCE	PCC-AM-205	✓		✓
8	QUALITY, INSPECTION AND SAFETY	PCC-AM-202	✓		✓
9	Elements of Automobile Engg	PCC-AM-203	✓		✓
10	Automobile Workshop-2	PCC-AM-204	✓	✓	✓
11	Motor Vehicle Technology-2	PCC-AM-303	✓		✓
12	Automobile Electrical Equipment	PCC-AM-304	✓		✓
13	IT TOOLS	PCC-AM-306	✓		✓
14	SOFT SKILLS	BSC-301	✓	✓	
15	Automobile Workshop-3	PCC-AM-305	✓	✓	✓
16	ON-JOB TRAINING (OJT)	PCC- AM-401	✓	✓	✓
17	ON-JOB TRAINING (OJT)	PCC-AM-501	✓	✓	✓
18	Vehicle Performance and Testing	PCC-A-605	✓		✓
19	INDUSTRIAL MANAGEMENT	PCC-AM-603	✓		✓
20	ENTREPRENEURSHIP	BSC-601	✓	✓	
21	PROJECT	BSC-602	✓	✓	✓
22	Automobile Workshop-4	PCC-AM-606	✓	✓	✓
23	Alternative Fuels & Emission Control*	PCC-A-604	✓		✓
24	Vehicle Body Engineering*	PCC-A-608	✓		✓
25	Autotronics*	PCC-A-607	✓		✓

Principal, CCSD

SCHEME OF EXAMINATION

and

SYLLABUS

for

Bachelors in Vocation (B.Voc)

in

MANUFACTURING

Offered by

Community college of skill development

J C Bose University of Science & Technology YMCA

Sector-6, Mathura Road, Faridabad, Haryana, India

ABOUT THE PROGRAM

The B.Voc. Degree in manufacturing runs with a mission to impart knowledge, technical skills & hands-on training in production, focusing on manufacturing, quality control, CNC technology and machine maintenance. This program is an outcome of industry and student demand. Only Degree program in manufacturing with more than 80% Practical to make you more employable and outshine your career. This program is designed to introduce the students to the elements of engineering and management sciences and production technology consists of elements of operations research, production planning, materials management etc. Students under this program will use application of engineering and management techniques to simplify production process. The main aim of production technology is to solve problems and challenges arising in the field of production/manufacturing. Vocational training programs have been created with the aim of imparting industry-specific skills in students. These programs are crafted in such a way that the students acquire skills, which will lead them to employment in the respective sector.

PROGRAMME EDUCATIONALOBJECTIVES (PEOs)

PEO-1: To train students with practical skills and experimental practices related to core and applied areas of Manufacturing Technology to expand their knowledge horizon beyond books and make them industry ready.

PEO-2: To enable students to design and manufacture mechanical equipments which are useful for the industries.

PEO-3: To improve team building, team working and leadership skills of the students with high regard for ethical values and social responsibilities.

PEO- 4: To enable students to communicate effectively and efficiently.

PROGRAMME OUTCOMES (POs)

After completion of the program, the student will:

1) Be trained to NSQF level 7 in at least one job/profile in the field of automotive manufacturing skills
2) Be trained for multiple skill sets under the domain of manufacturing.
3) Be able to supervise the various workshop floors for mechanical shop, weldin and quality control.
4) Be trained & equipped with knowledge and understanding to start his/her own enterprise in manufacturing.
5) Be able to develop skills in management of customer issues, analysis and evaluation mechanical, electrical and electronics faults.
6) Be able to supervise the various manufacturing workshop floors for mechanical shop.

PROGRAMME SPECIFICOUTCOMES (PSOs):

1) To apply practical skills, vocational training and knowledge of Manufacturing fundamentals to industries.
2) The student will be ready and skilled to take-up career or to pursue higher studies with high regard to ethical values and social responsibilities.

SYLLABUS & SCHEME OF EXAMINATION

Year	FIRST SEMESTER			SECOND SEMESTER		
	Course	**Code**	**Credit**	**Course**	**Code**	**Credit**
I	Communication Skills	BSC-101	3	Employability Skills - 1	BSC-206	3
	Engineering Calculations	BSC-102	3	Applied Science	PCC-AM-205	3
	Engineering Science	PCC-AM-106	3	Quality, inspection and Safety	PCC-AM-202	3
	Manufacturing process-1	PCC-AM-101	3	Manufacturing process-2	PCC-AM-201	3
	Manufacturing Workshop-1	PCC-AM-103	18	Manufacturing Workshop-2	PCC-AM-204	18
	Cumulative Credits = 30 Certificate			**Cumulative Credits = 60 Diploma**		
	NSQF LEVEL - 5 JOB ROLE – MACHINE SHOP SUPERVISOR (ASC/Q3505)					
Year	**THIRD SEMESTER**			**FOURTH SEMESTER**		
II	Machining and Machine Tools		3	On Job Training (OJT)/ Internship evaluation including report and presentation	PCC-AM-401	30
	Material Science	PCC-AM-302	3			
	IT TOOLS	PCC-AM-306	3			
	Soft Skills	BSC-301	3			
	Manufacturing Workshop-3	PCC-AM-305	18			
	Total		30	Total		30
	Cumulative Credits = 120 ADVANCED DIPLOMA					
	NSQF LEVEL - 6 JOB ROLE – Machine Setter / Master Technician (ASC/Q3506)					
Year	**FIFTH SEMESTER**			**SIXTH SEMESTER**		
III	On Job Training (OJT)/ Internship	PCC-AM-501	30	Quality Control Techniques	PCC-M-604	3
				Industrial Management	PCC-AM-603	3
				Entrepreneurship	BSC-601	3
				Project	BSC-602	3
				Manufacturing Workshop-4	PCC-M-606	15
				ELECTIVES (Choose any one)		
				Reliability, Maintenance & Safety Engineering*	PCC-M-605	3
				Plant Layout & Product Handling*	PCC-M-607	
				CAD & CAM*	PCC-M-608	
	Total		30	Total		30
	Cumulative Credits = 180 B.VOC					
	NSQF LEVEL - 7 JOB ROLE - Supervisor Manufacturing (ASC/Q6306)					

FIRST SEMESTER

MANUFACTURING PROCESS-1

Semester 1st
Stream– Manufacturing
L T P Total Credits
3 0 0 3

Sessional – 25 Marks
Theory – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course objectives:

1. To study the various manufacturing processes.
2. To understand the working of various cutting tools.
3. To understand measurement and measuring instruments.
4. To introduce about NC and CNC machines.

Unit-1 Pre-machining activities:

does and don'ts of the manufacturing process, Metal properties/ metallurgy, coolant and lubricants, Selection of proper coolant and lubricant required for machining the required component, use of machine guards, acceptance requirements/ limits of machining e.g. surface finish, specific orientation, gauge inspection etc., introduction to jigs and fixtures, different holding fixtures, gears, stops, Introduction to Measuring devices: micrometers, vernier calipers, gauges, rulers.

Unit-2 Metal Cutting

Introduction to metal cutting, orthogonal and oblique cutting, types of chips, cutting tools, introduction to different types of tools used in the machining process, single point and multi point cutting tools, single point tool geometry, ASA tool signature, material removal rate.

Unit- 3 Machining

Different types of machining processes, basic fundamentals of machines and mechanics, introduction and operations of lathe, turning, milling, shaping, boring, broaching, hobbing, facing and shaping, blanking and piercing processes, special purpose machine for operations.

grinding, grinding procedure, balancing and dressing of wheels, abrasive, Post machining activities: Impact of presence of burrs, edges, chips on the final product performance, de burring, use of chisels, scrapers to Trim, scrape or de burr objects or parts.

Unit- 4 Introductions to NC and CNC machines

NC machines, components of NC and CNC machines, difference between NC and CNC, G- codes and M codes, right command in the CNC machine, Introduction to quality, 7 quality tools, company policy.

Course outcomes:

1. Students will able to differentiate between various manufacturing processes.

2. Students will able to use different measuring instruments.
3. Students will learn about different machining operation.
4. Students will understand about NC and CNC machines.

Reference books:

1. Manufacturing technology by P. N. Rao
2. Production technology- R. K. Jain
3. Manufacturing Science- Amitabha Ghosh & Ashok Kumar Malik, - East- West Press.
4. Workshop Technology Vol I & II –Hazra & Chaudhary, Asian Book Comp., New Delhi.

ENGINEERING SCIENCE

Semester 1st	Sessional – 25 Marks
Stream– Manufacturing	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course objectives:

1. To study the various unit systems.
2. To understand the concepts of forces and motions.
3. To understand thermodynamics.
4. To introduce about pollutions.

UNIT I: Units and Measurements

Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures. Dimensions of physical quantities, dimensional analysis and its applications.

UNIT II: Laws of Motion

Intuitive concept of force, Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion.

Law of conservation of linear momentum and its applications.

Equilibrium of concurrent forces, Static and kinetic friction, laws of friction, rolling friction, lubrication.

Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on a level circular road, vehicle on a banked road).

UNIT III: Thermodynamics

Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; Cp, Cv - calorimetry; change of state - latent heat capacity. Thermal equilibrium and definition of temperature (zeroth law of thermodynamics), heat, work and internal energy. First law of thermodynamics, isothermal and adiabatic processes.

Second law of thermodynamics: reversible and irreversible processes, Heat engine and refrigerator.

UNIT IV: Fuel and their Classification

Definition, characteristics, classification into solid, liquid and gaseous fuel, Petroleum and brief idea of refining into various factions and their characteristics and uses, Calorific value of fuel, Gaseous fuels- preparation, properties, composition and use of producer gas, water and oil gas.

UNIT V: Pollution & its Control

Air Pollution: Types of pollutants, source effects, sink and control of primary pollutants – CO, No_x, HC, So_x and particulates, effects of pollutants on man and environment – photochemical smog and acid rain. Water Pollution: Classification of pollutants, their sources, waste water treatment – domestic and industrial. Soil Pollution: Composition of soil, classification and effects of soil pollutants and their control. Hazardous Wastes: Classification – radioactive, biomedical and chemical, treatment and disposal – physical, chemical and biological processes.

Course outcomes:

1. Students will able to differentiate different unit systems.
2. Students will able to use different measuring instruments.
3. Students will learn about concepts of heat and motion.
4. Students will understand about pollution and its control.

Reference books:

1. Thermodynamics: P K Nag
2. Environmental pollution and control engineering: C. S. Rao
3. Hand book of industrial metrology – John W. Greve, Frank W. Wilson,PHI – New Delhi
4. Engineering Metrology – K.J. Hume, Macdonald and Co.(publisher) London

COMMUNICATION SKILLS

Semester -1st
Stream–Manufacturing
L T P Total Credits
3 0 0 3

Sessional – 25 Marks
Theory – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. To discuss types of communication and their forms
2. To improve comprehension
3. To improve spoken English and ability to articulate ideas
4. To improve formal writing skills

Unit 1: Introduction to Communication: Meaning, Importance and Function of Communication, Types of communication, language of communication; advantages and disadvantages; Barriers to Communication; Organizational Communication

Unit 2: Grammar: Parts of speech, Articles, Tenses, Formation of Sentences, Active and Passive Voice, Direct and Indirect speech.

Unit 3: Writing and Comprehension: Comprehension, Composition, Translation, Paraphrasing, Letter writing

Unit 4: 7 Cs of Communication; Grice's Cooperative Principle; Group Discussions; Public Speaking; Facing Interviews

Course Outcome:

1. To learn about communication process and ways to make communication effective by giving attention to all elements involved.
2. To improve grammar and gain confidence by enhancing their abilities to articulate their ideas.
3. To acquire better writing skills in formal communication.
4. To be able to revise documents for fruitful reading and comprehension.

Reference books:

1. Wren and Martin. *High School English Grammar and Composition.* New Delhi: RRP, 2007
2. Murphy, Raymond. *Essential English Grammar*. New Delhi: Cambridge, 2017

ENGINEERING CALCULATIONS

Semester 1st	Sessional – 25 Marks
Stream–Manufacturing	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives

1. To familiarize the prospective engineers with Basics of mathematics
2. To understand fundamental arithmetical operations.
3. To learn Unit systems, Fractions and Decimals, roots, percentage.
4. To have Knowledge of differential quantities

Course Contents

Unit-I: Basic Aptitude- Fundamental Arithmetical Operation- Addition, Subtraction, Multiplication and Division. Applied Workshop Problems Involving Addition, Subtraction, Multiplication and Division, System Of Units – Definition, Different Types & System Of Units i.e.(C.G.S. & SI Units for Length, Mass, Area, Volume, Capacity, Time) HCF, LCM, Square Root Cube Root.

Unit-II: Trigonometry – Introduction, Trigonometric Identities, Quadrant Rule, Trigonometric Ratios of Some Specific Angles, Ratios of Complementary Angles, Introduction

Unit-III: Differentiation- Introduction to Derivatives, Product Rule, Quotient Rule, Chain Rule, Derivatives of Algebraic Function, Derivative of Trigonometric Functions.

Unit –IV: Integration: concepts of integration, integration of trigonometric, exponential and logarithmic functions, integration by parts.

Unit-V: Algebra- Algebraic Expressions and Identities, Terms Coefficients and Factors, Monomials Binomials and Polynomials, Multiplication and Division of Algebraic Expressions, Standard Identities and Their Applications.

Course Outcomes:

1. To Apply the Arithmetical Operations and Conversion of Units.
2. To Convert in Fraction and Decimals, Percentage.
3. To Solve HCF, LCM, Square Roots and Cube Roots.
4. To Deal with Differential Problems.
5. To Learn About Trigonometric Ratios.

Reference Books:

1. Mathematics Book by R.D Sharma
2. Advanced Engineering Mathematics: By Jain Rk.
3. A Basic Course in Mathematics: By Nabjyoti Dutta.
4. Skills in Mathematics: By Amit M Aggarwal.

MANUFACTURING WORKSHOP –I

(Covering all the practicals of **ASC/Q3503***)*

Semester -1st
Stream–Manufacturing
L T P Total Credits
0 0 18 9

Internal – 25 Marks
External – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course objective:

1. To understand the safety measures of mechanical workshop.
2. To learn the functions of various conventional machines and unconventional machines.
3. To prepare different jobs by different machining operation.
4. To learn about CNC machine.

Course contents:

1. To Conduct all pre- machining operations:

a) Measure and mark reference points/ cutting lines on the work pieces, using compasses, callipers, rulers and other measuring tools

b) Understand the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions
c) Set of machine stops or guides as per the specified lengths indicated through scales or work instructions
d) Set-up, adjust machine tools, fixtures/ jigs and cutting tools in order to perform machining operations
e) Check the centering and facing of the work pieces and check for alignment of the work pieces as per the final product output specifications
f) Gain knowledge on gear changing techniques and minor maintenance as per checklist
g) Check the working of different holding fixtures, gears, stops.
h) Brush or spray lubricating material on work pieces where applicable
i) Operate hand wheels or valves in order to feed the component and allow cooling and lubricating to the tool.

2. To understand various safety measures, working principle & specifications of various conventional machines (lathe, milling, shaper, grinder etc).

3. To study elements of single point cutting tools and multiple point cutting tools.

4. To prepare single point brazed tool with carbide tip on a mild steel shank involving milling and brazing operation.

5. To prepare a job involving centering, facing, plain turning and step turning.

6. To prepare a job by machining on milling/ shaper machine.

7. To prepare a job by surface grinding on surface grinder and perform dressing and balancing of wheels

8. To study and use boring/ broaching/ hobbing / facing/ shaping tools in different applications.

9. To prepare a job by using blanking/ piercing and special purpose machines.

10. To prepare a job on CNC machine and ensure that the right command is entered in the CNC machine as defined machining parameters.

11. To conduct all post machining operations:

a. Use files, hand grinders, wire brushes, or power tools for performing de burring operations.
b. Use chisels, scrapers, and other hand tools and equipment to Trim, scrape, or de burr objects or parts

c. Clean the hydraulic tank/ Gauge/ Tools/ Fixtures as per the cleaning schedule and the process mentioned in the Work Instruction/ SOP manual

d. Perform minor repairs and adjustments to the machine and notify supervisor/maintenance team when major service/ repair is required

e. Measure the specifications of the finished component and verify conformance as per Control Plan/ Work Instruction

f. Use devices like micrometers, vernier calipers, gauges, rulers and any other inspection equipment for measuring specifications with valid calibration status.

g. Note down the observations of the basic inspection process and identify pieces which comply with the specified standards

h. Organize changing different worn out machine accessories

i. Ensure that the blunt tool is timely and safely replaced by a new tool

j. Replace machine part as per work instructions, using hand tools or notify supervisor/ engineering personnel for taking corrective actions

k. Ensure that the zero offset value is chosen at the time of tool changing process.

12. To maintain 5S at the work premises:

a. Ensure the work area, tools, equipment and materials are clean

b. Carry out storage of cleaning material and equipment in the correct location and in good condition

c. Ensure self-cleanliness - clean uniform, clean shoes, clean gloves,

d. Follow the daily cleaning standards and schedules to create a clean working environment

e. Carry out sorting of materials, tools and equipment's and spare parts

f. Follow proper labeling procedures

g. Follow proper storage procedures

h. Carry out segregation of waste into Hazardous and Non Hazardous waste and dispose the waste as per SOP

i. Follow the floor markings/ area markings used for demarcating the various sections in the plant

j. Follow 5S at workplace.

Course Outcomes: After studying this course the students will be able to:

1. Understand the safety measures of mechanical workshop.
2. Learn the functions of various conventional machines and unconventional machines.
3. Prepare different jobs by different machining operation.
4. Learn about CNC machine.

Reference books:

1. A course in workshop technology: manufacturing processes by B.S. Raghuwanshi.
2. Textbook of workshop technology by R S Khurmi and J k gupta.

SECOND SEMESTER

MANUFACTURING PROCESS – 2

Semester -2nd	Sessional – 25 Marks
Stream– B.Voc	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course objectives:

1) To study the various manufacturing processes.
2) To understand the working of various cutting tools.
3) To understand measurement and measuring instruments.
4) To introduce about NC and CNC machines.

UNIT 1: CENTRE LATHE: The centre lathe and its principle of working, Types of lathes, Lathe specification and size, Features of lathe bed, Head stock and tail stock, Feed mechanism and change-gears. carriage saddle, Cross slide, Compound rest, Tool post, Apron mechanism, lathe accessories, Chucks, Face plate, Angle plate, Driving plate, Lathe doges, mandrils, Steady rest, Lathe attachments, Lathe operations-plane and step turning, Taper turning, Screw cutting, Drilling, Boring, reaming, Knurling, Parting off, Under cutting, Relieving, Types of lathe tools and their uses, Brief description of semi-automatic lathes such as capstan and turret lathes, their advantages and disadvantages over centre lathe, types of job done on them. General and periodic maintenance of a centre lathe.

UNIT 2: MILLING MACHINES: Types of milling machines, constructional features of horizontal milling M/C. general maintenance of the machine, types of milling cutters, milling operations like plane milling, space milling, angular milling form milling, straddle milling, gang milling, Negative rake milling, cutting speed and speed for different tools in up and down milling. Simple, compound and differential indexing, milling of spur gears and racks.

UNIT 3: SHAPING, PLANING & SLOTTING MACHINES: Working principles of planer, shaper and Slotter, Differences and similarities among them, types of work done on them, types of tools used, their geometry, General and periodic maintenance of a shaper.

UNIT 4: DRILLING & BORING MACHINES: Types of tools used in drilling and boring. Classification of drilling and boring machines, principle of working and constructional details of simple and radial drilling M/C and general and periodic maintenance. Operations like facing, counter boring, tapering.

UNIT 5: GRINDING MACHINES: Common abrasives, grinding wheel materials, Bonds, Grain and grit of abrasive, Grain structure and shapes of common wheels, various speeds and feeds, Use of coolants, Methods of grinding, Types of grinding machines, precision finishing operations like honing. Broaching machines: Types of work done on broaching machine. Simple types of broaches and their uses, Types of broaching machines.

UNIT 6: JIGS AND FIXTURES: Object of Jigs and Fixture, Difference between jigs and fixtures, Locating and clamping devices. Types of jigs, Simple example of milling, turning, grinding, horizontal boring fixtures and broaching fixtures.

Course outcomes:

1) Students will able to differentiate between various manufacturing processes.
2) Students will able to use different measuring instruments.
3) Students will learn about different machining operation.
4) Students will understand about NC and CNC machines.

Reference books:

1. Workshop Technology, Vol. I: Hazra & Chaudhry
2. Workshop Technology, Vol. I: BS Raghuwanshi
3. Karyashala Takniki: JK Kapoor

QUALITY, INSPECTION AND SAFETY

Semester -2nd
Stream– B.Voc
L T P Total Credits
3 0 0 3

Sessional – 25 Marks
Theory – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course objectives:

1. To understand the importance of safety, health and environment.
2. To classify different types of accidents.
3. To study different types of hazards.
4. To study about 5S at workplace.

UNIT-1: Importance of Safety, health and environment

Safety, Health and Environment, cleaning of work area, tools, equipment and materials, Importance of safety, objectives of safety management, personal protective equipment like safety gloves, safety glasses, safety shoes and safety helmet, contents of the first aid kit, instructions of equipment manual.

UNIT-2: **Accidents**: Classification of accidents, causes of accidents, accident investigations/reporting, approaches to prevent accidents, Firefighting.

UNIT -3: **Safety in hazardous area:** Hazards and risks, difference between hazard and risk, Hazard in industrial zones, physical, chemical, environmental, biological, ergonomics and psycho-social hazards, Introduction to OSHMS, OSHAS 18001 and OSHA.

UNIT-4: 5S in safety: The basic principles of 5 S in manufacturing and workplace – Cleaning, sorting etc, sorting of materials, tools and equipment's and spare parts, standards, procedures and

policies related to 5S, importance of waste disposal, segregation of waste into Hazardous and Non Hazardous waste, disposal the waste as per SOP, labeling procedures, storage procedures.

Unit–5: Inspection: how to measure the correct specifications of the output in the terms of thickness, hardness, durability, tightness, finesse etc. relevant manufacturing standards and procedures followed in the company in detail, different types of defects which may arise due to improper manufacturing

Unit–6 Quality control: Concept of quality control. elements of quality control, quality control groups, objectives of quality control. Statistical quality control, objectives of S.Q.C. Inspection by variables & attributes. Frequency distribution, mean, median & mode, standard deviation, X-R charts, P-Charts, C-Charts and acceptance sampling. (i) I.S.O. 9000 (ii) KAIZEN (iii) Six Sigma (iv) 5S (v) TQM system, concept & brief idea only.

Course outcomes:

1. Student will aware about safety and health.
2. Student will able to differentiate different types of accidents.
3. Student will able to differentiate different types of risks.
4. Student will learn about 5S at workplace.

Reference books:

1. Industrial Safety and Health Management by C Ray Asfahl, pearson publications.
2. Industrial Safety Management by N. K. Tarafdar
3. Industrial Safety (Safety Management) by D S S Ganguly & C S Changeriya

APPLIED SCIENCE

Semester -2nd	Sessional – 25 Marks
Stream– B.Voc	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives: Following are the objectives of this course:

1) To Learn concepts of Units, Laws of vectors, parallel forces, moment of force, couple.

2) To Learn the fundamentals of properties and behavior of the materials

3) Understand different types of communication systems

4) To know fundamental of advanced communication systems.

Course Contents:

Unit – I Basics of mechanics and force system: Significance and relevance of Mechanics, Statics, Dynamics. Space, time, mass, particle, flexible body and rigid body. Scalar and vector quantity, Units of measurement (SI units) - Fundamental units and derived units. Force – unit, representation as a vector and by Bow's notation, characteristics and effects of a force, Principle

of transmissibility of force, Force system and its classification. Resolution of a force - Orthogonal components of a force, moment of a force, Varignon's Theorem. Composition of forces – Resultant, analytical method for determination of resultant for concurrent, non-concurrent and parallel co-planar force systems – Law of triangle, parallelogram and polygon of forces.

Unit– II Properties of solids: Definitions of deforming force, elasticity and plasticity, examples for elasticity and plasticity, definition of stress and its types with examples and its S.I unit, definition of strain and its types with examples, elastic limit, Hooke's law, stress - strain graph with explanation. Modulus of elasticity and its types, derivation of an expression for Young's modulus of a material. Definition of Compressibility and factor of safety. Simple problems on stress, strain and Young's modulus. Properties of liquids: Definition of thrust and pressure with S.I units. Definition of surface tension and its S.I unit, Viscosity.

Unit– III Transmission of heat: Definitions of conduction, convection and radiation with examples, definition of thermal conductivity, co-efficient of thermal conductivity(K) and its S.I unit. Applications of conduction, convection and radiation.

Unit– IV Thermodynamics: Introduction of thermodynamics, system, surrounding and boundary, types of system, properties of system, state, equilibrium and process, types of thermodynamic processes, laws of thermodynamics- zeroth, First, second and third law.

Unit– V Electromagnetic waves: Definition, generation of electromagnetic waves and their properties. Electromagnetic spectrum: Definition, classification and its applications. Lasers: Principle and listing the types of Laser, properties of Laser, applications. Nano-Technology: Definition of Nano-Technology, advantages and dis-advantages of nano Technology.

Course outcomes: After completing this course, student will be able to:

1. Identify the force systems for given conditions by applying the basics of mechanics.
2. Create knowledge of properties of matter applicable to engineering.
3. Analyse the different concepts of waves and vibration in the field of engineering
4. Analyse the recent trends in physics related to engineering.

Reference Books: -

1. D.S. Bedi, Engineering Mechanics, Khanna Publications, New Delhi (2008)
2. Khurmi, R.S., Applied Mechanics, S. Chand & Co. New Delhi.
3. Bansal R K, A text book of Engineering Mechanics, Laxmi Publications.
4. Ramamrutham, Engineering Mechanics, S. Chand & Co. New Delhi.

EMPLOYABILITY SKILLS

Semester -2nd
Stream– B.Voc
L T P Total Credits
3 0 0 3

Sessional – 25 Marks
Theory – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1) To discuss types of communication and their forms.
2) To improve employability skills.
3) To improve spoken English and ability to articulate ideas
4) To improve entrepreneurship skills.

Course Contents:

Unit 01 Communication skill, Oral and written communication Listening skills, written communications, motivation, ethics, Time management, facing job interviews, behaviour skills, Assessing oneself.

Unit -02 English Literacy – Pronunciation, listing speaking and reading: - greetings and introductions describing people, Telephone skills, Office Hospitality, Describing things.

Unit -03 Entrepreneurship skills- 1: - Scope and advantage of self-employment, Entrepreneurial skills, values and attitudes, Characteristics of Successful Entrepreneurs, Identification of entrepreneurs bu self-assessment, Micro, small and medium enterprises, Creativity and idea generation.

Unit -04 Entrepreneurship Skills – 2: - Understanding Consumer, Market Survey: Scope & Influence of publicity and advertisement, Accounting and analysis, Assistance provided by Central and State Govt. Organizations, Project formation, feasibility and profitability estimates, Filling up a Preliminary Project Report Proforma, Investment procedure-loan procurement.

Course Outcome:

1. To learn about communication process and ways to make communication effective by giving attention to all elements involved.
2. To improve grammar and gain confidence by enhancing their abilities to articulate their ideas.
3. To acquire better writing skills in formal communication.
4. To be able to revise documents for fruitful reading and comprehension.

Reference Reading:

1) Wren and Martin. *High School English Grammar and Composition.* New Delhi: RRP, 2007
2) Murphy, Raymond. *Essential English Grammar*. New Delhi: Cambridge, 2017
3) Malhotra, Prerna and Halder, Deb. *Communication Skills: Theory and Practice*

WORKSHOP –II

(Covering all the practicals of ASC/Q3505*)*

Semester -1st	Internal – 20 Marks
Stream– Manufacturing	External – 30 Marks
L T P Total Credits	Total: 50 Marks
0 0 18 18	Duration of Exam: 3 Hours

Course objective:

1) To understand the safety measures of mechanical workshop.
2) To learn the functions of various conventional machines and unconventional machines.
3) To prepare different jobs by different machining operation.
4) To learn about CNC machine.

Course contents:

A) . To Conduct all pre- machining operations:

1. Measure and mark reference points/ cutting lines on the work pieces, using compasses, callipers, rulers and other measuring tools
2. Understand the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions
3. Set of machine stops or guides as per the specified lengths indicated through scales or work instructions
4. Set-up, adjust machine tools, fixtures/ jigs and cutting tools in order to perform machining operations
5. Check the centering and facing of the work pieces and check for alignment of the work pieces as per the final product output specifications
6. Gain knowledge on gear changing techniques and minor maintenance as per checklist
7. Check the working of different holding fixtures, gears, stops.
8. Brush or spray lubricating material on work pieces where applicable
9. Operate hand wheels or valves in order to feed the component and allow cooling and lubricating to the tool.

B) To Conduct all machining operations:

1. To perform exercise on centre lathe such as facing, plain turning, step turning, chamfering and thread cutting operations.
2. To perform reaming, parting off and knurling operation by using lathe.
3. To perform the drilling and boring operations by using lathe machine.

4. To perform shaping operation of given mild steel rod.
5. To prepare a job by machining on milling machine.
6. To Prepare a 'V' block on a rectangular block on shaping machine.
7. To grind the single point cutting tool with the given nomenclature and measure angles using tool maker's microscope.
8. To perform exercise on shaping machine to obtain flat surfaces and key way.
9. To prepare a job by using planar, shaper and slotting machine.
10. To perform the operations such as drilling, counter boring and tapping using drilling machine.
11. To make a slot on the given work piece.
12. To prepare a job by surface grinding on surface grinder and perform dressing and balancing of wheels.
13. To study and use broaching machine in different applications.
14. To study a progressive tool and perform blanking and piercing.
15. To make rod/pipe bending using Hydraulic press (or) to perform Bending Operation.

C). <u>To conduct all post machining operations:</u>

1. Use files, hand grinders, wire brushes, or power tools for performing de burring operations.
2. Use chisels, scrapers, and other hand tools and equipment to Trim, scrape, or de burr objects or parts
3. Clean the hydraulic tank/ Gauge/ Tools/ Fixtures as per the cleaning schedule and the process mentioned in the Work Instruction/ SOP manual
4. Perform minor repairs and adjustments to the machine and notify supervisor/maintenance team when major service/ repair is required
5. Measure the specifications of the finished component and verify conformance as per Control Plan/ Work Instruction
6. Use devices like micrometers, vernier calipers, gauges, rulers and any other inspection equipment for measuring specifications with valid calibration status.
7. Note down the observations of the basic inspection process and identify pieces which comply with the specified standards
8. Organize changing different worn out machine accessories
9. Ensure that the blunt tool is timely and safely replaced by a new tool

10. Replace machine part as per work instructions, using hand tools or notify supervisor/ engineering personnel for taking corrective actions
11. Ensure that the zero offset value is chosen at the time of tool changing process.

D). <u>To maintain 5S at the work premises:</u>

1. Ensure the work area, tools, equipment and materials are clean
2. Carry out storage of cleaning material and equipment in the correct location and in good condition
3. Ensure self-cleanliness - clean uniform, clean shoes, clean gloves,
4. Follow the daily cleaning standards and schedules to create a clean working environment
5. Carry out sorting of materials, tools and equipment's and spare parts
6. Follow proper labeling procedures
7. Follow proper storage procedures
8. Carry out segregation of waste into Hazardous and Non Hazardous waste and dispose the waste as per SOP
9. Follow the floor markings/ area markings used for demarcating the various sections in the plant
10. Follow 5S at workplace.

Course Outcomes: After studying this course the students will be able to:

1. Understand the safety measures of mechanical workshop.
2. Perform the operations on various conventional machines and unconventional machines.
3. Prepare different jobs by different machining operation.
4. Learn about CNC machine.

Reference books:

1. A course in workshop technology: manufacturing processes by B.S. Raghuwanshi.
2. Textbook of workshop technology by R S Khurmi and J k gupta.
3. Workshop Technology Vol I & II –Hazra & Chaudhary, Asian Book Comp., New Delhi.

THIRD SEMESTER

MACHINING AND MACHINE TOOLS

Semester -3rd
Stream– B.Voc (M)
L T P Total Credits
3 0 0 3

Sessional – 25 Marks
Theory – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course objectives:

1) To study the various machine tools.
2) To understand the working of lathe machine.
3) To understand operations of shaping, planning and slotting machins.
4) To introduce about NC and CNC machines.

UNIT-1

CENTRE LATHE: The centre lathe and its principle of working, Types of lathes, Lathe specification and size, Features of lathe bed, Head stock and tail stock, Feed mechanism and change-gears. carriage saddle, Cross slide, Compound rest, Tool post, Apron mechanism, lathe accessories, Chucks, Face plate, Angle plate, Driving plate, Lathe doges, mandrils, Steady rest, Lathe attachments. Lathe operations-plane and step turning, Taper turning, Screw cutting, Drilling, Boring, reaming, Knurling, Parting off, Under cutting, Relieving, Types of lathe tools and their uses, Brief description of semi-automatic lathes such as capstan and turret lathes, their advantages and disadvantages over centre lathe, types of job done on them, General and periodic maintenance of a centre lathe.

UNIT-2

SHAPING, PLANING & SLOTTING MACHINES: Working principles of planer, shaper and Slotter, Differences and similarities among them, quick return mechanism applied to the machines, types of work done on them, types of tools used, their geometry. General and periodic maintenance of a shaper DRILLING & BORING MACHINES: Types of tools used in drilling and boring, Classification of drilling and boring machines, principle of working and constructional details of simple and radial drilling M/C and general and periodic maintenance. Operations like facing, counter boring, tapering.

UNIT -3

MILLING MACHINES Types of milling machines, constructional features of horizontal milling M/C. general maintenance of the machine, types of milling cutters, milling operations like plane

milling, space milling, angular milling form milling, straddle milling, gang milling, Negative rake milling, cutting speed and speed for different tools in up and down milling. Simple, compound and differential indexing, milling of spur gears and racks**.**

UNIT-4

GRINDING MACHINES: Common abrasives, grinding wheel materials, Bonds, Grain and grit of abrasive, Grain structure and shapes of common wheels, various speeds and feeds, Use of coolants, Methods of grinding. Types of grinding machines, precision finishing operations like honing BROACHING MACHINES: Types of work done on broaching machine. Simple types of broaches and their uses, Types of broaching machines

UNIT 5

JIGS AND FIXTURES: Difference between jigs and fixtures, Principle of location. Principle of clamping, Locating and clamping devices, Types of jigs & fixtures,

AUTOMATION OF MACHINE TOOLS: Introduction to CNC lathe (Computer Numerical Control Lathe) and FMS (Flexible Manufacturing System) Introduction only.

Course Outcomes:

1) Students will able to differentiate between various machining tools.
2) Students will able to perform lathe, milling and shaping machines.
3) Students will learn about different machining operation.
4) Students will understand about NC and CNC machines.

Reference books:

1) Manufacturing technology by P. N. Rao
2) Production technology- R. K. Jain
3) Manufacturing Science- Amitabha Ghosh & Ashok Kumar Malik, - East- West Press.
4) Workshop Technology Vol I & II –Hazra & Chaudhary, Asian Book Comp., New Delhi.

MATERIAL SCIENCE

Semester -3rd
Stream– B.Voc (M)
L T P Total Credits
3 0 0 3

Sessional – 25 Marks
Theory – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course objectives:

1. To study the materials structure and their deformation.
2. To understand the ferrous metals.
3. To understand about non metallic materials.
4. To introduce about heat treatment.

GENERAL: Brief introduction to the subject metallurgy and its scope in engineering field, classification of materials of industrial importance. Their chemical thermal, electrical, magnetic, mechanical and technological properties and their selection criteria for use in industry

UNIT-1: STRUCTURE OF METALS AND THEIR DEFORMATION:

Structure of metals and its relation to their physical, mechanical and technological properties, Elementary idea of arrangement of atoms in metals, molecular structures, crystal structures and crystal imperfections, Deformation of metals, effects of cold and hot working operations over them. Recovery re-crystallization and grain growth, solid solutions, alloys and inter metallic compounds, effect of grain size on properties of metals.

UNIT 2: METALS-FERROUS METALS

(a) Classification of iron and steel. (b) Cast iron types as per I.S. - White, malleable, Grey (c) Steels: Classification of steels according to carbon content and according to use as per I.S. Mechanical properties of various steels and their uses. Availability of steel in market, Its forms and specifications (d) Alloy Steel: Effect of alloying various elements, viz Cr, Hi, Co, V,W, Mo, Si, and Mn, on mechanical properties of steel, Common alloy steels, viz, Ni-steel, Ni-Cr-steel, Tungsten steel, Cobalt steel, Stainless Steel, Tool steel- High Carbon Steel, High Speed steel, Tungsten Carbide, Silicon manganese steel, Spring Steel, Heat Resisting alloy Steels etc.

UNIT 3: NON-METALIC MATERIALS

(a) Plastic and Other Synthetic Materials: Plastics-Important Sources-Natural and Synthetic, Classification, thermo-set and thermoplastic, Various trade names, Important Properties and engineering use of plastics. Market forms of Plastics

(b) Paints, Enamels, Varnishes and Lacquers: Paints and Enamels-types, its purpose, essential ingredients and their role, characteristics of a good paints and enamel, trade names of some important types of products. Varnishes-types purpose of varnish, essential ingredients and their role, characteristics, preparation, trade names storage of varnish, Lacquer- characteristics, preparation and uses

UNIT 4: NON-METALIC MATERIALS

Heat Insulating Materials: Classification of Heat Insulating material, properties and uses of China clay, Cork, Slag wool, Glass Wool, Thermocole, Puff, Properties and uses of asbestos as filler material. Hardware: General specification, uses and methods of storage of G.I. and C.I. steel,

Copper, A.C. pressure conduits, R.C.C. spun, P.V.C. Pipes and their uses. General sheets specification (I.S.) and uses, Method of storage of G.I. sheets, M.S. sheets, General specification of pipe fitting

UNIT 5: HEAT TREATMENT OF METALS

Elementary concept, purpose, Iron-carbon equilibrium diagram. T.T.T. and `S' curve in steels and its significance, Hardening, Tempering, Annealing, Normalising and case hardening

Course Outcomes:

1) Students will able to differentiate between various ferrous and non ferrous materials.
2) Students will able to understand about structure of materials.
3) Students will learn about non metallic materials.
4) Students will understand about heat treatment of materials.

Reference books:

1) Manufacturing technology by P. N. Rao
2) Production technology- R. K. Jain
3) Manufacturing Science- Amitabha Ghosh & Ashok Kumar Malik, - East- West Press.
4) Workshop Technology Vol I & II –Hazra & Chaudhary, Asian Book Comp., New Delhi.

IT TOOLS

Semester -3rd	Sessional – 25 Marks
Stream– B.Voc (A)	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Unit 1: Computer Organization & OS: User perspective.

- Understanding of Hardware.
- Basics of Operating System.

Unit 2: Networking and Internet.

- Network Safety concerns.
- Network Security tools and services.
- Cyber Security.
- Safe practices on Social networking.

Unit 3: Office automation tools:

- Spreadsheet.
- Word processing.
- Presentation.

Unit4: Multi Media Design: (Open Source Design Tools).

- Interface and Drawing Tools in GIMP.
- Applying Filters.
- Creating and handling multiple layers.
- Using Stamping and Smudging tools.
- Importing pictures.

Unit 5: Troubleshooting: Hardware, Software and Networking.

- Commonly encountered problems.
- (Monitor: No display, KB/Mouse not responding, monitor giving beeps, printer not responding, check for virus, Delete temporary files if system is slow, adjust mouse speed).

Work Integrated Learning IT – ISM

- Identification of Work Areas.
- Work Experience.

Reference Books:

1. IT Tools, R.K. Jain, Khanna Publishing House
2. Information Security & Cyber Laws, Sarika Gupta, Khanna Publishing House
3. Mastering PC Hardware & Networking, Ajit Mittal, Khanna Publishing House

SOFT SKILLS

Semester -3rd
Stream– B.Voc (AM)
L T P Total Credits
4 0 0 4

Sessional – 25 Marks
Theory – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1) To help the students in building interpersonal skills.
2) To develop skill to communicate clearly.
3) To enhance team building and time management skills.
4) To learn active listening and responding skills.

UNIT 1: GRAMMAR AND VOCABULARY

1.Tenses, 2. Subject–verb agreement. 3. Sentence Analysis: Simple, Compound and Complex sentences. 4. Phrases: Adjective, Adverb and Noun Phrase, 5. Clauses: Adjective, Adverb and Noun Phrase. 6. Voice, Narration, Gerund, Participle.

UNIT 2: ORAL COMMUNICATION

1. Listening Skill – Active listening, Barriers to active listening. 2. Speaking Skill-Stress patterns in English, 3. Questioning skills, 4. Barriers in Speaking 5. Reading Skill-Skimming, Scanning, Intensive reading, 6. linking devices in a text, 7. Different versions of a story/ incident.

UNIT 3: WRITING SKILLS

Letter writing, Business letters • Application letters • Covering letters • Report writing o Academic report o Business report o Technical report o Technical project report • Job Application and Resume writing

UNIT- IV: SOFT SKILLS

1.Body Language– Gesture, posture, facial expression. 2. Group Discussion– Giving up ofPREP, REP Technique. 3. Presentation Skills: a. (i) How to make power point presentation b. (ii) Body language during presentation 4. Resume writing: Cover letter, career objective, Resume writing (tailor made) 5. Interview Skills: Stress Management, Answering skills.

UNIT- 5: STRESS AND TIME MANAGEMENT

Introduction • Stress In Today's Time • Identifying The Stress Source • Signs Of Stress • Ways To Cope With Stress • Healthier Ways To Deal With Stress • Time Management • Prioritize Your Work • Smart Work • Four Ds Of Decision Taking.

REFERENCE BOOKS:

1) Advanced English Usage: Quirk & Greenbaum; Pearson Education.
2) Developing Communication Skills: Banerjee Meera & Mohan Krishna; Macmillan Publications, 1990.
3) Personality Development and Group Discussions by Barun K. Mitra, Oxford University Press

WORKSHOP-3

Semester -3rd
Stream– B.Voc (A/M)
L T P Total Credits
0 0 8 10

Internal – 25 Marks
External – 25 Marks
Total: 50 Marks
Duration of Exam: 3 Hours

1: INTRODUCTION TO AUTOCAD

Starting AutoCAD, AutoCAD Screen Components (Drawing Area Command Window Navigation bar Status bar), Invoking Commands inAutoCAD Keyboard(Ribbon Application

Menu Tool Palettes Menu Bar Toolbar), Shortcut Menu, AutoCAD Dialog Boxes, Starting a New Drawing (Open a Drawing Start from Scratch Use a Template Use a Wizard, Saving Your Work, Save Drawing as Dialog box), Using the Drawing Recovery Manager to Recover Files, Closing a Drawing, Opening an Existing Drawing, Opening an Existing Drawing Using the Select File Dialog Box Opening an Existing Drawing Using the Startup Dialog Box Opening an Existing Drawing, Using the Drag and Drop Method, Quitting AutoCAD, Creating and Managing Workspaces Creating a New Workspace Modifying the Workspace Settings Autodesk Exchange

2: GETTING STARTED WITH AUTOCAD

Dynamic input mode, Enable Pointer Input, Enable Dimension Input where possible Show command prompting and command input near the crosshairs, Drafting Tooltip Appearance, Drawing Lines in autocad, The Close Option, The UndoOption, Invoking tools Using Dynamic INPUT/Command Prompt Coordinate Systems, Absolute Coordinate System, Relative Coordinate System, Relative Polar Coordinates, Direct Distance Entry Erasing Objects, Cancelling and Undoing a Command Object Selection Methods, Window Selection Window Crossing Method Drawing a Circle, BASIC Display Commands Setting Units Type and Precision, Specifying the Format Specifying the Angle Format, setting the limits of a drawing.

3: STARTING WITH ADVANCED SKETCHING

Drawing Arcs, Drawing Rectangles, Drawing Ellipses, Drawing Regular Polygon, Drawing Polylines Placing Points, Drawing Infinite Lines Writing a Single Line Text

4: WORKING WITH DRAWING AIDS

Introduction, Understanding the Concept and use of LAYERS, Advantages of Using Layers, Working with Layers, Creating New Layers, Making a Layer Current, Controlling the Display of Layers, Deleting Layers, Object Properties Changing the Colour, Changing the Line type, Changing the Line weight, Changing the Plot Style, Properties Palette, Quick Properties, Palette Drafting, Settings dialog box, Setting Grid, Setting Snap, Snap Type, Drawing Straight Lines using the Ortho Mode, Working with Object Snaps, Auto Snap, Endpoint Midpoint, Nearest Centre, Tangent Quadrant Intersection, Apparent Intersection Perpendicular, Node

Insertion, Snap to None Parallel Extension From, Midpoint between 2 Points, Temporary Tracking Point, Combining Object Snap Modes, Running Object, Snap Mode, Overriding the Running Snap, Cycling through Snaps, Using Auto Tracking, Object Snap Tracking, Polar Tracking, Auto Track Settings, Function and Control Keys.

5: EDITING SKETCHED OBJECTS-I

Editing Sketches, Moving the Sketched Objects, Copying the Sketched Objects, Creating Multiple Copies, Creating a Single Copy, Offsetting Sketched Objects, Rotating Sketched Objects, Scaling the Sketched Objects, Filleting the Sketches, Chamfering the Sketches, Trimming the Sketched Objects, Extending the Sketched Objects, Stretching the Sketched Objects, Lengthening the Sketched Objects, Arraying the Sketched Objects, Rectangular Array Polar Array, Path Array, Mirroring the Sketched objects Text Mirroring.

6: EDITING SKETCHED OBJECTS-II

Introduction to Grips Types of Grips, Editing a Polyline by Using Grips Editing Gripped Objects ,Changing the Properties Using the PROPERTIES Pale Matching the Properties of Sketched Objects, Cycling Through Selection, Managing Contents Using the Design enter Autodesk Seek design content Link Displaying Drawing Properties, Basic Display Options Redrawing the Screen Regenerating Drawings, Zooming Drawings Real-time Zooming All Option, Centre Option Extents Option Dynamic Option Previous Option Window Option Scale Option Object Option Zoom In and Out, Panning Drawings Panning in Real time.

7: CREATING TEXT AND TABLES

Annotative Objects Annotation Scale, Assigning Annotative Property and Annotation Scales Customizing Annotation Scale, Multiple Annotation Scales, Assigning Multiple Annotation Scales Manually Assigning Multiple Annotation Scales Automatically, Controlling the Display of Annotative objects Creating Text, Writing Single Line Text Entering Special Characters Creating Multiline Text, Text Window Text Editor Tab, Editing Text, Editing Text Using the DDEDITCommand Editing Text Using the Properties Palette Modifying the Scale of the Text, Inserting Table in the Drawing Table style Area, Insert options Area Insertion behaviour Area, Column and row settings Area Set cell styles Area, Creating a New Table Style Starting table

Area General Area, Cell styles Area, Setting a Table Style as Current Modifying a Table Style Modifying Tables, Substituting Fonts, Specifying an Alternate Default Font Creating Text Styles, Determining Text Height Creating Annotative text

8: BASIC DIMENSIONING, GEOMETRIC DIMENSIONING, AND TOLERANCING

Need for Dimensioning in AutoCAD Fundamental Dimensioning Terms, Dimension Line, Dimension Text Arrowheads Extension Lines Leader, Centre Mark and Centrelines Alternate Units, Tolerances Limits, Associative Dimensions Definition Points Annotative Dimensions, Selecting Dimensioning Commands Using the Ribbon and the Toolbar Using the Command Line, Dimensioning a Number of Objects Together Creating Linear Dimensions, DIMLINEAR Command Options Creating Aligned Dimensions Creating Arc Length Dimensions Creating Rotated Dimensions Creating Baseline Dimensions Creating Continued Dimensions Creating Angular Dimensions, Dimensioning the Angle between Two Nonparallel Lines Dimensioning the Angle of an Arc, Angular Dimensioning of Circles, Angular Dimensioning based on Three Points Creating Diameter Dimensions, Creating Radius Dimensions Creating Jogged Linear Dimensions Creating Ordinate Dimensions, Maintaining Equal Spacing between Dimensions Creating Inspection Dimensions, Inspection Label Dimension Value, Working with True Associative Dimensions Inspection Rate, Removing the Dimension Associatively, Converting a Dimension into a True Associative Dimension Drawing Leaders, Multileader, Adding leaders to existing Multileader, Removing Leaders from Existing Multileader, Aligning Multileaders, Distribute, Make leader segments Parallel Specify Spacing, Use current spacing, Geometric Dimensioning and Tolerance Geometric Characteristics and Symbols Adding, Geometric Tolerance, Feature Control Frame, Geometric Characteristics Symbol, Tolerance Value and Tolerance Zone Descriptor Material Condition Modifier, Datum, Complex Feature Control Frames Composite Position Tolerance Projected Tolerance Zone, Creating Annotative Dimensions, Tolerances, Leaders, and Multileaders

9: EDITING DIMENSIONS

Editing Dimensions Using Editing Tools Editing Dimensions by Stretching, Editing Dimensions by Trimming and Extending Flipping Dimension Arrow, Modifying the

Dimensions Editing the Dimension Text Updating Dimensions, Editing Dimensions with Grips, Editing Dimensions using the Properties Palette Properties Palette (Dimension), Properties Palette (Multileader), Model Space and Paper Space Dimensioning

10: DIMENSION STYLES, MULTILEADER STYLES, AND SYSTEM VARIABLES

Using Styles and Variables to Control Dimensions Creating and Restoring Dimension Styles, New Dimension Style dialog box Controlling the Dimension Text Format Fitting Dimension Text and Arrowheads Formatting Primary Dimension Units Formatting, Alternate Dimension Units Formatting the Tolerances, Creating and Restoring Multileader Styles Modify Multileader Style dialog box.

11: MODEL SPACE VIEWPORTS, PAPER SPACE VIEWPORTS, AND LAYOUTS

Model Space and Paper Space/Layouts Model Space Viewports (Tiled Viewports), Creating Tiled Viewports Making a Viewport Current Joining Two Adjacent Viewports, Paper space viewports (Floating Viewports) Creating Floating Viewports, Creating Rectangular Viewports Creating Polygonal Viewports, Converting an Existing Closed Object into a Viewport Temporary Model Space, Editing Viewports, Controlling the Display of Objects in Viewports Locking the Display of Objects in Viewports Controlling the Display of Hidden Lines in Viewports Clipping Existing Viewports, Maximizing Viewports Inserting Layouts, Inserting a Layout Using the Wizard Defining Page Settings, Controlling the Display of Annotative Objects in Viewports

12: PLOTTING DRAWINGS

Plotting Drawings in AutoCAD, Plotting Drawings Using the Plot Dialog Box Page setup Area, Printer/plotter Area Paper size Area Number of copies Area Plot area, Plot offset (origin set to printable area) Area Plot scale Area, Plot style table (pen assignments) Area Shaded viewport options Area, Plot options Area Preview, Adding Plotters, The Plotter Manager Tool Using Plot Styles, Adding a Plot Style

13: HATCHING DRAWINGS

Hatching, Hatch Patterns Hatch Boundary, Hatching Drawings Using the Hatch Tool Panels in the Hatch Creation Tab, Boundaries Panel Pattern Panel Properties Panel Origin Panel Options Panel Match Properties, Setting the Parameters for Gradient Pattern Creating Annotative Hatch, Hatching the Drawing Using the Tool Palettes Drag and Drop Method, Select and Place Method, Hatching Around Text, Dimensions, and Attributes

14: WORKING WITH BLOCKS

The Concept of Blocks Advantages of Using Blocks Drawing Objects for Blocks, Converting Entities into a Block Inserting Blocks, Creating and Inserting Annotative Blocks Block Editor, Adding Blocks in Tool Palettes Drag and Drop Method, Modifying Existing Blocks in the Tool Palettes, Layers, Colours, Line types, and Line weights for Blocks Nesting of Blocks, Creating Drawing Files using the Write Block Dialog Box Exploding Blocks Using the XPLODE Command Renaming Blocks, Deleting Unused Blocks Editing Constraints to Block.

FOURTH SEMESTER

Students will go in industries for On Job Training. Students will be evaluated based upon On Job Training (OJT)/Internship including report and presentation.

FIFTH SEMESTER

Students will go in industries for On Job Training. Students will be evaluated based upon On Job Training (OJT)/Internship including report and presentation.

SIXTH SEMESTER

QUALITY CONTROL TECHNIQUES

Semester - VI	Sessional – 25 Marks
Stream– B.Voc (AM)	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1) To introduce about quality control techniques.
2) To learn QC tools.
3) To understand Trends in Quality Engineering & Management.

Course Contents:

Unit I: For the complete syllabus, results, class timetable and more kindly download iStudy. It's a lightweight, easy to use, no images, no pdfs platform to make student's life easier.

Unit II: Quality Engineering and Management Tools, Techniques & Standards: 7 QC tools, 7 New Quality Management Tools, 5S Technique, Kaizen, Poka-Yoke, Quality Circle, Cost of Quality Technique. Introduction to Quality Management Standards-ISO: 9000, ISO:14000, QS:9000 (Concept, Scope, Implementation Requirements & Barriers, and Benefits), Introduction to National and International Quality Awards (Malcolm Baldrige National Quality Award-MBNQA, The Deming Prize Rajiv Gandhi National Quality Award).

Unit III: Basic Philosophy, Approach, Implementation Requirements & Barriers. Designing for Quality: Introduction to Concurrent Engineering, Quality Function Deployment (QFD) and Failure Mode and Effect Analysis (FMEA)-Concept, Methodology and Application (with case studies).

Unit V: Contemporary Trends in Quality Engineering & Management: Six Sigma-Basic Concept, Principle, Methodology, Implementation, Scope, Advantages and Limitation of all as applicable. Quality in Service Sectors: Characteristics of Service Sectors, Quality Dimensions in Service Sectors, Measuring Quality in Different Service Sectors.

Books and References:

1. Quality Control & Application by B. L. Hanson & P. M. Ghare, Prentice Hall of India.
2. Quality Management by Kanishka Bedi.
3. Statistical Quality Control by M. Mahajan, Dhanpat Rai & Co. (P) Ltd.

INDUSTRIAL MANAGEMENT

Semester - VI	Sessional – 25 Marks
Stream– Automobile	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

1. Introduction: Growth of industry, The management of men, materials and machines, the art of management, Sources of capital- industrial individual enterprise, private partnership and private Ltd. Co., Joint Stock Co. shares, debentures, financial agencies and their role in promoting industries. Break even analysis.

2. Private sector and public sector: Public sector enterprise, merits and demerits of public sector industry and private sector industry, Line, staff and functional organizations, reasons for the choice of various types of organization, functions of different departments, viz. stores, purchase and sales departments relationship between individual departments.

3. Wages & incentives: Definition of wages, real wage and nominal wage, systems of wage payment, incentives, financial and non - financial incentives, Essentials of a good wage plan, essentials of a good incentive scheme. Introduction to elements of cost & indirect expenses, Material cost, labour cost, fixed and variable overheads, components of cost, selling price, Factory expenses, administrative expenses, selling & distribution expenses, depreciation, obsolescence, interest on capital, Idleness, Repair and maintenance.

4. Labour, industrial & tax laws: Evolution of industrial law, factory act, workmen compensation act, payment of wages act, employee's state insurance act, Industrial dispute act. Role of technician in industry: Position of technician in various engineering departments, Role of a supervisor in industry, Foremanship, duties and qualities of a good foreman.

5. Material management: Introduction, Scope of Material Management selective control techniques-ABC analysis, Material handling, inventory control, Essential steps in inventory control, quality standards

Reference Books: 1. Industrial Management, S.C. Sharma, Khanna Publishing House

ENTREPRENEURSHIP

Semester - VI	Sessional – 25 Marks
Stream– Automobile	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

1. Entrepreneurship and entrepreneur: Need of Employment and Opportunities, Essential Characteristics of a good Entrepreneur, Industrial Policy, Classification of industries- Micro, small scale , Medium scale, Large scale, Type of industries- Production, Job based & Service

2. Entrepreneurial Development: Product identification/ selection, Site selection, Plant layout,

Institutional support needed, Pre-market survey.

3. Entrepreneurship Support System and Start-ups: Introduction to start-up's, Role of District Industries Centre in setting up industry, Function of NSIC, SISI, NISIET, NRDC, SSIC, SIDO, NMTC, KVIC, RSMML, Role of state finance corporation, state electricity corporations, pollution control board, BIS, I.S.O. etc.

4. Introduction to Tax System, Insurance and Acts: Idea of income tax, sales tax, excise duty and custom duty, Industrial and fire insurance, procedure for industrial insurance, Introduction to Industrial acts, factory act, Workmen's compensation act 1923, Apprentices act 1961, Environmental protection act 1986

5. Project Report Preparation: Procedure of preparing a project report, Format of project report, Preparation of project report, Introduction to ISO: 9000 Series of Quality System

RELIABILITY, MAINTENANCE & SAFETY ENGINEERING*

Semester - VI	Sessional – 25 Marks
Stream– B.Voc (AM)	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Unit: 1. Reliability: Definition, reliability function, Mean failure rate, mean time to failure (MTTF), mean time between failures (MTBF), hazard rate curve. Bathtub curve, Conditional Reliability

Unit: 2. Constant Failure rate model: Exponential Reliability function, Failure Modes, CFR model, memory lessness, System reliability: Series, parallel, mixed & complex configuration; Reliability improvement.

Unit: 3. Design for reliability: Reliability specifications and system Measurements, System Effectiveness, redundancy, Classification of Redundancy. Introduction of failure mode and effect analysis (FMEA)

Unit: 4. Maintainability Analysis of Downtime, repair time distribution, stochastic point processes.

Unit: 5. Safety engineering: Fundamentals of industrial safety, Safety policy and safety terminology, Different types of safety systems and equipments, Safety targets, standards, objectives.

Reference Books: 1. Reliability Engineering, S.C. Sharma, Khanna Publishing House

PLANT LAYOUT & PRODUCT HANDLING*

Semester - VI	Sessional – 25 Marks
Stream– B.Voc (AM)	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course objectives:

1. To learn Objective of Facility Design.
2. To study Computerized handling of layout algorithms.
3. To study Product handling.

1. Objective of Facility Design: Types of layout problems, the layout function, organization of layout. Analysis and Design of Material Flow: Systems approach to flow cycle, process charts, flow process charts, Quantitative analysis of material flow; optimal material flow configuration. Space and Area Allocation for Production and Physical Plant Services.

2. Computerized handling of layout algorithms; Algorithms for computerized Layout Planning, Construction and Development type of computerized Layout Planning Techniques i.e. CRAFT, ALDEP, CORELAP etc.

3. Product handling; Design of system configurations conforming to various kinds of product features and layout characteristics; Design concepts of common handling and transfer equipment; Different types of conveyors, elevators, fork lifters;

4. Design concept of warehouse facilities commensurate with adopted kind of handling and transfer devices; Automated Handling of materials, Automated Transfer lines, AGVS, Use of Robots in Product handling, automated packaging devices.

5. Application of pneumatic and hydraulic system in transportation and handling of products, Design of integrated plant layout for product handling systems

CAD & CAM*

Semester - VI	Sessional – 25 Marks
Stream– B.Voc (M)	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course objectives:

1. To study about Introduction CIM and CAD & Analysis.
2. To study about Computer aided Manufacturing CAM.
3. To study about Part Programming NC part programming

1. Introduction CIM and CAD & Analysis: CIM: Introduction of CIM– concept of CIM - evolution of CIM – CIM wheel –Benefits – integrated CAD/CAM. CAD: Introduction– CAD definition – Shigley's design process – CAD activities – benefits of CAD. Types of CAD systems, CAD software packages, 2D & 3D transformations, Geometric modeling: Techniques: Wire frame modeling – surface modeling – solid modeling

2. Computer aided Manufacturing CAM: Definition, functions, benefits. Group technology – Part families - Parts classification and coding - coding structure – Optiz system, MICLASS system and CODE System - process planning – CAPP – Types of CAPP: Variant type, Generative type – advantages of CAPP – production planning and control – computer integrated production management system – Master Production Schedule (MPS) – Capacity planning – Materials Requirement Planning (MRP) –Manufacturing Resources Planning (MRP-II)

3. CNC Machine and Components:

CNC Machines: Numerical control – definition – components of NC systems – development of NC – DNC – Adaptive control systems – working principle of a CNC system – Features of CNC machines - advantage of CNC machines – difference between NC and CNC – Construction and working principle of turning centre – Construction and working principle of machining centers – machine axes conventions turning centre and machining centre – design considerations of NC machine tools.

4. Part Programming NC part programming – methods – manual programming – conversational programming – APT programming - Format: sequential and word address formats - sequence number – coordinate system – types of motion control: point-to-point, paraxial and contouring – Datum points: machine zero, work zero, tool zero NC dimensioning – reference points – tool material – tool inserts - tool offsets and compensation - NC dimensioning – preparatory functions and G codes, miscellaneous functions and M codes – interpolation: linear interpolation and circular interpolation.

5. FMS, Integrated Material Handling and Robot: Types of manufacturing - introduction to FMS – FMS components – FMS layouts – Types of FMS: flexible manufacturing cell – flexible turning cell – flexible transfer line – flexible machining systems – benefits of FMS - introduction to intelligent manufacturing system – virtual machining. Computer Integrated material handling – AGV: working principle – types, benefits – Automatic Storage and Retrieval Systems (ASRS).ROBOT – definition – robot configurations – basic robot motion – robot programming method – robotic sensors - industrial applications: characteristics, material transfer, machine loading, welding, spray coating, assembly and inspection.

PROJECT

Students needs to do a project in this semester.

WORKSHOP –VI

(Covering all the practicals of Supervisor Manufacturing (ASC/Q6306)

Semester -1st	Internal – 20 Marks
Stream– Manufacturing	External – 30 Marks
L T P Total Credits	Total: 50 Marks
0 0 18 18	Duration of Exam: 3 Hours

Course objective:

1. To understand the safety measures of mechanical workshop.
2. To learn the functions of various conventional machines and unconventional machines.
3. To prepare different jobs by different machining operation.
4. To learn about CNC machine.

Course contents:

1. Measure and mark reference points/ cutting lines on the work pieces, using compasses, callipers, rulers and other measuring tools
2. Understand the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions
3. Set of machine stops or guides as per the specified lengths indicated through scales or work instructions
4. Set-up, adjust machine tools, fixtures/ jigs and cutting tools in order to perform machining operations
5. Check the centering and facing of the work pieces and check for alignment of the work pieces as per the final product output specifications
6. Gain knowledge on gear changing techniques and minor maintenance as per checklist
7. Check the working of different holding fixtures, gears, stops.
8. Brush or spray lubricating material on work pieces where applicable
9. Operate hand wheels or valves in order to feed the component and allow cooling and lubricating to the tool.
10. To perform exercise on centre lathe such as facing, plain turning, step turning, chamfering and thread cutting operations.
11. To perform reaming, parting off and knurling operation by using lathe.
12. To perform the drilling and boring operations by using lathe machine.
13. To perform shaping operation of given mild steel rod.
14. To prepare a job by machining on milling machine.
15. To Prepare a 'V' block on a rectangular block on shaping machine.
16. To grind the single point cutting tool with the given nomenclature and measure angles using tool maker's microscope.
17. To perform exercise on shaping machine to obtain flat surfaces and key way.
18. To prepare a job by using planar, shaper and slotting machine.
19. To perform the operations such as drilling, counter boring and tapping using drilling machine.
20. To make a slot on the given work piece.
21. To prepare a job by surface grinding on surface grinder and perform dressing and balancing of wheels.
22. To study and use broaching machine in different applications.

23. To study a progressive tool and perform blanking and piercing.
24. To make rod/pipe bending using Hydraulic press (or) to perform Bending Operation.
25. Use files, hand grinders, wire brushes, or power tools for performing de burring operations.
26. Use chisels, scrapers, and other hand tools and equipment to Trim, scrape, or de burr objects or parts
27. Clean the hydraulic tank/ Gauge/ Tools/ Fixtures as per the cleaning schedule and the process mentioned in the Work Instruction/ SOP manual
28. Perform minor repairs and adjustments to the machine and notify supervisor/maintenance team when major service/ repair is required
29. Measure the specifications of the finished component and verify conformance as per Control Plan/ Work Instruction
30. Use devices like micrometers, vernier calipers, gauges, rulers and any other inspection equipment for measuring specifications with valid calibration status.
31. Note down the observations of the basic inspection process and identify pieces which comply with the specified standards
32. Organize changing different worn out machine accessories
33. Ensure that the blunt tool is timely and safely replaced by a new tool
34. Replace machine part as per work instructions, using hand tools or notify supervisor/ engineering personnel for taking corrective actions

Course Outcomes: After studying this course the students will be able to:

1. Understand the safety measures of mechanical workshop.
2. Perform the operations on various conventional machines and unconventional machines.
3. Prepare different jobs by different machining operation.
4. Learn about CNC machine.

Reference books:

1) A course in workshop technology: manufacturing processes by B.S. Raghuwanshi.
2) Textbook of workshop technology by R S Khurmi and J k gupta.
3) Workshop Technology Vol I & II –Hazra & Chaudhary, Asian Book Comp., New Delhi.

J.C. Bose University of Science & Technology, YMCA, Faridabad
(A Haryana State Government University)
(Established by Haryana State Legislative Act No. 21 of 2009 & Recognized by UGC Act 1956 u/s 22 to Confer Degrees)
Accredited 'A' Grade by NAAC

COMMUNITY COLLEGE OF SKILL DEVELOPMENT (CCSD)

ANNEXURE-1A

Program B.Voc Manufacturing (program Code: 252)
Revised Scheme Course Index of the year 2020-2021(BOS Dated 18/05/2020)
Mapping of the course with the employability/Entrepreneurship/Skill Development

S.NO	Course	Code	Skill development	Entrepreneurship	Employability
1	Communication Skills	BSC-101	✓	✓	
2	Engineering Calculations	BSC-102	✓	✓	
3	Engineering Science	PCC-AM-106	✓		✓
4	Manufacturing process-1	PCC-AM-101	✓		✓
5	Manufacturing Workshop-1	PCC-AM-103	✓	✓	✓
6	Employability Skills - 1	BSC-206	✓	✓	
7	Applied Science	PCC-AM-205	✓		✓
8	Quality, inspection and Safety	PCC-AM-202	✓		✓
9	Manufacturing process-2	PCC-AM-201	✓		✓
10	Manufacturing Workshop-2	PCC-AM-204	✓	✓	✓
11	Machining and Machine Tools		✓		✓
12	Material Science	PCC-AM-302	✓		✓
13	IT TOOLS	PCC-AM-306	✓		✓
14	Soft Skills	BSC-301	✓	✓	
15	Manufacturing Workshop-3	PCC-AM-305	✓	✓	✓
16	ON-JOB TRAINING	PCC-AM-401	✓	✓	✓
17	ON-JOB TRAINING	PCC-AM-501	✓	✓	✓
18	Quality Control Techniques	PCC-M-604	✓		✓
19	Industrial Management	PCC-AM-603	✓		✓
20	Entrepreneurship	BSC-601	✓		✓
21	Project	BSC-602	✓	✓	
22	Manufacturing Workshop-4	PCC-M-606	✓	✓	✓
23	Reliability, Maintenance & Safety Engineering*	PCC-M-605	✓		✓
24	Plant Layout & Product Handling*	PCC-M-607	✓		✓
25	CAD & CAM*	PCC-M-608	✓		✓

Principal, CCSD

SCHEME OF EXAMINATION

And

SYLLABUS

for

BACHELOR OF VOCATION (B. Voc.)

in

ELECTRICAL

Offered by

Community College of Skill Development

J C Bose University of Science & Technology,

YMCA Sector-6, Mathura Road, Faridabad,

Haryana, India

ABOUT THE COMMUNITY COLLEGE OF SKILL DEVELOPMENT

Community College of Skill Development has been running Diploma in Electrical Electrician since 2013 and also got approval from UGC for B. Voc. in Electrical Electrician in 2018 with a mission to impart quality education along with extensive hands-on training on the equipment/systems in electrical laboratories and industries. At present CCSD offers skill programs in Electrical domain. The training is based on the Dual Education System, which lays great emphasis on practical training. The curriculum also provides an excellent "feeder" degree for those students uncertain about choosing a specific career. The presence of highly skilled and qualified trainer helps the students to enhance their professional and skill levels.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO-1: To produce competent B. Voc. Electrical graduates with a strong foundation in Construction, Installation, maintenance and process in electrical system.

PEO-2: To encourage the B. Voc. Electrical graduates to practice the profession following ethical codes, social responsibility and accountability.

PEO- 3: To train students to communicate effectively in multidisciplinary environment.

PEO- 4: To imbibe an attitude in the graduates for life-long learning process.

PROGRAM OUTCOMES

After completing the program, students will be able to

1. Develop experimentation skills and understand importance of measurement practices in Science & Technology.
2. Practice safely in all electrical works. Provide First Aid against electrical hazards.
3. Handle Charging & maintenance of Batteries. Checking specific gravity, voltage etc.
4. Prepare different types of documentation as per industrial need by different methods of recording information.
5. Apply ethical principles and commit to professional ethics and responsibilities and norms of the technical practice.

PROGRAM SPECIFIC OUTCOMES (PSOs)

To impart State-of-Art knowledge in the field of Electrical and hand on application based practical training with regular Academic and Industry interaction.

SCHEME OF EXAMINATION

YEAR	FIRST SEMESTER			SECOND SEMESTER		
I	**Course**	**Code**	**Credits**	**Course**	**Code**	**Credits**
	Electrical Machine - I	PCC-EL 101	3	Electrical Machine - II	PCC-EL 201	3
	Electrical Technology	PCC-EL 105	3	Electrical Wiring	PCC-EL-202	3
	Communication skills	BSC- 101	3	Electrical Vehicle	PCC-EL-205	3
	Engineering calculations - I	BSC-102	3	Engineering Calculations - II	BSC-202	3
	Electrical workshop - I	PCC-EL 107	18	Electrical workshop - II	PCC-EL-206	18
	Total		30	Total		30
	Cumulative credits = 30 (Certificate)			**Cumulative credits = 60 (Diploma)**		
Qualification Pack Code: CON/Q0603 NSQF LEVEL-4 JOB ROLE – ELECTRICIAN						
YEAR	**THIRD SEMESTER**			**FOURTH SEMESTER**		
II	**Course**	**Code**	**Credits**	**Course**	**Code**	**Credits**
	Industrial Electronics and control of drives - I	PCC-EL 307	3	On Job Training (OJT)/ Internship evaluation including report and presentation	PCC-EL 401	30
	Electrical Machine - III	PCC-EL 305	3			
	Power System	PCC-EL 306	3			
	Soft Skills	BSC-302	3			
	PLC Workshop	PCC-EL 304	18			
	Total		30	Total		30
	Cumulative credits = 120 (Advance Diploma)					
Qualification Pack Code: CON/Q0604 NSQF LEVEL-5 JOB ROLE – FOREMAN						
YEAR	**THIRD SEMESTER**			**FOURTH SEMESTER**		
III	**Course**	**Code**	**Credits**	**Course**	**Code**	**Credits**
	On Job Training (OJT)/ Internship evaluation including report and presentation	PCC-EL 501	30	Entrepreneurship	BSC-601	3
				Industrial Electronics and control of drives - II	PCC-EL 601	3
				Fundamentals of Electromagnetism	PCC-EL 602	3
				Installation and Maintenance of Equip.	PCC-EL 602	3
				Modern Electric Traction System	PCC-EL 602	3
				Minor project	BSC-603	9
				Electrical workshop - III	PCC-EL-603	12
	Total		30	Total		30
	Cumulative credits = 180 (B. Voc. Degree)					
Qualification Pack Code: CON/Q0605 NSQF LEVEL- 6 JOB ROLE – SUPERVISOR						

DETAILED SYLLABUS
SEMESTER – 1st SCHEME

Paper Code	Course	L	T/P	Credits
PCC-EL-101	Electrical Machine - I	3	0	3
PCC-EL-105	Electrical Technology	3	0	3
BSC- 101	Communication Skills	3	0	3
BSC-102	Engineering Calculations - I	3	0	3
PCC-EL -107	Electrical workshop - I	0	18	18

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
Electrical Machine - I
Paper Code- PCC-EL-101

Semester 1st	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To learn the concept of electrical machines.
2. To know the different types of DC machine.
3. To learn the basics of Single phase and three transformers.
4. To understand the applications of electrical machines.

Course Contents

Unit-1 Introduction to Electrical Machines: Definition of motor and generator, Generalized Model of an Electric Machine, Torque development due to alignment of two fields, Electro- magnetically induced emf, Elementary concept of an electrical machine, Comparison of generator and motor

Unit-2 DC Machines: Construction of a DC Machine: Armature and Commutator, Types of DC Machine, Emf Equation Significance of Back Emf, Torque Developed, DC Motor Characteristics, Speed control of DC Motor, Starters of DC Motor, Application of DC Motor, Faults in DC Machines.

Unit 3: Single Phase Transformer: Working principle and Constructional features of a transformer and parts of transformer, Practical Transformer on No-Load, Equivalent Circuit Diagram of a Transformer, Losses in Transformer, Transformer Tests, Auto- transformer, Working of Auto-Transformer, Saving of Copper, Types of Transformers.

Unit 4: Three Phase Transformer: Construction of three phase transformer and accessories of transformers such as Conservator, breather, Buchholtz Relay, Tap Changer (off load and on load) (Brief idea) Three phase transformer Connection i.e. delta-delta, delta-star, star-delta and star-star , Star delta connections (relationship between phase and line voltage, phase and line current) Conditions for parallel operation of 3 phase Transformer, Cooling of Transformers, Difference between Power and Distribution Transformers.

Key learning Outcomes:

1. Students learn about the basics of electrical circuits.
2. Students have the knowledge of concept of DC electrical machines.
3. Students have learnt the basics of transformer and their different types.
4. Students understand about the various types of tests in transformer.

Text/Reference books:

1. “Basics of Electrical Engineering” by K.UMA RAO.
2. “Electric Machines” by Ashfaq Husain.
3. “Basic of Electrical Engineering” by D.P. Kothari and I.J. Nagrath.
4. “Fundamentals of Electrical Engineering” by Sahdev, Uneek Publication, Jalandhar

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
ELECTRICAL TECHNOLOGY
Paper Code- PCC-EL-105

Semester 1st	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives

1. To learn about basics of Electrical.
2. To learn about different types of Theorems.

Course Contents

Unit-1. Introduction: Current Electricity Definition of Resistance, Voltage, Current, Power, Energy and their units, Relation between electrical, mechanical and thermal units, Temperature variation of resistance, Difference between AC and DC voltage and current.

UNIT-2. D.C. Circuits: Ohm's Law, Series – parallel resistance circuits, calculation of equivalent resistance, Kirchhoff's Laws and their applications.

UNIT-3. Electric Cells: Primary cell, wet cell, dry cell, battery, Li-ion battery, series and parallel connections of cells, Electronics Manufacturing Services, Secondary cells, Lead Acid Cell, Discharging and recharging of cells, preparation of electrolyte, care and maintenance of secondary cells.

UNIT-4. Lighting Effects of Current: Lighting effect of electric current, filaments used in lamps, and Tube light, LED, their working and applications, Capacitors: Capacitor and its capacity, Concept of charging and discharging of capacitors, Types of Capacitors and their use in circuits, Series and parallel connection of capacitors, Energy stored in a capacitor.

Key learning Outcomes:

After undergoing the subject, the students will be able:

- To Understand about the circuits.
- To differentiate the functioning of different cells.
- To Check the batteries.

Reference Books:

1. Basic Electrical Engineering, Ritu Sahdev, Khanna Publishing House
2. Basic Electrical Engineering, Pradeep Kumar, Khanna Publishing House

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
COMMUNICATION SKILLS
Paper Code: BSC- 101

Semester 1st	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To discuss types of communication and their forms
2. To improve comprehension
3. To improve spoken English and ability to articulate ideas
4. To improve formal writing skills

Course Contents

Unit 1: Introduction to Communication: Meaning, Importance and Function of Communication, Types of communication, language of communication; advantages and disadvantages; Barriers to Communication; Organizational Communication

Unit 2: Grammar: Parts of speech, Articles, Tenses, Formation of Sentences, Active and Passive Voice, Direct and Indirect speech

Unit 3: Writing and Comprehension: Comprehension, Composition, Translation, Paraphrasing, Letter writing

Unit 4: 7 Cs of Communication Grice's Cooperative Principle; Group Discussions; Public Speaking; Facing Interviews

Key learning Outcomes:

1. To learn about communication process and ways to make communication effective by giving attention to all elements involved.
2. To improve grammar and gain confidence by enhancing their abilities to articulate their ideas.
3. To acquire better writing skills in formal communication.
4. To be able to revise documents for fruitful reading and comprehension.

Reference books:

1. Wren and Martin. *High School English Grammar and Composition.* New Delhi: RRP, 2007
2. Murphy, Raymond. *Essential English Grammar*. New Delhi: Cambridge, 2017

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
ENGINEERING CALCULATIONS-I
Paper Code:BSC-102

Semester 1st	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives

1. To familiarize the prospective engineers with Basics of mathematics
2. To understand fundamental arithmetical operations.
3. To learn Unit systems, Fractions and Decimals, roots, percentage.
4. To have Knowledge of differential quantities.

Course Contents

Unit-I: Trigonometry – Introduction, Trigonometric Identities, Quadrant Rule, Trigonometric Ratios of Some Specific Angles, Ratios of Complementary Angles, Introduction

Unit-II: Differentiation- Introduction to Derivatives, Product Rule, Quotient Rule, Chain Rule, Derivatives of Algebraic Function, Derivative of Trigonometric Functions.

Unit –III: Integration: concepts of integration, integration of trigonometric, exponential and logarithmic functions, integration by parts.

Unit-IV: Algebra- Algebraic Expressions and Identities, Terms Coefficients and Factors, Monomials Binomials and Polynomials, Multiplication and Division of Algebraic Expressions, Standard Identities and Their Applications. Fundamental Arithmetical Operation- Addition, Subtraction, Multiplication and Division. Applied Workshop Problems Involving Addition, Subtraction, Multiplication and Division, System Of Units – Definition, Different Types & System Of Units i.e., (C.G.S. & SI Units for Length, Mass, Area, Volume, Capacity, Time) HCF, LCM, Square Root Cube Root.

Key learning Outcomes:

1. To Apply the Arithmetical Operations and Conversion of Units.
2. To Convert in Fraction and Decimals, Percentage.
3. To Solve HCF, LCM, Square Roots and Cube Roots.
4. To Deal with Differential Problems.
5. To Learn About Trigonometric Ratios.

Reference Books:

1. Mathematics Book by R.D Sharma
2. Advanced Engineering Mathematics by Jain Rk.
3. A Basic Course in Mathematics by Nabjyoti Dutta.

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
Electrical Workshop
Paper Code- PCC-EL-107

Semester- 1st	Internal: 30 Marks
Stream–Electrical	External: 20 Marks
L T P Total Credits	Total: 50 Marks
3 0 0 18	Duration of Exam: 3 Hours

Course Objectives:

1. To understand the safety measures in electrical.
2. To know the different equipment's used in electrical workshop and their use, care & maintenance.
3. To understand about the various joints and soldering joints.
4. To have knowledge of electrical connections, meters and instruments.
5. To obtain practical skills of basic operation and working of tools used in the workshop.

Course Contents

1. Implementation in the shop floor of the various safety measures. Visit to the different sections of the Institute Demonstration on elementary first aid. Artificial Respiration.
2. Demonstration of Trade hand tools. Identification of simple types- screws, nuts & bolts, chassis, clamps, rivets etc. Use, care & maintenance of various hand tools.
3. Practice in using cutting pliers, screw drivers etc. skinning the cables, and joint practice on single strand. Demonstration & Practice on bare conductor's joints-such as Britannia, straight, Tee, Western union. Joints.
4. Practice in soldering- Measurement of Resistance and Measurement of specific Resistance. Application of Wheatstone bridge in measurement of Resistance.
5. Demonstration and identification of types of cables. Demonstration & practice on using standard wire gauge. Practice on crimping thimbles, Lugs. Examination and checking of cables and conductors and verification of materials according to the span.
6. Verification of Ohm's Law, Verification of Kirchhoff's Laws. Verification of laws of series and parallel circuits. Verification of open circuit and closed-circuit network. Measuring unknown resistance using Wheatstone bridge.
7. Practice on installation and overhauling common electrical accessories. Fixing of switches, holder plugs etc. in T.W. boards. -Identification and use of wiring accessories concept of switching.
8. Assembly of a Dry cell- Electrodes-Electrolytes. Grouping of Dry cells for a specified voltage and current, Ni cadmium & Lithium cell. Practice on Battery Charging, Preparation of battery charging, testing of cells, Installation of batteries, Charging of batteries by different methods. Practice on Electroplating and anodizing, Cathodic protection.
9. Routine care & maintenance of Batteries.
10. Charging of a Lead acid cell, filling of electrolytes- Testing of charging checking of discharged and fully charged battery.
11. Measurement of resistance by different methods- a) Using Wheatstone Bridge b) By voltage drop method. Experiment to demonstrate the variation of resistance of a metal with the change of temperature. -Measure of 'R' by drop method. -Series & shunt ckts-use of Multimeters
12. Connection of Calling Bell, Buzzer, Alarms, Electric Iron, Heater, Light. Rewinding /assembly of different electrical appliances. Study, maintenance and repair of domestic equipment's – Electric Kettle, Heater / Immersion Heater Hot Plate, Geyser, Washing machine cooking range, Incubators, Furnaces, Pump set. Etc.

13. Identification and study of the parts of a D.C. machine. Practicing dismantling and assembling in D.C. Machine.
14. Connection of shunts Generators, Measurement of voltages-Demonstration on field excitation. Connection of compound Generator-Voltage measurement-cumulative and differential – No Load & Load characteristics of Series, Shunt & Compound Generator. Controlling and protecting DC Generator.

Key learning Outcomes:

1. Students have knowledge of caring and maintenance of different tools used in workshop.
2. Students have the practice of soldering the joints.
3. Students have practical experience of electrical connections of measuring instruments.
4. Student understand about the different types of batteries and their maintenance.
5. Students have experienced practicing the dismantling and assembling of DC machine.

Text/Reference books:

1. "Electrician" by National Instructional Media Institute, Chennai
2. "Electrical Workshop: Safety, Commissioning, Maintenance & Testing of Electrical Equipment" by R.P. Singh.

SEMESTER – 2nd SCHEME

Paper Code	Course	L	T/P	Credits
PCC-EL-201	Electrical Machine - II	3	0	3
PCC-EL-202	Electrical Wiring	3	0	3
PCC-EL-205	Electrical Vehicle	3	0	3
BSC-202	Engineering Calculations - II	3	0	3
PCC-EL-206	Electrical workshop - II	0	18	18

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
ELECTRICAL MACHINE-II
Paper Code - PCC-EL-201

Semester 2nd	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To discuss types of communication and their forms.
2. To improve comprehension.
3. To improve spoken English and ability to articulate ideas
4. To improve formal writing skills

Course Contents

Unit I: Electrical Panels: Working principle and components of electrical panels, transformers and generators, operational characteristics of electrical panels and power distribution through the same advance troubleshooting in electrical panels, transformers and generators

Unit II: Electric Motors: Working principle and connection of AC single phase and AC three phase motors, submersible pumps and their maintenance selection and use of starters such as DOL, Star Delta, Step down Transformer starter etc.

Unit III: Electrical Circuits: Concepts of electrical circuits which includes properties and functions of RCL circuits, inductive DC, AC circuits, details of capacitors, inductors and their actions in DC, AC circuits. Type of connections and tests to be carried out in capacitive, inductive AC and DC circuits, Advantages of three phase supply over single phase line and phase voltage, current and power in a 3 phase circuits with balanced and unbalanced.

Unit IV: Heavy Machineries: Detailed concept of electrical installation sequence of electrical panels, transformers, DGs, cables, cranes and electrification of Machineries, Method of erection of an electrical panel and Tower Crane.

Key Learning Outcomes:

1. Understands the concept of operation of machines
2. Learns basics of electrical circuits
3. Have knowledge of basic electrical terms

Reference books:

1. Basics of Electrical Engineering by K.UMA RAO.
2. Electric Machines by Ashfaq Husain.
3. Engineering Thermodynamics by PK Nag; Tata McGraw Hill, Delhi.
4. Basic Engineering Thermodynamics by Roy Chaudhary; Tata McGraw Hill, Delhi.
5. Fundamentals of Electrical Engineering by Sahdev, Uneek Publication, Jalandhar.

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
Electrical Wiring
Paper Code-PCC-EL-202

Semester 2nd	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To gain knowledge of basic electrical wiring
2. To have knowledge of basic electrical wiring symbols
3. To learn about various connections and their applications.

Course Contents

Unit I: Introduction: Scope of the National Electrical Code, Graphical symbols for diagrams, letters symbols and signs, Guide for preparation of diagrams.

Unit II: Domestic and Industrial Wiring: Meggar, Selection of the wiring system, Material Required for Wiring, Preparation for wiring, Methods of wiring, Domestic Wiring Methods, Advantages, Disadvantages, Uses and Precautions Regarding various Domestic wirings, I. E. or I.S. Rules Regarding wiring, Tests for wiring as per I.E. Rules before supplying mains, General faults of Electrical Installations, Wattage of Lamp for various Uses, Location of Lamp points,

Unit III: Cutting tools and Fasteners: Drilling, Hand taps, Gauges, limit gauges and fixed gauges, different types of threads, Fasteners, Riveting, riveting by hand, Shapes of rivet Heads, Riveted Joints, Spacing of Rivets, Hand Drilling Machines.

Unit IV: Electrical Accessories: Electrical Accessories and their Uses, Switches and their types, Lamp holders and their types, Ceiling Rose, Pin Plug, Socket and Adopter, Fuse outlets and their types, Precautions for using Electrical Cables, Measurement of wires, Measurement of Cables, Types of wires, Types of Cables, Fire Alarm.

Key learning Outcomes:

1. Have knowledge of electrical wiring instruments.
2. Learns lines and symbols of wiring.
3. Learns freehand wiring diagram.
4. Understands projections of drawing.

Text/Reference books:

1. Frederic P. Hartwell and H. P Richter; Practical Electrical Wiring: Residential, Farm, Commercial, and Industrial, Park Publishing, 2014.
2. Electrical Wiring Commercial, 17E Ry C. Mullin, Phil Simmons NEC 2020.
3. Rex Cauldwell; Wiring a House, Published by The Taunton Press, 2002.

J. C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
Electrical Vehicle
Paper Code-PCC-EL-205

Semester 2nd	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives

1. To familiarize students with basic of power derived vehicles.
2. To understand the configuration and working of a vehicle.
3. To have a knowledge of designing of an Electric Vehicle.

Course Contents

Unit I: Introduction of Electric Vehicles: Electric vehicle Architecture: Major components of electric vehicle, Hybrid Electric vehicles, In-vehicle Safety devices and usage of safety devices. Mandatory Safety precautions while handling Electric Vehicle. Safety measure to be taken before & while driving an electric vehicle. Instrument Cluster: Different Symbols/Icons Meaning and functions, Various gauges and meters reading Different pages of cluster display & diagnostic page

Unit II: Battery: Fundamentals of batteries, different Types of batteries dry batteries, zinc chloride, lead acid and lithium-Ion batteries construction and working. Battery, Tools for checking the battery, Capacity in AH & KWH, Battery Charging, Safety Applications of battery, **Li-Ion Battery:** HV Battery pack detailed explanation of Lithium-Ion battery, in vehicle Removal and reinstallation of battery Safety precautions for handling a high voltage battery, Battery connections Battery management system, Battery cooling system

Unit III: Introduction of HV components in electric vehicle: Traction motors: DC and AC motors, Traction controller, Traction batteries, Traction cooling system, EV charging, precautions while working on High voltage.

Unit IV: EV Charging System: Electric Vehicle Charger: Main components of EV Charger, EV Charging Sockets, Charging of Electric Vehicle, EV charging system and its classification, Basic Charging system faults and rectification, safety precautions for EV charging.

Key Learning Outcomes:

1. Students will learn about Electrical Vehicles.
2. Students will be updated about latest technology.
3. Understands the design of an Electric vehicle.

Reference Books:

1. Iqbal Husain; Electric and Hybrid Vehicles: Design Fundamentals, Third Edition, CRC Press, 2021.
2. Ali Emadi, Mehrdad Ehsani and John M. Miller; Vehicular Electric Power Systems: Land, Sea, Air and Space Vehicles, First Edition, Marcel Dekker, 2004.

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
Engineering Calculations-II
Paper Codes: BSC-202

Semester 2nd	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives

1. To familiarize the prospective graduates with Basics of mathematics. 2. To understand fundamental arithmetical operations.
3. To learn Unit systems, Fractions and Decimals, roots, percentage.
4. To have Knowledge of ratio and proportion, factorization and mensuration.

Course Contents

Unit-I Complex number: Definition of Complex Number, Operations on Complex Number (Add., Sub., Multiplication, Division), Conjugate Complex Number, Modulus and Amplitude of a Complex Number, Polar form of a Complex Number.

Unit -II Matrices and Determinants: Definition and Properties of Determinants, Definition and Types of Matrixes, Transpose of a Matrix, Symmetric, Skew Symmetric Matrices, Orthogonal matrices, Hermitian and Skew Hermitian, Minors and Cofactors, Adjoint and Inverse of a Matrix, Cramer's Rule, Solution of Simultaneous Linear Equations by Inverse Matrix Method, Characteristic Matrix, Characteristic Equation, Eigen Values & Vectors, Cayley Hamilton Theorem (verification only).

Unit -III Differentiation: Introduction to Derivatives, Product Rule, Quotient Rule, Chain Rule, Derivatives of Algebraic Function, Derivative of Trigonometric Functions, partial derivative.

Unit - IV Integration: Concepts of integration, integration of trigonometric, exponential and logarithmic functions, integration by parts.

Key learning Outcomes:

1. Students will learn about complex number.
2. Students will learn about matrix and determinants.
3. Students will able to deal with derivative Problems.
4. Students will able to solve and learn integration.

Reference Books:

1. Mathematics Book by R.D Sharma
2. Advanced Engineering Mathematics By Jain Rk.
3. A Basic Course in Mathematics By Nabjyoti Dutta.

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT

Electrical Workshop II

Paper Code- PCC-EL- 206

Semester- 2nd	Internal: 30 Marks
Stream–Electrical	External: 20 Marks
L T P Total Credits	Total: 50 Marks
3 0 0 18	Duration of Exam: 3 Hours

Course Objectives:

1. To have knowledge of electrical symbols and wiring Circuit.
2. To understand about the verification of electrical laws which have studied earlier.
3. To grasp the detailed explanation of concept of DC and AC machines.
4. To understand the concept of safety in machines.
5. To have knowledge of electrical connections, meters and instruments.

Course Contents:

1. Load test on dc shunt motor to draw speed – torque and horse power – efficiency characteristics.
2. Field test on dc series machines.
3. Speed control of dc shunt motor by armature and field control.
4. Swinburne's test on dc motor.
5. Retardation test on dc shunt motor.
6. Regenerative test on dc shunt machines.
7. Load test on single phase induction motor.
8. No load test on three phase induction motor and determination of performance parameters at different load conditions.
9. Blocked rotor test on three phase induction motor.
10. Conduct an experiment to draw V and Λ curves of synchronous motor at no load and load conditions.
11. To join electrical cables using standard cable joining methods.
12. Test underground cable for faults and remove the faults.
13. Determine the number of solar cells in series / parallel for given power requirement.
14. Practice installation of conduits, race ways, switch boards, distribution boards, lights, fans and lighting fixtures.
15. Practice cable laying through conduits.

Key Learning Outcomes:

1. Students have learnt about the validation of electrical laws.
2. Students have knowledge of electrical connection in DC and AC machines.
3. Students have experienced about wiring and installations.
4. Student understand about the electrical cables and faults involved in it.
5. Students have learnt about the concept of solar PV panels and connection the solar PV cells in series and parallel groups to charge the battery for a given power requirement.

SEMESTER – 3rd SCHEME

Paper Code	Course	L	T/P	Credits
PCC-EL-307	Industrial Electronics and control of drives - I	3	0	3
PCC-EL-305	Electrical Machine - III	3	0	3
PCC- EL 306	Power System	3	0	3
BSC-302	Soft Skills	3	0	3
PCC-EL-304	PLC Workshop	0	18	18

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
INDUSTRIAL ELECTRONICS AND CONTROL OF DRIVES-I
PCC- EL-307

Semester 3rd	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To have Basic knowledge of Control of basic Industrial electronic devices.
2. To familiarize with the Industrial electronic devices.
3. To study Power conversion techniques.

Course Contents

Unit I: Electrical Drives: Shaft Drive Types of Power Modulators, Comparison between A.C. and D.C. Drives, Drive operation, Advantages and Disadvantages of D.C. Drive, Variable Voltage Variable Frequency Drive (VVVFD), Applications of A.C. Drives.

Unit II: Introduction to SCR: Construction and working principles of an SCR, two transistor analogy and characteristics of SCR, SCR specifications and rating, Construction, working principles and V-I characteristics of DIAC, TRIAC and Quadriac, Basic idea about the selection of heat sinks for SCR and TRIACS, Methods of triggering a Thyristor. Study of triggering circuits, UJT, its Construction, working principles and V-I characteristics, UJT relaxation oscillator, Commutation of Thyristors, Series and parallel operation of Thyristors, Applications of SCR, TRIACS and Quadriac such as light intensity control, speed control of DC and universal motor, fan regulator, battery charger etc., dv/dt and di/dt protection of SCR.

Unit III: Uninterrupted power supplies: UPS online, off-line, Storage devices (batteries), SMPS, CVT.

Unit IV: Inverters, Choppers, Dual Converters and Cyclo-Convertors: Inverter introduction, working principles, voltage and current driven series and parallel inverters and applications; Choppers-introduction, types of choppers and their working principles and applications; Dual converters-introduction, working principles and applications 4.4 Cyclo-converters- introduction, types, working principles and applications.

Key Learning Outcomes:

1. Understands the concept of various semiconductor devices.
2. Have knowledge of basic conversion devices.
3. Have knowledge of SCR, UPS, Inverter, Choppers, Dual Converters and Cyclo-Convertors.

Text/Reference books:

1. "Industrial Electronics and Control by Biswanath Paul; PHI Learning Private Limited, Delhi, 2014.
2. Industrial Electronics and Control by SK Bhattacharya and S Chatterjee; Tata McGrawHill Publishing Company Limited, New Delhi.
3. Power Electronics handbook devices, circuits, and applications by Muhammad H. Rashid; Butterworth-Heinemann publications.

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT

Electrical Machines –III

Paper Code-PCC-EL-305

Semester 3rd	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To learn safety measures from Electrical hazards.
2. To have Basic knowledge of Electrical Instruments.
3. To familiarize with the Electrical Machines.

Course Contents

Unit I: Synchronous Machines: Main constructional features of commutator and brushless excitation system, Generation of three phase emf, Production of rotating magnetic field in a three-phase winding, Concept of distribution factor and coil span factor and emf equation Armature reaction on unity, lag and lead power factor, Operation of single synchronous machine independently supplying a load - Voltage regulation by synch-impedance method, Need and necessary conditions of parallel operation of alternators Synchronizing an alternator (Synchroscope method) with the bus bars, Operation of synchronous machine as a motor –its starting methods, Effect of change in excitation of a synchronous motor, Cause of hunting and prevention, Rating and cooling of synchronous machines, Applications of synchronous machines (as an alternator, as a synchronous condenser).

Unit 2: Induction Motors: Salient constructional features of squirrel cage and slip ring 3-phase induction motors, Principle of operation, slip and its significance and connection of submersible motor (Monoblock), Locking of rotor and stator fields, Rotor resistance, inductance, emf and current, Relationship between copper loss and the motor slip, Power flow diagram of an induction motor, Factors determining the torque, Torque-slip curve, stable and unstable zones, Effect of rotor resistance upon the torque slip relationship, Double cage rotor motor and its applications, Starting of 3-phase induction motors, DOL, star-delta, auto transformer, Causes of low power factor of induction motors, Testing of 3-phase motor on no load rotor test and find efficiency, Speed control of induction motor, conventional and thyristor.

Unit 3: Special Purpose Machines: Construction and working principle of linear induction motor, stepper motor, Schrage motor, DC Generator.

Unit 4: DC Generator: Basic structure of DC Machine, Construction and Magnetic circuit of DC Machine , Lap and Wave winding , Commutation , Methods of Improving Commutation , Characteristics of DC Generators.

Key learning Outcomes:

1. Students learn about the basics of electrical circuits.
2. Students have the knowledge of concept of DC electrical machines.
3. Students have learnt the basics of transformer and their different types.
4. Students understand about the various types of tests in transformer.

Text/Reference books:

1. "Basics of Electrical Engineering" by K.UMA RAO.
2. "Electric Machines" by Ashfaq Husain.
3. "Basic of Electrical Engineering" by D.P. Kothari and I.J. Nagrath.
4. "Fundamentals of Electrical Engineering" by Sahdev, Uneek Publication, Jalandhar

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
POWER SYSTEM
PCC- EL-306

Semester 3rd
Stream– Electrical
L T P Total Credits
3 0 0 3

Sessional – 25 Marks
Theory – 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. To learn about basic concept of Safety
2. To learn how to reduce workplace hazards.
3. To provide knowledge on various safety devices.
4. To learn safety measures during industrial as well as environmental hazards.

Course Contents

Unit-I: Generation of Electrical Energy: Conventional and Non-Conventional Methods of Power Generation, Sources of Energy, Generating Stations Hydro Electric Power Station, Schematic Arrangement of Hydroelectric Power station, Selection of slits for Hydroelectric

Unit II: Power Plants: Power Plant, Constituent of Hydroelectric Power Plant, Classification of Hydroelectric Power Plant, Nuclear Power Station, Selection of site for Nuclear Power Station, Merits and Demerits of Nuclear Power Plants, Power rating Nuclear Power Plant Reactor, on-Conventional Methods of Power Generation, Magneto Hydro Dynamic(MHD) Power Generation, Solar Power Generation, Solar Collectors, Solar Furnace, Solar Cell, Wind Energy, Geothermal Energy, Biomass Energy, Tidal Power Generation.

Unit III: Transmission and Distribution: Transmission, Relative Merits and Demerits of Various Transmission Systems, Distribution, Sub-station, Circuit Breakers, Advantages and Disadvantages of Overhead Line, Types of Overhead Lines, Materials used in Overhead Lines, Overhead Lines, Guarding, Indian Electricity Rules, Regarding Overhead Line, Under-ground Cables, Classification of Under-ground Cables, Construction of Under-ground Cable, Types of Underground Cables, Installation of Underground Cable, Faults in Underground Cable, XLPE Cables, Characteristics and advantages of XLPE, Useful Tables.

Unit-IV: Losses in Transmission: Corona, Reason of Corona Formation, Factors Responsible for Corona, How to Reduce the Corona Effect.

Key Learning Outcomes:

1. To Illustrate and Familiarize the students with the concept of generation, transmission and distribution of power.
2. Students should able to draw and read single line diagram of power system.
3. Students should able to know about protection, maintenance and installations of power system.

Text/Reference books:

1. “Modern Power System Analysis” Third Edition by D. P. Kothari and I. J. Nagrath.
2. “Power System Engineering” Second Edition by D. P. Kothari and I. J. Nagrath.
3. “Electrical Power Systems” First Edition by C. L. Wadhwa.

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
Soft Skills
Paper Code: BSC-302

Semester 3rd	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To help the students in building interpersonal skills.
2. To develop skill to communicate clearly.
3. To enhance team building and time management skills.
4. To learn active listening and responding skills.

UNIT 1: Grammar and Vocabulary

1.Tenses, 2. Subject–verb agreement. 3. Sentence Analysis: Simple, Compound and Complex sentences. 4. Phrases: Adjective, Adverb and Noun Phrase, 5. Clauses: Adjective, Adverb and Noun Phrase. 6. Voice, Narration, Gerund, Participle.

UNIT 2: Oral Communication

1. Listening Skill – Active listening, Barriers to active listening. 2. Speaking Skill-Stress patterns in English, 3. Questioning skills, 4. Barriers in Speaking 5. Reading Skill-Skimming, Scanning, Intensive reading, 6. linking devices in a text, 7. Different versions of a story/ incident.

UNIT 3: Writing Skills

Letter writing, Business letters • Application letters • Covering letters • Report writing o Academic report • Business report • Technical report • Technical project report • Job Application and Resume writing

UNIT- IV: Soft Skills

1.Body Language– Gesture, posture, facial expression. 2. Group Discussion– Giving up of PREP, REP Technique. 3. Presentation Skills: a. (i) How to make power point presentation b. (ii) Body language during presentation 4. Resume writing: Cover letter, career objective, Resume writing (tailor made) 5. Interview Skills: Stress Management, Answering skills.

UNIT- 5: Stress and Time Management

Introduction • Stress in Today's Time • Identifying the Stress Source • Signs of Stress • Ways To Cope With Stress • Healthier Ways To Deal With Stress • Time Management • Prioritize Your Work • Smart Work • Four Ds Of Decision Taking.

Key learning Outcomes

1. Self-Awareness, Personal Development and Life skills.
2. Leadership and communication
3. Social Justice and Responsibility

Reference Books:

1. Advanced English Usage: Quirk & Greenbaum; Pearson Education.
2. Developing Communication Skills: Banerjee Meera & Mohan Krishna; Macmillan Publications, 1990.

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
PLC Workshop
Paper Code-PCC-EL-304

Semester- 2nd	Internal: 30 Marks
Stream–Electrical	External: 20 Marks
L T P Total Credits	Total: 50 Marks
3 0 0 18	Duration of Exam: 3 Hours

Course Objectives:

1. To learn safety measures from Electrical hazards.
2. To have Basic knowledge of PLC automation.
3. To learn about PLC programming.

Course Contents

1. Delta PLC
2. Siemens PLC
3. Allen Bradley PLC programming
4. Wonderware SCADA.

SEMESTER – 4th SCHEME

Paper Code	Course	Teaching Schedule	Examination Schedule (Marks)		Total Marks	Credits
PCC-EL-401	On-Job Training	8 hours per day for one semester	200	300	500	30

Procedure for Annual Examination and Continuous Assessment

(A) Annual Exam Marks

1. Project Evaluation: 50 marks
2. Project Seminar: 50 marks
3. Project Viva: 100 marks

(B) Continuous Assessment Marks

1. Assessment by Institute faculty: 100 marks
2. Assessment by Industrial Guide: 100 marks
3. Conduct Marks: 50 marks

Total 500 Marks

SEMESTER – 5th SCHEME

Paper Code	Course	Teaching Schedule	Examination Schedule (Marks)		Total Marks	Credits
PCC-EL-501	On-Job Training	8 hours per day for one semester	200	300	500	30

Procedure for Annual Examination and Continuous Assessment

(A) Annual Exam Marks

4. Project Evaluation: 50 marks
5. Project Seminar: 50 marks
6. Project Viva: 100 marks

(B) Continuous Assessment Marks

4. Assessment by Institute faculty: 100 marks
5. Assessment by Industrial Guide: 100 marks
6. Conduct Marks: 50 marks

Total 500 Marks

SEMESTER – 6th SCHEME

Paper Code	Course	L	T/P	Credits
BSC-601	Entrepreneurship	3	0	3
PCC-EL-601	Industrial Electronics and control of drives - II	3	0	3
BSC-603	Minor project	0	9	39
PCC-EL-603	Electrical workshop - III	0	12	12
Elective Course				
Paper Code	**Course**	**L**	**T/P**	**Credits**
PCC-EL-602	Fundamentals of Electromagnetism	3	0	3
PCC-EL-602	Installation and Maintenance of Equipment's	3	0	3
PCC-EL-602	Modern Electric Traction System	3	0	3

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT

ENTREPRENEURSHIP

Paper Code: BSC-601

Semester 6th	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives

1. Sketching an apt business plan
2. Hiring and retaining a skilled workforce
3. Financial Stability
4. Aligning marketing and sales

Course Contents

Unit 1: Entrepreneurship and entrepreneur: Need of Employment and Opportunities, Essential Characteristics of a good Entrepreneur, Industrial Policy, Classification of industries- Micro, small scale, medium scale, large scale, Type of industries- Production, Job based & Service

Unit 2: Entrepreneurial Development: Product identification/ selection, Site selection, Plant layout, Institutional support needed, Pre market survey.

Unit 3: Entrepreneurship Support System and Start-ups: Introduction to start-up's, Role of District Industries Centre in setting up industry, Function of NSIC, SISI, NISIET, NRDC, SSIC, SIDO, NMTC, KVIC, RSMML, Role of state finance corporation, state electricity corporations, pollution control board, BIS, I.S.O. etc.

Unit 4: Introduction to Tax System, Insurance and Acts: Idea of income tax, sales tax, excise duty and custom duty, Industrial and fire insurance, procedure for industrial insurance, Introduction to Industrial acts, factory act, Workmen's compensation act 1923, Apprentice's act 1961, Environmental protection act 1986

Unit 5: Project Report Preparation: Procedure of preparing a project report, Format of project report, Preparation of project report, Introduction to ISO: 9000 Series of Quality System

Key learning Outcomes:

1. Students will be aware about the concepts of Entrepreneurship development and significance of entrepreneurship in economic development.
2. It will help students to know about various acts related to an industry.
3. Students will be able to prepare project report.
4. They will be able to know the support available from Govt. to start a new venture.

Reference Books

1. Khanka S.S., "Entrepreneurship Development" S. Chand.
2. Desai A.N., "Entrepreneurship & Environment" Ashish, New Delhi.
3. Drucker, Peter, "Innovation and Entrepreneurship" Heinemann, London.
4. Jain Rajiv, "Planning a small-scale Industry: A Guide to Entrepreneurs" S.S. Books, delhi.
5. Kumar, S. A., "Entrepreneurship in Small Industry" Discovery, New Delhi.

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT

Industrial Electronics and Control of Drives-II

Paper Code: PCC-EL-601

Semester 6th	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To familiarize with the Industrial Electronics components.
2. To have Basic knowledge of Power converters.
3. To study Electrical Accessories and wiring techniques.

Course Contents

Unit I: Introduction to Thyristor: Basic structure and operation of a Thyristor, two transistor analogy and of Thyristor, V-I characteristics, Methods of triggering a Thyristor, Applications of thyristor, dv/dt and di/dt protection of thyristor, Snubber Circuits and Gate Circuits.

Unit II: Rectifiers: Introduction, types, Working principles and applications of Rectifiers, Uncontrolled rectifiers, controlled rectifiers, Basic structure and operation of uncontrolled and controlled rectifiers under various loads: resistive, inductive and RL load; Three phase configuration of uncontrolled rectifiers.

Unit III: Chopper: Introduction, types of choppers and their working principles and applications: Buck converters, Boost Converters, and Buck-boost converters; working of chopper under both continuous and discontinues conduction mode.

Unit IV: Inverters and Cyclo-converters

Inverters: Introduction, Working principles and applications of Inverters, Voltage source inverters (VSI), Current source inverters (CSI), Structure and operation of VSI and CSI.

Cyclo-converters: Introduction, types, Working principles and applications of Cyclo-converters.

Key learning Outcomes:

1. Understands the concept of Thyristor.
2. Have knowledge of basic Power converters.
3. Learns the application of electronic devices in Power conversion.
4. Learns circuit series in electric home appliances.

Text/Reference books:

1. Industrial Electronics and Control by Biswanath Paul; PHI Learning Private Limited, Delhi, 2014.
2. Industrial Electronics and Control by SK Bhattacharya and S Chatterjee; Tata McGrawHill Publishing Company Limited, New Delhi.
3. Power Electronics handbook devices, circuits, and applications by Muhammad H. Rashid; Butterworth-Heinemann publications.

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT

INSTALLATION AND MAINTENANCE OF EQUIPMENTS

Paper Code: PCC-EL-602

Semester 6th	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To understand about the measuring equipment's.
2. To study about standard parameters

Course Contents

Unit-1: Introduction to Electrical Measuring Instruments: Concept of measurement andinstruments, Concept of measurement of electrical quantities and instruments for their Measurements, sources of error. Types of electrical measuring instruments – indicating, integrating and recording type instruments, Essentials of indicating instruments – deflecting,controlling and damping torque

Unit-2. Ammeters and Voltmeters (Moving coil and moving iron type): Concept of ammeter and voltmeters and difference between them, Construction and working principles of moving Iron and moving coil instruments, Merits and demerits, sources of error and application of these instruments Wattmeter (Dynamometer Type) ,Construction, working principle, merits and demerits of dynamometer type wattmeter, Digital wattmeters.

Unit-3. Energy meter: Induction Type; Construction, working principle, merits and demerits of single-phase and three-phase energy meters, Errors and their compensation, Simple numerical problems , Construction and working principle of maximum demand indicators ,Digital energy meter (diagram, construction and application)

Unit-4. Measuring Instruments: Construction, working principle and application of Meggar, Earth tester (analog and digital) Multimeter, Frequency meter (dynamometer type)single phase power factor meter (Electrodynamometer type). Working principle of synchroscope and phase sequence indicator, tong tester (Clamp-on meter)

Key learning Outcomes:

After undergoing the subject, students will be able to:

1. Connect and repair different indicating and recording instrument in electric circuits.
2. Measure different electrical quantities like current, voltage, power, energy, power factor and frequency.
3. Select the type and range of instruments to be use for the job.
4. Operate CT (Current transformer) and PT (Potential transformer) for measurement.
5. Select and use suitable sensors for measurement of different non-electrical quantities.

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT

MODERN ELECTRIC TRACTION SYSTEM

Paper Code: PCC-EL-602

Semester 6th	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To understand about the Electrified tractive system.
2. To study about standard components of power-driven vehicles

Course Contents

UNIT 1: Introduction: Electric traction system, advantages over other system, types od electric traction systems, Choice of traction system in India, Historical background of track electrification in India, single phase low frequency DC system, Composite System, Disadvantage of single-phase DC system, Comparison between pure AC and DC system.

Track Mechanics: Types of Services (Urban, Suburban and mainline), Speed time curve, Tractive effort and tractive effort speed characteristics, power of traction motor, specific energy consumption, Factors affecting slip.

UNIT 2: Power Supply arrangement: Constituents of Power supply system i.e., substation**,** Sectioning and paralleling post, Subsection and post**,** Sub-sectioning post and elementary sections**,** Major control posts or switching substations**,** Major equipment of substations.

Equipment used in and outside the Locomotive: Block diagram of Locomotive**,** Overhead equipment**,** Section Insulator**,** Polygon OHE**,** supporting structure**,** Current collector**,** Circuit breaker, Tap changer, Transformer, Rectifier connections, Smoothing reactors.

UNIT 3: Traction Motors and Traction Motor Control: Desirable characteristic of traction motors, Comparative study of characteristic of Induction motor, Linear induction motor and their suitability for traction applications, Series parallel control of traction motors, Advantages of series parallel control, Simple numerical problems.

UNIT 4: Braking: Requirements of braking system, Types of brakes (Mechanical, hydraulic, magnetic and eddy current)**,** Electrical braking – plugging**,** Rheostatic and Regenerative braking.

Key learning Outcomes:

Students will learn about Electrical Vehicles.
2. Students will be updated about latest technology.
3. Understands the design of an Electric vehicle.

Reference Books:

1. Iqbal Husain; Electric and Hybrid Vehicles: Design Fundamentals, Third Edition, CRC Press, 2021.
2. Ali Emadi, Mehrdad Ehsani and John M. Miller; Vehicular Electric Power Systems: Land, Sea, Air and Space Vehicles, First Edition, Marcel Dekker, 2004.

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT

FUNDAMENTAL OF ELECTROMAGNETISM

Paper Code: PCC-EL-602

Semester 6th	Sessional – 25 Marks
Stream– Electrical	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To understand about electrostatic and magnetostatic in an electrical circuit.
2. To study about standard parameters.

Course Contents

Unit-1: Introduction to Magnetism: Magnets, Classification of materials, Magnetic polarity, Laws of magnetic force, Ewing's molecular theory of magnetism, Magnetic field, Magnetic Induction, Magnetic flux, Magnetic flux density, Magnetic intensity or magnetizing force, Permeability, Relation between B and H, Intensity of magnetism (J or I), Susceptibility, Relation between B, H, I and K.

Unit-2: Electromagnetism: Electromagnetism, Magnetic effect of electric current, Direction of magnetic lines of force, Typical electromagnetic fields, Electromagnet, Current carrying conductor placed in magnetic field, Work law and its applications, Biot-Savart law, Application of Biot-Savart law, Force between two parallel current carrying conductors, Magnitude of mutual force, one ampere.

Unit-3: Magnetic Circuits: Magnetic circuit and its analysis, Comparison between magnetic and electric circuits, Ampere-turns calculations, series and parallel magnetic circuit, leakage flux, Magnetization or B-H curve, Magnetic Hysteresis, Hysteresis loss, Magnitude of Hysteresis loss, Importance of Hysteresis loss.

Unit-4: Electromagnetic Induction: Electromagnetic Induction, Faraday's law of Electromagnetic Induction, Direction of Induced EMF, Induced EMF, Dynamically and statically induced EMF, Self and mutual inductance and their expressions, Co-efficient of coupling, Inductance in series and parallel, Energy stored in a magnetic field, Magnetic energy stored per unit volume, Lifting power of a magnet, closing and opening of an inductive circuit, Rise and decay of current in an inductive circuit, Eddy current loss.

Key learning Outcomes:

1. Student will be able to connect and repair different indicating and recording instruments in electric circuits.
2. Student will be able to measure different electrical quantities like current, voltage, power, energy, power factor, frequency etc.

J. C. Bose University of Science and Technology, YMCA, Faridabad

(Established by Haryana State Legislative Act No. 21 of 2009 & Recognized by UGC Act 1956 u/s 22)

Accredited 'A' Grade by NAAC

COMMUNITY COLLEGE OF SKILL DEVELOPMENT

Program B. Voc. Electrical (Program Code: 252)

Revised Scheme Course Index of the Year 2020-21 (BOS Dated 18/05/2020)

Mapping of the Courses with the Employability/Entrepreneurship/Skill Development

S. No.	Course Code	Course Name	Skill Development	Entrepreneurship	Employability
1	PCC-EL-101	Electrical Machine - I	✓		✓
2	PCC-EL-105	Electrical Technology	✓		✓
3	BSC- 101	Communication Skills	✓	✓	
4	BSC-102	Engineering Calculations - I	✓	✓	
5	PCC-EL-107	Electrical workshop - I	✓	✓	✓
6	PCC-EL-201	Electrical Machine - II	✓		✓
7	PCC-EL-202	Electrical Wiring	✓		✓
8	PCC-EL-205	Electrical Vehicle	✓		✓
9	BSC-202	Engineering Calculations - II	✓	✓	
10	PCC-EL-206	Electrical workshop - II	✓	✓	✓
11	PCC-EL-307	Industrial Electronics and control of drives - I	✓		✓
12	PCC-EL-305	Electrical Machine - III	✓		✓
13	PCC- EL-306	Power System	✓		✓
14	BSC-302	Soft Skills	✓	✓	
15	PCC-EL-304	PLC Workshop	✓	✓	✓
16	PCC-EL-401	On Job Training (OJT)/ Internship evaluation including report and presentation	✓	✓	✓
17	PCC-EL-501	On Job Training (OJT)/ Internship evaluation including report and presentation	✓	✓	✓
18	BSC-601	Entrepreneurship	✓	✓	
19	PCC-EL-601	Industrial Electronics and control of drives - II	✓		✓
20	PCC-EL-602	Fundamentals of Electromagnetism	✓		✓
21	PCC-EL-602	Installation and Maintenance of Equipment's	✓		✓
22	PCC-EL-602	Modern Electric Traction System	✓		✓
23	BSC-603	Minor project	✓	✓	✓
24	PCC-EL-603	Electrical workshop - III	✓	✓	✓

Principal, CCSD

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD

COMMUNITY COLLEGE OF SKILL DEVELOPMENT

CURRICULAM FOR

B.VOC

WEB DEVELOPMENT
(2020-21)

1ST SEMESTER

1. Introduction

All India Council for Technical Education (AICTE) Ministry of HRD, Government of India has introduced Entrepreneurship oriented Skill development courses of B.Voc/D.Voc/Skill Diploma. These courses will be run by AICTE approved institutes by using available infrastructure and facilities. In these courses the institute will conduct general education content and sector specific skills will be imparted by Skill Knowledge Providers/ Training Providers/ Industries.

1.1 Key Features:

1. Objectives

    1. To provide judicious mix of skills relating to a profession and appropriate content of General Education.
    2. To ensure that the students have adequate knowledge and skills, so that they are work ready exit point of the programme.
    3. To provide flexibility to the students by means of pre-defined entry and multiple exit points.
    4. To integrate NSQF within the Diploma, undergraduate level of higher education to enhance employability of the students and meet industry requirements. Such student apart from meeting the needs of local and national industry are also expected to be equipped to become part of the global workforce.
    5. To provide vertical mobility to students admitted in such vocational courses.
    6. The certification levels will lead to Diploma/Advanced Diploma/B. Voc. Degree in Web Development and will be offered by respective affiliating University.Students may be awarded Level Certificate/Diploma/Advance Diploma /Degree as out-lined in the Table below:

Award	Duration after class X	Corresponding NSQF level
Diploma	3 Year	5
Advance Diploma	4 Years	6
B.Voc Degree	5 Years	7

2. Course Objectives

After successfully completing the vocational course, the student would have acquired relevant appropriate and adequate technical knowledge together with the professional skills and competencies in the field of Web Development so that he/she is properly equipped to take up gainful employment in this Vocation.

Thus he/she should have acquired Understanding of:

(a) The relevant basic concepts and principles in basic science subjects (Communication Skills and Mathematics) so that he/she is able to understand the different vocational subjects.

(b) The basic concepts in networking.

(c) The concepts, principles of working of basic computing devices and circuits.

3. Course Structure

The course will consist of combination of practice, theory and hands on skills in the IT sector.

4. Curriculum

- The curriculum in each of the years of the programme would be a suitable mix of general education and skill components.
- The focus of skill components shall be to equip students with appropriate knowledge, practice and attitude, to become work ready. The skill components will be relevany to the industry as per its requirements.
- The curriculam will necssarily embed within itself, National Occupational Standards (NOSs) of specific job roles withon the industry. This would enable the students to meet the learning outcomes specified in the NOSs.
- Adequate attention will be given in curriculam design to practical work, on the job training, development of student portfolios and project work.
- General Education Component:
- The general education component adhere to the normal senior secondary and university standards. It will emphasize and offer courses which provide holistic development. However, it will not exceed 40% of total curriculam. Adequate emphasis is given to language and communication skills.

SEMESTER – I SCHEME

Paper Code	Paper	L	T/P	Credits
PCC-WD-101	BASICS OF OPERATING SYSTEM	3	0	3
PCC-WD-104	FUNDAMENTALS OF NETWORK AND SAFETY	3	0	3
BSC-102	ENGINEERING CALCULATIONS	3	0	3
BSC-101	COMMUNICATION SKILLS	3	0	3
PCC-WD-106	COMPUTER WORKSHOP	0	18	18

Detailed Curriculum

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD

Community college of skill development

Basics of operating system

Paper Code: PCC - WD - 101

Semester: 1st
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional : 25 Marks
Theory: 75 Marks
Total: 100 Marks

Duration of Exam: 3 Hours

Course Objectives:

1. To learn the fundamentals of Operating Systems.
2. To learn the mechanisms of OS to handle processes.
3. To learn the mechanisms involved in memory management in contemporary OS.
4. To gain knowledge on file management aspects of Operating systems

Course Content:

Unit 1: Operating Systems: Concept of Operating Systems, Need of operating system, Types of Operating Systems, Services of operating system, Structure of an operating system, Functions of operating system.

Unit 2: Processes: Definition, Different states of a Process, Process Scheduling, Types of Schedulers, and Scheduling criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time. Scheduling algorithms, FCFS, SJF, Priority, RR, Multiprocessor scheduling.

Unit 3: Memory & File Management: Logical and Physical address space, Swapping, Contiguous Memory allocation, Virtual Memory, Paging, Segmentation. Concept of File, Access methods, Directory structure, File System structure, Allocation methods.

Unit 4: Study of various Operating Systems: Windows, Dos, Linux etc.

Key Learning Outcomes:

Candidates will be able to:

1. Create processes.
2. Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, and Response Time.
3. For a given specification of memory organization, develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time.
4. Design and implement file management system.

Reference Books:

1. Operating System Concepts by Silberchatz et al, 5th edition, 1998, AddisonWesley.
2. Modern Operating Systems by A. Tanenbaum, 1992, Prentice-Hall.
3. Operating Systems Internals and Design Principles by William Stallings,4th edition, 2001, Prentice Hall.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
Community college of skill development
Fundamentals of Network and Safety
Paper Code: PCC– WD - 104

Semester: 1st
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional : 25 Marks
Theory: 75 Marks
Total: 100 Marks

Duration of Exam: 3 Hours

Course Objectives:

1. To learn about computer networks and its various types.
2. To learn about underlying areas of web programming.
3. To learn about basics of internet.
4. To learn about various health and safety procedures.

Course Contents:

Unit 1 : Basics of Computer Networks : Introduction of computer network, need for networking, advantages of computer network, network topologies.Types of computer networks: LAN, MAN, WAN, (features, advantages and disadvantages), difference between LAN and WAN.

Unit 2 : Introduction to Internet : Introduction to Web browser, WWW, Searching Internet.Services of internet: E-mail, Social Internet Media and its benefits.

Unit 3 : Web Programming : Introduction to web programming, Basics of HTML: HTML tags, page structure, lists, tables, Introduction to CSS and Java Script.

Unit 4 : Managing Health and Safety : Importance of safety, Objectives of safety management, Hazards and its types, Health safety, Different types of breaches, Evacuation procedures, Medical assistance, Security policies and procedures.Government agencies in the areas of safety, health and security and their norms and services.

Key Learning Outcomes

Candidates will be able to:

1. Demonstrate basic computer networking concepts.
2. Operating a browser, searching the internet, managing mails and using social internet media.
3. Understand web programming.
4. Comply with organization's current health, safety and security policies and procedures.

Reference Books:

1. Sudhakshina Kundu, Fundamentals of Computer Networks.
2. Tenenbaum, Computer Networks.
3. Fundamentals of Web Development by Randy Connolly.
4. Industrial Safety Management by L.M Deshmukh, Tata Mcgraw Hill Publication.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
Community college of skill development
Communication Skills
Paper Code: BSC – 101

Semester: 1st
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional : 25 Marks
Theory: 75 Marks
Total: 100 Marks

Duration of Exam: 3 Hours

Course Objectives:

1. To discuss types of communication and their forms
2. To improve comprehension
3. To improve spoken English and ability to articulate ideas
4. To improve formal writing skills

Course Contents:

Unit 1 : Introduction to Communication : Meaning of communication, Importance and function of communication, Types of communication; language of communication; advantages and disadvantages, Barriers to Communication.

Unit 2 : Grammar : Parts of speech, Articles, Tenses, Formation of Sentences, Active and Passive Voice, Direct and Indirect speech.

Unit 3 : Writing and Comprehension : Comprehension, Composition, Letter writing, Translation, Paraphrasing.

Unit 4 : Practical Communication : 7 Cs of Communication, Grice's Cooperative Principle, Group Discussions; Public Speaking; Facing Interviews.

Key Learning Outcome:

Candidate will be able to:

1. To learn about communication process, and ways to make communication effective by giving attention to all elements involved.
2. To improve grammar and gain confidence by enhancing their abilities to articulate their ideas.
3. To acquire better writing skills in formal communication.
4. To be able to revise documents for fruitful reading and comprehension.

Reference Books:

1. 1. Wren and Martin. High School English Grammar and Composition. New Delhi: RRP, 2007
2. 2. Murphy, Raymond. Essential English Grammar . New Delhi: Cambridge, 2017
3. 3. Malhotra, Prerna and Halder, Deb. Communication Skill s: Theory and Practice. New Delhi: M.S. Indian

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
Community college of skill development
Computer Workshop
Paper Code: PCC- WD - 108

Semester: 1st
Stream: Web Development
L T P Total Credits
0 0 18 18

Internal: 30 Marks
External: 20 Marks
Total: 50 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. To be familiar with syntax and structure of C-Programming
2. To learn problem solving techniques using C.
3. To be familiar with different data types, Operators and Expressions in C.
4. To be familiar with formatted and unformatted I/O in C with preprocessor directives.
5. To understand the programming using Loop & nested loop Statements (for, while, do-while).
6. To understand programming using different dimensions of Array.
7. To understand programming with Pointer, String and Function call by reference.

Course Contents:

C-Programming

1. Write a program to display "hello world" in C.
2. Write a program to add two numbers (5&7) and display its sum.
3. Write a program to multiply two numbers (10&8) and display its product.
4. Write a program to calculate area of a circle having its radius (r=5).
5. Write a program to calculate area of an ellipse having its axes (minor=4cm, major=6cm).
6. Write a program to calculate simple interest for a given P=4000, T=2, R=5.5. (I = P*T*R/100)
7. Write a program to declare two integer and one float variables then initialize them to 10, 15, and 12.6. Also print the variable values in the screen.
8. Write a C program to prompt the user to input 3 integer values and print these values in forward and reversed order.
9. Write a program to calculate simple and compound interest.
10. Write a program to swap two variables values with and without using third variables
11. Write a program to check odd or even number
    (a) using modulus operator
    (b) using bitwise operator
    (c) without using bitwise and modulus operator
    (d) using conditional operator.
12. Print the value of y for given x=2 & z=4 and analyze the output.
    a. y = x++ + ++x;
    b. y= ++x + ++x;
    c. y= ++x + ++x + ++x;
    d. y = x>z;
    e. y= x>z? x:z;
    f. y = x&z;
    g. y= x>>2 + z<<1;
13. Write a program to print the size of char, float, double and long double data types in C.
14. Write a program to produce the output as shown below:

x	y	expressions	results
6	3	x=y+3	x=6
6	3	x=y-2	x=1
6	3	x=y*5	x=15
6	3	x=x/y	x=2

6 | 3 | x=x%y | x=0

15. Demonstrate the differences among getch(), getche(), getchar(). Demonstrate the difference between scanf() & gets(), printf() & puts().
16. Write a program to check whether input alphabet is vowel or not using if-else and switch statement.
17. Write a program that asks a number and test the number whether it is multiple of 5 or not.
18. Write a program to check whether the entered year is leap year or not (a year is leap if it is divisible by 4 and divisible by 100 or 400.)
19. Write a program to input two integer numbers and display the sum of even numbers between these two input numbers.
20. Write a program to find GCD (greates common divisor or HCF) and LCM (least common multiple) of two numbers.
21. Write a program to display Fibonacci series of last term up to 300.
22. Write a program to enter 10 floating numbers in an array and display it.
23. Write a program to initialize one dimensional array of size 8 and display the sum and average of array elements.
24. Write a program to find biggest among three numbers using pointer.
25. Write a program to find the sum of all the elements of an array using pointers.
26. Write a program to swap value of two variables using pointer.
27. Write a program to read a sentence and count the number of characters &words in that sentence.
28. Write a program to copy one string to another string with and without using string handling function.
29. Write a program to concatenate two strings.
30. Write a program to compare two strings.

SEMESTER – II SCHEME

Paper Code	Paper	L	T/P	Credits
PCC-WD-203	WEB DESIGNING	3	0	3
PCC-WD-205	OBJECT ORIENTED PROGRAMMING	3	0	3
BSC-206	EMPLOYABILITY SKILLS	3	0	3
BSC-202	ENGINEERING CALCULATIONS - II	3	0	3
PCC-WD-207	HTML LAB	0	6	6
PCC-WD-208	COMPUTER LAB	0	12	12

Detailed Curriculum

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
WEB DESIGNING - HTML AND CSS
Paper Code: PCC-WD-203

Semester: 2nd | Sessional: 25Marks
Stream: Web Development | Theory: 75 Marks
L T P Total Credits | Total: 100 Marks
3 0 0 3 | Duration of Exam: 3 Hours

Course Objectives:

1. Understand the principles of creating an effective web page
2. Develop skills in analyzing the usability of a web site.
3. Understand how to plan and conduct user research related to web usability.
4. Learn the language of the web: HTML and CSS.

Course Contents:

Unit-I: Web Design Principles : Basic Principles involved in developing a web site, Planning process, Five Golden rules of Web Designing, World Wide Web, Why create a web site, Web Standards

Unit-2: Introduction to HTML : What is HTML, HTML Documents, Basic structure of an HTML document, Creating an HTML document, Mark up Tags, Heading-Paragraphs, Line Breaks, HTML Tags.Elements of HTML: Introduction to elements of HTML, Working with Text, Working with Lists, Tables and Frames; Working with Hyperlinks, Images and Multimedia; Working with Forms and controls.

Unit- 4: Introduction to Cascading Style Sheets: Concept of CSS, Creating Style Sheet, CSS Properties, CSS Styling(Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables, CSS Id and Class, Box Model(Introduction, Border properties, Padding Properties, Margin properties), CSS Color, Creating page Layout and Site Designs.

Unit – 5 JavaScript introduction : What is JavaScript,Understanding Events, JavaScript Example, External JavaScript

Key Learning Outcomes

Candidates will be able to:

1. Discover how does web works really, what makes web sites work.
2. Employ fundamental computer theory to basic programming techniques.
3. Create an Information Architecture document for a web site.
4. How to and where to start research, planning for website
5. Use fundamental skills to maintain web server services required to host a website.

Reference Books:

1. Satish Jain, Ambrish K. Rai and M. Geetha, Web Designing and Development, BPB Publications.
2. Hirdesh Bhardwaj, Web Designing.
3. Jon Duckett, HTML & CSS: Design and Build Web Sites

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
ENGINEERING CALCULATIONS
Paper Code:BSC-202

Semester: 2nd
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional: 25Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives

1. To familiarize the prospective engineers with Basics of mathematics
2. To understand fundamental arithmetical operations.
3. To learn Unit systems, Fractions and Decimals, roots, percentage.
4. To have Knowledge of differential quantities

Course Contents

UNIT-I Complex number: Definition of Complex Number, Operations on Complex Number (Add., Sub., Multiplication, Division), Conjugate Complex Number, Modulus and Amplitude of a Complex Number, Polar form of a Complex Number.

Unit -II Matrices and Determinants: Definition and Properties of Determinants, Definition and Types of Matrix, Transpose of a Matrix, Symmetric, Skew Symmetric Matrices, Orthogonal matrices, Hermitian and Skew Hermitian, Minors and Cofactors, Adjoint and Inverse of a Matrix, Cramer's Rule, Solution of Simultaneous Linear Equations by Inverse Matrix Method, Characteristic Matrix, Characteristic Equation, Eigen Values & Vectors, Cayley Hamilton Theorem (verification only).

Unit - III Differentiation: Introduction to Derivatives, Product Rule, Quotient Rule, Chain Rule, Derivatives of Algebraic Function, Derivative of Trigonometric Functions, partial derivative.

Unit - IV Statistics: Measures of Dispersion: Range, Mean deviation, variance and standard deviation of ungrouped/grouped data. Analysis of frequency distributions with equal means but different variances.

Course Outcomes:

1. Students will learn about complex number.
2. Students will learn about matrix and determinants.
3. Students will able to deal with derivative Problems.
4. Students will able solve and learn integration.

Reference Books:

1. Mathematics Book by R.D Sharma
2. Advanced Engineering Mathematics By Jain Rk.
3. A Basic Course in Mathematics By Nabjyoti Dutta.
4. Skills in Mathematics By Amit M Aggarwal.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
OBJECT ORIENTED PROGRAMMING
Paper Code:PCC-WD-205

Semester: 2nd
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional: 25Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. To be familiar with the main features of the C++ language.
2. Be able to understand C++ program to solve a well specified problem.
3. Understand a C++ syntax written by someone else.

Course Contents:

Unit-1: Concepts of OOP
Introduction OOP, Procedural Vs. Object Oriented Programming, Principles of OOP, Benefits and applications of OOP.
Unit-2: C++ Basics
Overview, Program structure, namespace, identifiers, variables, constants, enum, operators, typecasting, control structures.
Unit-3: C++ Functions
Simple functions, Call and Return by reference, Inline functions, Macro Vs. Inline functions, Overloading of functions, default arguments, friend functions, virtual functions.
Unit-4: Objects and Classes
Basics of object and class in C++, Private and public members, static data and function members, constructors and their types, destructors, operator overloading, type conversion.
Unit-5: Inheritance
Concept of Inheritance, types of inheritance: single, multiple, multilevel, hierarchical, hybrid, protected members, overriding, virtual base class.
Unit-6: Polymorphism
Pointers in C++, Pointes and Objects, this pointer, virtual and pure virtual functions, Implementing polymorphism.
Unit-7: I/O and File Management
Concept of streams, cin and cout objects, C++ stream classes, Unformatted and formatted I/O, manipulators, File stream, C++ File stream classes, File management functions, File modes, Binary and random Files.
Unit-8: Templates, Exceptions and STL
What is template? function templates and class templates, Introduction to exception, try-catch- throw, multiple catch, catch all, rethrowing exception, implementing user defined exceptions, Overview and use of Standard Template Library.

Course Outcomes:

1. Describe the important concepts of object oriented programming like object and class, Encapsulation, inheritance and polymorphism.
2. Write the skeleton of C++ program.
3. Write the simple C++ programs using the variables, operators, control structures, functions.
4. Write the simple object oriented programs in C++ using objects and classes, inheritence, file management, exceptions etc..

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
EMPLOYABILITY SKILLS
Paper Code:BSC-206

Semester: 2nd
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional: 25Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. To discuss types of communication and their forms.
2. To improve comprehension.
3. To improve spoken English and ability to articulate ideas
4. To improve formal writing skills

Course Contents:

Unit 01

Communication skill: Oral and written communication Listening skills, written communications, motivation, ethics, Time management, facing job interviews, behaviour skills, Assessing oneself.

Unit -02

English Literacy – Pronunciation, listening speaking and reading: - greetings and introductions describing people, Telephone skills, Office Hospitality, Describing things.

Unit -03

Entrepreneurship skills- 1: - Scope and advantage of self-employment, Entrepreneurial skills, values and attitudes, Characterchicts of Successful Entrepreneurs, Identification of entrepreneurs bu self-assessment, Micro, small and medium enterprises, Creativity and idea generation.

Unit -04

Entrepreneurship Skills – 2: - Understanding Consumer, Market Survey: Scope & Influence of publicity and advertisement, Accounting and analysis, Assistance provided by Central and State Govt. Organisations, Project formation, feasibility and profitability estimates, Filling up a Preliminary Project Report Proforma, Investment procedure-loan procurement.

Course Outcome:

1. To learn about communication process and ways to make communication effective by giving attention to all elements involved.
2. To improve grammar and gain confidence by enhancing their abilities to articulate their ideas.
3. To acquire better writing skills in formal communication.
4. To be able to revise documents for fruitful reading and comprehension

Reference books:

1. Wren and Martin. High School English Grammar and Composition. New Delhi: RRP, 2007
2. Murphy, Raymond. Essential English Grammar. New Delhi: Cambridge, 2017
3. Malhotra, Prerna and Halder, Deb. Communication Skills: Theory and Practice.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
HTML LAB
Paper Code:PCC-WD-207

Semester: 1st	Internal: 30 Marks
Stream: Web Development	External: 20 Marks
L T P Total Credits	Total: 50 Marks
0 0 6 6	Duration of Exam: 3 Hours

Course Objectives:

1. To Acquire knowledge and Skills for creation of Web Site considering both client- and server- side Programming.
2. To create Web application using tools and techniques used in industry.
3. To be well versed with XML and web services Technologies.
4. To be familiarized with open source Frameworks for Software Development .

Course Contents:

1. Generic awareness about Hyper Text Markup Language (HTML).
2. Designing of websites.
3. Basics of HTML tags.
4. Functional knowledge of web hosting
5. Basics of Networking

Course Outcomes:

` 1. Design a basic web site using HTML5 and CSS3 to demonstrate responsive web design.
2. Develop simple web application using server side PHP programing and Database Connectivity using MySQL.
3. Build well-formed XML Document and implement Web Service using Java.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
COMPUTER LAB
Paper Code:PCC-WD-208

Semester: 2nd	Internal: 30 Marks
Stream: Web Development	External: 20 Marks
L T P Total Credits	Total: 50 Marks
0 0 12 12	Duration of Exam: 3 Hours

Course Objectives:

1. To be familiar with the main features of the C++ language.
2. Be able to write a C++ program to solve a well specified problem.
3. Understand a C++ program written by someone else.
4. Be able to debug and test C++ programs;
5. Understand how to read C++ doc library documentation and reuse library code.
6. To understand the features of object oriented principles and be familiar with virtual functions, templates and exception handling.
7. To develop applications using C++.

Course Contents:

1. Write a C++ program to find the largest of three numbers using inline function.
2. Write a C++ program to sort an array of integer in ascending order using a function called exchange( ) which accepts two integer arguments by reference.
3. Write a C++ program to implement function overloading in order to compute power(m,n) where
   i) m is double and n is int
   ii) m and n are int.
4. Create a 'DISTANCE' class with : - feet and inches as data members - member function to input distance - member function to output distance - member function to add two distance objects Write a main function to create objects of DISTANCE class. Input two distances and output the sum.
5. Create a class called 'EMPLOYEE' that has - EMPCODE and EMPNAME as data members - member function getdata( ) to input data - member function display( ) to output data Write a main function to create EMP, an array of EMPLOYEE objects. Accept and display the details of at least 6 employees.
6. Create a class called 'TIME' that has - three integer data members for hours, minutes and seconds - constructor to initialize the object to zero - constructor to initialize the object to some constant value - member function to add two TIME objects - member function to display time in HH:MM:SS format Write a main function to create two TIME objects, add them and display the result in HH:MM:SS format.
7. Create a class 'COMPLEX' to hold a complex number. Write a friend function to add two complex numbers. Write a main function to add two COMPLEX objects.
8. Create a 'MATRIX' class of size m X n. Overload the‘+’ operator to add two MATRIX objects. Write a main function to implement it.
9. Derive a class ‘MAT’ from MATRIX class created in program No. 8. Add a member function to overload ‘*’ operator to multiply two objects. (Single Inheritance)
10. Write a c++ program to illustrate multilevel inheritance.
11. Write a c++ program to illustrate multiple inheritance
12. Create a 'STRING' class which overloads ‘ = = ' operator to compare two STRING objects.
13. Write a C++ program to illustrate ‘this’ pointer and pointers to derived classes.
14. Create a base class called 'SHAPE' having - two data members of type double - member function get-data( ) to initialize base class data members - pure virtual member function display-area( ) to compute and display the area of the geometrical object. Derive two specific classes 'TRIANGLE' and 'RECTANGLE' from the base class. Using these three classes design a program that will accept dimension of a triangle / rectangle interactively and display the area.

15. Write a C++ program to read a list containing item name, item code and cost interactively and display the data in a tabular format as shown below:

NAME	CODE	COST

16. Design your own manipulator to provide the following output specification for printing money value:
    1) 10 columns width
    2) The character '$' at the beginning
    3) Showing '+' sign.
    4) Two digits precision
    5) Filling of unused spaces with ' * '
    6) Trailing zeros shown

17. Write a C++ program that uses a single file for both reading and writing the data.
18. A file contains a list of names and telephone numbers in the following form:
    Name Tel. No.
    Write a C++ program to read the file and output the list in the tabular format. The name should be left-justified and numbers right-justified. Use a class object to store each set of data.
19. Write an interactive, menu-driven program that will access the file created in program No.17 and implement the following tasks:
    i) To determine the telephone numbers of the specified person.
    ii) To determine the name if a telephone number is given.
    iii) To update the telephone number whenever there is a change.
20. Write a C++ program that displays the size (in bytes) of a given file. The name of the file is specified as command line argument.
21. Define a function template for finding the minimum value contained in an array. Write main( ) function to find the minimum value of integer array and minimum value of floating point numbers in an array.
22. Write a class template to represent a generic vector. Include member functions to perform the following tasks:
    1) To create the vector.
    2) To modify the value of a given element.
    3) To multiply the vector by a scalar value.
    4) To display the vector in the form (10, 20, 30,…..)

Key Learning Outcomes
Candidates will be able to:

1. Understand and use the basic programming constructs of C/C++
2. Manipulate various C/C++ datatypes, such as arrays, strings, and pointers
3. Isolate and fix common errors in C++ programs
4. Use memory appropriately, including proper allocation/deallocation procedures
5. Apply object-oriented approaches to software problems in C++
6. Write C++ programs using the above skills

SEMESTER – III SCHEME

Paper Code	Paper	L	T/P	Credits
BSC-301	SOFT SKILLS	3	0	3
PCC-WD-301	HTML AND CSS	3	0	3
PCC-WD-302	COMPUTER GRAPHICS	3	0	3
PCC-WD-303	SOFTWARE ENGINEERING	3	0	3
PCC-WD-304	COMPUTER LAB	0	12	12

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
HTML & CSS
Paper Code: PCC-WD-301

Semester: 3rd
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional: 25Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. Understand the principles of creating an effective web page
2. Develop skills in analyzing the usability of a web site.
3. Understand how to plan and conduct user research related to web usability.
4. Learn the language of the web: HTML and CSS.

Course Content

UNIT-1: Introduction: History of HTML, HTML Tags and Attributes?, HTML Tag vs. Element, HTML Attributes. Basic Formatting Tags: HTML Basic Tags,HTML Formatting Tags,HTML Color Coding. Lists: Unordered Lists, Ordered Lists, Definition List. Images and HTML-Hyperlinks: Image and Image Mapping, URL - Uniform Resource Locator, URL Encoding

UNIT-II : HTML-Table: <table>, <th>, <tr>, <td>. HTML-Iframe: Attributes Using, Iframe as the Target. HTML-Form: <input>, <textarea>,<button>,<select>,<label> etc. HTML-Headers: Title,Base,Link,Style sheets,Script,Meta.

UNIT-III: CSS2-Introduction: Benefits of CSS,CSS Versions History,CSS Syntax,External Style Sheet using <link>,Multiple Style Sheets,Value Lengths and Percentages. CSS2-Syntax: CSS Syntax, single Style Sheets, Multiple Style Sheets,Value Lengths and Percentages. CSS2-Selectors: ID Selectors, Class Selectors, Grouping Selectors, Universal Selector, Descendant / Child Selectors, Attribute Selectors, CSS – Pseudo Classes. Color Background Cursor: background-image, background-repeat, background-position, CSS Cursor.

UNIT-IV*:* CSS2-Text Fonts:color, background-color, text-decoration, text-align, vertical-align, text-indent, text-transform, white-space, letter-spacing, word-spacing, line-height, font-family, font-size, font-style,font-variant, font-weight. CSS2-Lists Tables: list-style-type, list-style-position, list-style-image, list-style, CSS Tables : 1. border 2.width & height 3.text-align 4.vertical-align 5.padding 6.color CSS2-Box Model: Borders & Outline,Margin & Padding, Height and width, CSS Dimensions. CSS2-Display Positioning: CSS Visibility, CSS Display, CSS Scrollbars, CSS Positioning- 1.Static Positioning, 2.Fixed Positioning, 3.Relative Positioning

Key Learning Outcomes

Candidates will be able to:

1. Discover how does web works really, what makes web sites work.
2. Employ fundamental computer theory to basic programming techniques.
3. Create an Information Architecture document for a web site.
4. How to and where to start research, planning for website
5. Use fundamental skills to maintain web server services required to host a website.

Reference Books:

1. Satish Jain, Ambrish K. Rai and M. Geetha, Web Designing and Development, BPB Publications.
2. Hirdesh Bhardwaj, Web Designing.
3. Jon Duckett, HTML & CSS: Design and Build Web Sites

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
COMPUTER GRAPHICS
Paper Code:BSC-206

Semester: 3rd
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional: 25Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. Gain knowledge about graphics hardware devices and software used
2. Understand the two dimensional graphics and their transformations.
3. Understand the three dimensional graphics and their transformations.
4. Appreciate illumination and color models.
5. Be familiar with understand clipping techniques.

Course Content:

UNIT-1 Introduction to Computer Graphics: What is Computer Graphics, Computer Graphics Applications, Computer Graphics Hardware and software, two dimensional Graphics Primitives: Points and Lines, Line drawing algorithms: DDA, Bresenham's; Circle drawing algorithms: Using polar coordinates, Bresenham's circle drawing, midpoint circle drawing algorithm; Filled area algorithms: Scanline: Polygon filling algorithm, boundary filled algorithm. Two/Three Dimensional Viewing: The 2-D viewing pipeline, windows, viewports, window to view port mapping; Clipping: point, clipping line (algorithms):- 4 bit code algorithm, Sutherland-Cohen algorithm.

UNIT-2 Polygon clipping algorithm: Sutherland-Hodgeman polygon clipping algorithm. Two dimensional transformations: transformations, translation, scaling, rotation, reflection, composite transformation. Three-dimensional transformations: Three dimensional graphics concept, Matrix representation of 3-D Transformations, Composition of 3-D transformation.

UNIT-3 Viewing in 3D: Projections, types of projections, Hidden surface removal: Introduction to hidden surface removal. The Z- buffer algorithm, scanline algorithm, area sub-division algorithm.

UNIT-4: Illumination, shading, image manipulation: Illumination models, shading models for polygons, shadows, transparency. What is an image? Filtering, image processing, geometric transformation of images.

Key Learning Outcomes:

1. At the end of the course, the student should be able to:
2. Design two dimensional graphics.
3. Apply two dimensional transformations.
4. Design three dimensional graphics.
5. Apply Illumination and color models.

Reference Books:

1. Donald Hearn and M. Pauline Baker, Warren Carithers,"Computer Graphics With Open GL", 4th Edition, Pearson Education, 2010.
2. Jeffrey McConnell, "Computer Graphics: Theory into Practice", Jones and Bartlett Publishers, 2006.
3. Hill F S Jr., "Computer Graphics", Maxwell Macmillan" , 1990.
4. Peter Shirley, Michael Ashikhmin, Michael Gleicher, Stephen R Marschner, Erik Reinhard, KelvinSung, and AK Peters, Fundamental of Computer Graphics, CRC Press, 2010.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
SOFTWARE ENGINEERING
Paper Code: PCC-WD-302

Semester: 3rd
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional: 25Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1 Basic understanding of software product,
2 software design and development process
3 software project management and design complexities

Course Contents:

UNIT-1 Software Overview: Definitions, Software Evolution & its laws, E-Type Software Evolution, Software Paradigm, Need of Software Engineering, Characteristics of Good Software.

Software Development Life Cycle: SDLC Activities & Software Development Paradigm. Software Project Management: need of software project management, Software Project manager, Software Management Activities, Project Planning, Scope Management, Project Estimation & its Techniques. Project Scheduling, Resource Management, Project Risk Management, Project Execution & Monitoring, Project Communication Management, Configuration Management, Project Management Tools.

UNIT-2 Software Requirements: Requirement Engineering, Requirement Engineering Process, Requirement Elicitation Process, Requirement Elicitation Techniques, Software Requirements Characteristics Software Requirements, User Interface Requirements, Software System Analyst Software Metrics and Measures.

Software Design Basics: Software Design Levels, Modularization, Concurrency, Coupling and Cohesion, Design Verification.

UNIT-3 Software Analysis and Design Tools: Data Flow Diagram, Structure Charts, HIPO Diagram, Structured English, Pseudo-Code, Decision Tables, Entity-Relationship Model, Data Dictionary

Software Design Strategies: Structured Design, Function Oriented Design, Object Oriented Design, Software Design Approaches.

UNIT-4 Software User Interface Design: Command Line Interface (CLI), Graphical User Interface, User Interface Design Activities, GUI Implementation Tools

Software Design Complexity: Halstead's Complexity Measures, Cyclomatic Complexity Measures, Function Point.

Software Implementation: Structured Programming, Functional Programming, Programming Style, Software Documentation, Software Implementation Challenges

Software Testing Overview: Software Validation, Software Verification, Manual Vs Automated Testing, Testing Approaches, Testing Levels, Testing Documentation, Testing Vs. Quality Control & Assurance and Audit.

Key Learning Outcome:

1 Identify the key activities in managing a software project.
2 Compare different process models.
3 Concepts of requirements engineering and Analysis Modelling.
4 Apply systematic procedure for software design and deployment.
5 Compare and contrast the various testing and maintenance

Reference Books:

1. Software Engineering – A Practitioner's Approach, Roger S. Pressman, 1996, MGH.
2. Fundamentals of software Engineering, Rajib Mall, PHI
3. Software Engineering by Ian sommerville, Pearson Edu, 5th edition, 1999, AW,

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
SOFT SKILLS
Paper Code:BSC-301

Semester: 3rd
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional: 25Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives

1 To help the students in building interpersonal skills.
2 To develop skill to communicate clearly.
3 To enhance team building and time management skills.
4 To learn active listening and responding skills.

Course Contents

UNIT 1: GRAMMAR AND VOCABULARY

1.Tenses, 2. Subject–verb agreement. 3. Sentence Analysis: Simple, Compound and Complex sentences. 4. Phrases: Adjective, Adverb and Noun Phrase, 5. Clauses: Adjective, Adverb and Noun Phrase. 6. Voice, Narration, Gerund, Participle.

UNIT 2: ORAL COMMUNICATION

1. Listening Skill – Active listening, Barriers to active listening. 2. Speaking Skill-Stress patterns in English, 3. Questioning skills, 4. Barriers in Speaking 5. Reading Skill-Skimming, Scanning, Intensive reading, 6. linking devices in a text, 7. Different versions of a story/ incident.

UNIT 3: WRITING SKILLS

Letter writing, Business letters • Application letters • Covering letters • Report writing o Academic report o Business report o Technical report o Technical project report • Job Application and Resume writing

UNIT- IV: SOFT SKILLS

1.Body Language– Gesture, posture, facial expression. 2. Group Discussion– Giving up of PREP, REP Technique. 3. Presentation Skills: a. (i) How to make power point presentation b. (ii) Body language during presentation 4. Resume writing: Cover letter, career objective, Resume writing (tailor made) 5. Interview Skills: Stress Management, Answering skills.

UNIT- 5: STRESS AND TIME MANAGEMENT

Introduction • Stress In Today's Time • Identifying The Stress Source • Signs Of Stress • Ways To Cope With Stress • Healthier Ways To Deal With Stress • Time Management • Prioritize Your Work • Smart Work • Four Ds Of Decision Taking.

Key Learning Outcomes:

1 Self-Awareness, Personal Development, and Life Skills
2 Leadership and Communication
3 Social Justice and Responsibility

Reference books:

1. Advanced English Usage: Quirk & Greenbaum; Pearson Education.
2. Developing Communication Skills: Banerjee Meera & Mohan Krishna; Macmillan Publications, 1990.
3. Personality Development and Group Discussions by Barun K. Mitra, Oxford University Press

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
COMPUTER LAB
Paper Code: PCC-WD-304

Semester: 3rd	Internal : 30 Marks
Stream: Web Development	External: 20 Marks
L T P Total Credits	Total: 50 Marks
0 0 0 12	Duration of Exam: 3 Hours

Course Objectives:

1. Understand the principles of creating an effective web page
2. Develop skills in analyzing the usability of a web site.
3. Understand how to plan and conduct user research related to web usability.
4. Learn the language of the web: HTML and CSS.

List of Practicals:

1. A Program to illustrate body and pre tags
2. A Program to illustrate text Font tag
3. A Program to illustrate comment,h1….h6, and div tag
4. A Program to illustrate text formatting tags
5. A Program to illustrate Order List tag
6. A Program to illustrate Unorder List tag
7. A Program to illustrate Nested and Definition tag
8. A Program to illustrate Img tag
9. A Program to illustrate Hyper Link tag (Anchor tag)
10. A Program to illustrate Table tag
11. A Program to illustrate Frame tag
12. A Program to illustrate Form tag
13. A Program to illustrate Class & ID selector in style tag.
14. A Program to illustrate CSS (cascading style sheet)
15. A Program to illustrate External CSS in web Page

SEMESTER – IV SCHEME

S.NO.	PAPER CODE	SUBJECT	TEACHING SCHEDULE	EXAMINATION SCHEDULE (MARKS)		TOTAL MARKS	CREDITS
1	PCC-WD-401	ON-JOB TRAINING	8 hours per day for one semester	200	300	500	30

Procedure for Annual Examination and continuous Assessment

(A) Annual Exams Marks

1. Project Evaluation 50 Marks
2. Project Seminar 50 Marks
3. Project Viva 100 marks

(B) Continuous Assessment Marks

1. Assessment by Institute faculty 100 Marks
2. Assessment by Industrial Guide 150 Marks
3. Conduct Marks 50 Marks

Total 500 Marks

SEMESTER – V SCHEME

S.NO.	PAPER CODE	SUBJECT	TEACHING SCHEDULE	EXAMINATION SCHEDULE (MARKS)		TOTAL MARKS	CREDITS
1	OJT-WD-501	ON-JOB TRAINING	8 hours per day for one semester	200	300	500	30

Procedure for Annual Examination and continuous Assessment

(A) Annual Exams Marks

1. Project Evaluation 50 Marks
2. Project Seminar 50 Marks
3. Project Viva 100 marks

(B) Continuous Assessment Marks

1. Assessment by Institute faculty 100 Marks
2. Assessment by Industrial Guide 150 Marks
3. Conduct Marks 50 Marks

Total 500 Marks

SEMESTER – VI

SCHEME

Paper Code	Paper	L	T/P	Credits
PCC-WD-602	INTRODUCTION TO PYTHON	3	0	3
BSC-601	ENTREPRENEURSHIP	3	0	9
BSC-602	MINOR PROJECT	0	12	12
PCC-WD-603	PYTHONLAB	0	09	09
Elective Courses : Select any one				
PCC-WD-601	TECHNOLOGY TRENDS IN IT	3	0	3
PCC-WD-604	INTRODUCTION TO AI	3	0	3
PCC-WD-605	COMPUTER NETWORK SECURITY	3	0	3

Detailed Curriculum

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
TECHNOLOGY TRENDS IN IT
Paper Code: PCC-WD-601

Semester:6th	Sessional: 25Marks
Stream: Web Development	Theory: 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	
	Duration of Exam: 3 Hours

Course Objectives:

1. Student will be able to learn the basics of IOT.
2. Student will be able to analyse basic protocols of wireless and MAC.
3. Students will get familiar with web of things.
4. Students will get basic knowledge of resource management.

Course Contents:

Unit-I

Internet of Things (IoT) – Introduction to IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models &APIs ,IoT& M2M Machine to Machine, Difference between IoT and M2M, Software define Network, Challenges in IoT(Design ,Development, Security), Wireless medium access issues, MAC protocol survey, Survey routing protocols, Sensor deployment & Node discovery, Data aggregation & dissemination.

Unit-II

Internet of Things (IoT): Web of Things vs Internet of things, two pillars of web, Architecture and standardization of IoT, Unified multitier-WoT architecture, WoT portals and Business intelligence, Domain specific applications of IoT, Home automation, Industry applications, Surveillance applications, Other IoT applications Clustering, Synchronization, Software agents.

Unit-III

Cloud Computing : SaaS, PaaS, IaaS, Public and Private Cloud; Virtualization, Virtual Server, Cloud Storage, Database Storage, Resource Management, Service Level Agreement, Basics of IoT.

Unit-IV

Big Data Systems: Big Data Characteristics, Types of Big Data, Big Data Architecture, Introduction to Map- Reduce and Hadoop; Distributed File System, HDFS. NOSQL: NOSQL and Query Optimization; Different NOSQL Products, Querying and Managing NOSQL; Indexing and Ordering Data Sets; NOSQL in Cloud.

Reference Books:

1. Computer Today, A. Ravichandran, Khanna Publishing House
2. Internet of Things, Jeeva Jose, Khanna Publishing House
3. Big Data and Hadoop, V.K. Jain, Khanna Publishing House
4. Data Sciences and Analytics, V.K. Jain, Khanna Publishing House

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
INTRODUCTION TO PYTHON
Paper Code: PCC-WD-602

Semester:6th	Sessional: 25Marks
Stream: Web Development	Theory: 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0	Duration of Exam: 3Hours

Course Objectives:

1. To learn and understand Python programming basics and paradigm.
2. To learn and understand python looping, control statements and string manipulations.
3. Students should be made familiar with the concepts of GUI controls and designing GUI applications.
4. To learn and know the concepts of file handling, exception handling and database connectivity

Course Contents:

UNIT-I

Familiarization with the basics of Python programming: a simple "hello world"program, process of writing a program, running it, and print statements; simple datatypes: integer, float, string. Introduce the notion of a variable, and methods to manipulate it (concept of L-value and R-value even if not taught explicitly)

UNIT-II

Knowledge of data types and operators: accepting input from the console, assignment statement, expressions, operators and their precedence.

Conditional statements: if, if-else, if-elif-else; simple programs: e.g.: absolute value, sort numbers, and divisibility.

UNIT-III

Notion of iterative computation and control flow: for, while, flowcharts, decision trees and pseudo code; write a lot of programs: interest calculation, primarily testing, and factorials.

Idea of debugging: errors and exceptions; debugging: pdb, break points.

UNIT-IV

Lists, tuples and dictionary: finding the maximum, minimum, mean; linear search on• list/tuple of numbers, and counting the frequency of elements in a list using a dictionary. Introduce the notion of accessing elements in a collection using numbers and names.

Sorting algorithm: bubble and insertion sort; count the number of operations while sorting. Strings: compare, concat, substring; notion of states and transitions using state transition diagrams.

Reference Books:

1. Introduction to Computing and Problem Solving With Python, Jeeva Jose, Khanna Publishing House
2. Taming Python by Programming, Jeeva Jose, Khanna Publishing House

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
ENTREPRENEURSHIP
Paper Code: BSC-601

Semester:6th	Sessional: 25Marks
Stream: Web Development	Theory: 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

- Sketching an apt business plan
- Hiring and retaining a skilled workforce
- Financial stability
- Aligning marketing and sales

Course Contents

Unit-1:

Entrepreneurship and entrepreneur: Entrepreneurship concept and process, Entrepreneur, Essential Characteristics of a good Entrepreneur, Types of entrepreneur, Industrial Policy, Classification of industries- Micro, small scale , Medium scale, Large scale, Product identification/ selection, Site selection, Plant layout, Pre-market survey.

Unit-2:

Entrepreneurship Support System and Start-ups: Introduction to start-up's, Role of District Industries Centre in setting up industry, Function of NSIC, SISI, NISIET, NRDC, SSIC, SIDO, NMTC, KVIC, RSMML, Role of state finance corporation, state electricity corporations, pollution control board, BIS, I.S.O. etc.

Unit-3

Introduction to Tax System, and Acts: Idea of income tax, Goods and Services Tax and custom duty, Introduction to Industrial Acts, factory Act, Workmen's Compensation Act 1923, Apprentices Act 1961, Environmental Protection Act 1986

Unit-4:

Project Report Preparation: Procedure of preparing a project report, Format of project report, Preparation of project report, Introduction to ISO: 9000 Series of Quality System

Key Learning Outcomes

- Students will be aware about the concepts of entrepreneurship development and significance of entrepreneurship in economic development.
- It will help students to know about various acts related to an industry.
- Students will be able to prepare project report.
- They will be able to know the support available from Govt. to start a new venture.

Reference Books

- 1. Khanka S.S., "Entrepreneurship Development" S.Chand.
- 2. Desai, A N. "Entrepreneur & Environment" Ashish, New Delhi.
- 3. Drucker, Peter. "Innovation and Entrepreneurship" Heinemann, London.
- 4. Jain Rajiv. "Planning a Small Scale Industry: A Guide to Entrepreneurs" S.S. Books, Delhi.
- 5. Kumar, S A. "Entrepreneurship in Small Industry" Discovery, New Delhi

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
PYTHON LAB
Paper Code: PCC-WD-603

Semester:6th Internal: 60 Marks

Stream: Web Development External: 40 Marks

L T P Total Credits

0 0 9 9 Total: 100 Marks

Hours Duration of Exam: 3

Course Contents::

1. Python program to add two numbers
2. Maximum of two numbers in Python
3. Python Program for factorial of a number
4. Python Program for simple interest
5. Python Program for compound interest
6. Python Program to check Armstrong Number
7. Python Program for Program to find area of a circle
8. Python program to print all Prime numbers in an Interval
9. Python program to check whether a number is Prime or not
10. Python Program for n-th Fibonacci number
11. Python Program for How to check if a given number is Fibonacci number?
12. Python Program for n\'th multiple of a number in Fibonacci Series
13. Program to print ASCII Value of a character
14. Python Program for Sum of squares of first n natural numbers
15. Python Program for cube sum of first n natural numbers

Array Programs:

1. Python Program to find sum of array
2. Python Program to find largest element in an array
3. Python Program for array rotation
4. Python Program for Reversal algorithm for array rotation
5. Python Program to Split the array and add the first part to the end
6. Python Program for Find reminder of array multiplication divided by n
7. Python Program to check if given array is Monotonic

List Programs:

1. Python program to interchange first and last elements in a list
2. Python program to swap two elements in a list
3. Python | Ways to find length of list
4. Python | Ways to check if element exists in list
5. Different ways to clear a list in Python
6. Python | Reversing a List
7. Python program to find sum of elements in list
8. Python | Multiply all numbers in the list
9. Python program to find smallest number in a list
10. Python program to find largest number in a list

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
Computer Network Security
Paper Code: PCC-WD-605

Semester:6th	Sessional: 25Marks
Stream: Web Development	Theory: 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To understand basics of Cryptography and Network Security
2. To be able to secure a message over insecure channel by various means.
3. To learn about how to maintain the Confidentiality, Integrity and Availability of a data
4. To understand various protocols for network security to protect against the threats in the networks.

Course Contents:

UNIT-I

Network Concept, Benefits of Network, Network classification (PAN, LAN, MAN, WAN), Peer to Peer, Client Server architecture, Transmission media: Guided & Unguided, Network Topologies. Networking terms: DNS, URL, client server architecture, TCP/IP, FTP, HTTP, HTTPS, SMTP, Telnet OSI and TCP/IP Models: Layers and their basic functions and Protocols, Comparison of OSI and TCP/IP. Networking Devices: Hubs, Switches, Routers, Bridges, Repeaters, Gateways and Modems, ADSL.

UNIT-II

Ethernet Networking: Half and Full-Duplex Ethernet, Ethernet at the Data Link Layer, Ethernet at the Physical Layer. Switching Technologies: layer-2 switching, address learning in layer-2 switches, network loop problems in layer-2 switched networks, Spanning-Tree Protocol, LAN switch types and working with layer-2 switches, Wireless LAN

UNIT- III

Internet layer Protocol: Internet Protocol, ICMP, ARP, RARP. IP Addressing: Different classes of IP addresses, Sub-netting for an internet work, Classless Addressing. Comparative study of IPv4 & IPv6. Introduction to Router Configuration. Introduction to Virtual LAN.

UNIT- IV

Transport Layer: Functions of transport layer, Difference between working of TCP and UDP. Application Layer: Domain Name System (DNS), Remote logging, Telnet, FTP, HTTP, HTTPS. Introduction to Network Security.

Key Learning Outcomes

After successful completion of the course, the learners would be able to

1. Provide security of the data over the network.
2. Do research in the emerging areas of cryptography and network security.
3. Implement various networking protocols.
4. Protect any network from the threats in the world.

Reference Books:

1. Information & Computer Security, Sarika Gupta, Khanna Publishing House
2. An Integrated Approach to Computer Networks, Bhavneet Sidhu, Khanna Publishing House

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
Introduction to AI
Paper Code: PCC-WD-604

Semester:6th	Sessional: 25Marks
Stream: Web Development	Theory: 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. Gain a historical perspective of AI and its foundations.
2. Become familiar with basic principles of AI toward problem solving, inference, perception, knowledge representation, and learning.
3. Investigate applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
4. Experience AI development tools such as an 'AI language', expert system shell, and/or data mining tool.

Course Content:

UNIT – I

Overview of A.I: Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success. Problems, problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem Heuristic search techniques : Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction

UNIT - II

Knowledge Representation: Definition and importance of knowledge, Knowledge representation, Various approaches used in knowledge representation, Issues in knowledge representation. Using Predicate Logic: Represent ting Simple Facts in logic, Representing instances and is-a relationship, Computable function and predicate.

UNIT - III

Natural language processing: Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing. Learning: Introduction learning, Rote learning, Learning by taking advice, Learning in problem solving, Learning from example-induction, Explanation based learning.

UNIT - IV

Expert System: Introduction, Representing using domain specific knowledge, Expert system shells. Knowledge acquisition: General concepts in knowledge acquisition, early work in Machine Learning, examples of Inductive Learners, computer vision, Robotics, overview of LISP- AI language.

Key Learning outcomes:

1) Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
2) Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
3) Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
4) Demonstrate profciency developing applications in an 'AI language', expert system shell, or data mining tool.

Reference Books:

1. Artificial Intelligence, Munish Chandra Trivedi, Khanna Publishing House

J.C. Bose University of Science & Technology, YMCA, Faridabad
(A Haryana State Government University)
(Established by Haryana State Legislative Act No. 21 of 2009 & Recognized by UGC Act 1956 u/s 22 to Confer Degrees)
Accredited 'A' Grade by NAAC

COMMUNITY COLLEGE OF SKILL DEVELOPMENT (CCSD)

Program B.Voc Web Development (program Code: 251)
Revised Scheme Course Index of the year 2020-2021(BOS Dated 18/05/2020)
Mapping of the course with the employability/Entrepreneurship/Skill Development

S.No	Course	Code	Skills Development	Entrepreneurship	Employability
1	BASICS OF OPERATING SYSTEM	PCC-WD-101	✓		✓
2	FUNDAMENTAL OF NETWORK AND SAFETY	PCC-WD-104	✓		✓
3	ENGINEERING CALCULATIONS	BSC-102	✓	✓	
4	COMMUNICATION SKILLS	BSC-101	✓	✓	
5	COMPUTER LAB	PCC-WD-106	✓	✓	✓
6	WEB DESIGNING	PCC-WD-203	✓	✓	✓
7	OBJECT ORIENTED PROGRAMMING	PCC-WD-205	✓	✓	✓
8	EMPLOYABILITY SKILLS	BSC-206	✓	✓	
9	ENGINEERING CALCULATIONS-II	BSC-202	✓	✓	
10	HTML LAB	PCC-WD-207	✓	✓	✓
11	COMPUTER LAB	PCC-WD-208	✓	✓	✓
12	SOFT SKILLS	BSC-301	✓	✓	
13	HTML AND CSS	PCC-WD-301	✓	✓	✓
14	COMPUTER GRAPHICS	PCC-WD-303	✓		✓
15	SOFTWARE ENGINEERING	PCC-WD-303	✓		✓
16	COMPUTER LAB	PCC-WD-304	✓	✓	✓
17	ON JOB TRANING	OJT-WD-402	✓	✓	✓
18	ON JOB TRANING	OJT-WD-501	✓	✓	✓
19	TECHNOLOGY TRENDS IN IT	PCC-WD-601	✓		✓
20	INTRODUCTION TO PYTHON	PCC-WD-602	✓		✓
21	ENTREPRENEURSHIP	BSC-601	✓	✓	
22	MINOR PROJECT	BSC-602	✓	✓	✓
23	PYTHON LAB	PCC-WD-603	✓	✓	✓

Principal, CCSD

Annexure – “C”

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD

COMMUNITY COLLEGE OF SKILL DEVELOPMENT

CURRICULAM FOR

B.VOC

WEB DEVELOPMENT
(2020-21)

1ST SEMESTER

1. Introduction

All India Council for Technical Education (AICTE) Ministry of HRD, Government of India has introduced Entrepreneurship oriented Skill development courses of B.Voc/D.Voc/Skill Diploma. These courses will be run by AICTE approved institutes by using available infrastructure and facilities. In these courses the institute will conduct general education content and sector specific skills will be imparted by Skill Knowledge Providers/ Training Providers/ Industries.

1.1 Key Features:

1. Objectives

    1. To provide judicious mix of skills relating to a profession and appropriate content of General Education.
    2. To ensure that the students have adequate knowledge and skills, so that they are work ready exit point of the programme.
    3. To provide flexibility to the students by means of pre-defined entry and multiple exit points.
    4. To integrate NSQF within the Diploma, undergraduate level of higher education to enhance employability of the students and meet industry requirements. Such student apart from meeting the needs of local and national industry are also expected to be equipped to become part of the global workforce.
    5. To provide vertical mobility to students admitted in such vocational courses.
    6. The certification levels will lead to Diploma/Advanced Diploma/B. Voc. Degree in Web Development and will be offered by respective affiliating University.Students may be awarded Level Certificate/Diploma/Advance Diploma /Degree as out-lined in the Table below:

Award	Duration after class X	Corresponding NSQF level
Diploma	3 Year	5
Advance Diploma	4 Years	6
B.Voc Degree	5 Years	7

2. Course Objectives

After successfully completing the vocational course, the student would have acquired relevant appropriate and adequate technical knowledge together with the professional skills and competencies in the field of Web Development so that he/she is properly equipped to take up gainful employment in this Vocation.

Thus he/she should have acquired Understanding of:

(a) The relevant basic concepts and principles in basic science subjects (Communication Skills and Mathematics) so that he/she is able to understand the different vocational subjects.

(b) The basic concepts in networking.

(c) The concepts, principles of working of basic computing devices and circuits.

3. Course Structure

The course will consist of combination of practice, theory and hands on skills in the IT sector.

4. Curriculum

- The curriculum in each of the years of the programme would be a suitable mix of general education and skill components.
- The focus of skill components shall be to equip students with appropriate knowledge, practice and attitude, to become work ready. The skill components will be relevany to the industry as per its requirements.
- The curriculam will necssarily embed within itself, National Occupational Standards (NOSs) of specific job roles withon the industry. This would enable the students to meet the learning outcomes specified in the NOSs.
- Adequate attention will be given in curriculam design to practical work, on the job training, development of student portfolios and project work.
- General Education Component:
- The general education component adhere to the normal senior secondary and university standards. It will emphasize and offer courses which provide holistic development. However, it will not exceed 40% of total curriculam. Adequate emphasis is given to language and communication skills.

SEMESTER – I SCHEME

Paper Code	Paper	L	T/P	Credits
PCC-WD-101	BASICS OF OPERATING SYSTEM	3	0	3
PCC-WD-104	FUNDAMENTALS OF NETWORK AND SAFETY	3	0	3
BSC-102	ENGINEERING CALCULATIONS	3	0	3
BSC-101	COMMUNICATION SKILLS	3	0	3
PCC-WD-106	COMPUTER WORKSHOP	0	18	18

Detailed Curriculum

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD

Community college of skill development

Basics of operating system

Paper Code: PCC - WD - 101

Semester: 1st
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional : 25 Marks
Theory: 75 Marks
Total: 100 Marks

Duration of Exam: 3 Hours

Course Objectives:

1. To learn the fundamentals of Operating Systems.
2. To learn the mechanisms of OS to handle processes.
3. To learn the mechanisms involved in memory management in contemporary OS.
4. To gain knowledge on file management aspects of Operating systems

Course Content:

Unit 1: Operating Systems: Concept of Operating Systems, Need of operating system, Types of Operating Systems, Services of operating system, Structure of an operating system, Functions of operating system.

Unit 2: Processes: Definition, Different states of a Process, Process Scheduling, Types of Schedulers, and Scheduling criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time. Scheduling algorithms, FCFS, SJF, Priority, RR, Multiprocessor scheduling.

Unit 3: Memory & File Management: Logical and Physical address space, Swapping, Contiguous Memory allocation, Virtual Memory, Paging, Segmentation. Concept of File, Access methods, Directory structure, File System structure, Allocation methods.

Unit 4: Study of various Operating Systems: Windows, Dos, Linux etc.

Key Learning Outcomes:

Candidates will be able to:

1. Create processes.
2. Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, and Response Time.
3. For a given specification of memory organization, develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time.
4. Design and implement file management system.

Reference Books:

1. Operating System Concepts by Silberchatz et al, 5th edition, 1998, AddisonWesley.
2. Modern Operating Systems by A. Tanenbaum, 1992, Prentice-Hall.
3. Operating Systems Internals and Design Principles by William Stallings,4th edition, 2001, Prentice Hall.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
Community college of skill development
Fundamentals of Network and Safety
Paper Code: PCC– WD - 104

Semester: 1st
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional : 25 Marks
Theory: 75 Marks
Total: 100 Marks

Duration of Exam: 3 Hours

Course Objectives:

1. To learn about computer networks and its various types.
2. To learn about underlying areas of web programming.
3. To learn about basics of internet.
4. To learn about various health and safety procedures.

Course Contents:

Unit 1 : Basics of Computer Networks : Introduction of computer network, need for networking, advantages of computer network, network topologies.Types of computer networks: LAN, MAN, WAN, (features, advantages and disadvantages), difference between LAN and WAN.

Unit 2 : Introduction to Internet : Introduction to Web browser, WWW, Searching Internet.Services of internet: E-mail, Social Internet Media and its benefits.

Unit 3 : Web Programming : Introduction to web programming, Basics of HTML: HTML tags, page structure, lists, tables, Introduction to CSS and Java Script.

Unit 4 : Managing Health and Safety : Importance of safety, Objectives of safety management, Hazards and its types, Health safety, Different types of breaches, Evacuation procedures, Medical assistance, Security policies and procedures.Government agencies in the areas of safety, health and security and their norms and services.

Key Learning Outcomes

Candidates will be able to:

1. Demonstrate basic computer networking concepts.
2. Operating a browser, searching the internet, managing mails and using social internet media.
3. Understand web programming.
4. Comply with organization's current health, safety and security policies and procedures.

Reference Books:

1. Sudhakshina Kundu, Fundamentals of Computer Networks.
2. Tenenbaum, Computer Networks.
3. Fundamentals of Web Development by Randy Connolly.
4. Industrial Safety Management by L.M Deshmukh, Tata Mcgraw Hill Publication.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
Community college of skill development
Communication Skills
Paper Code: BSC – 101

Semester: 1st
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional : 25 Marks
Theory: 75 Marks
Total: 100 Marks

Duration of Exam: 3 Hours

Course Objectives:

1. To discuss types of communication and their forms
2. To improve comprehension
3. To improve spoken English and ability to articulate ideas
4. To improve formal writing skills

Course Contents:

Unit 1 : Introduction to Communication : Meaning of communication, Importance and function of communication, Types of communication; language of communication; advantages and disadvantages, Barriers to Communication.

Unit 2 : Grammar : Parts of speech, Articles, Tenses, Formation of Sentences, Active and Passive Voice, Direct and Indirect speech.

Unit 3 : Writing and Comprehension : Comprehension, Composition, Letter writing, Translation, Paraphrasing.

Unit 4 : Practical Communication : 7 Cs of Communication, Grice's Cooperative Principle, Group Discussions; Public Speaking; Facing Interviews.

Key Learning Outcome:

Candidate will be able to:

1. To learn about communication process, and ways to make communication effective by giving attention to all elements involved.
2. To improve grammar and gain confidence by enhancing their abilities to articulate their ideas.
3. To acquire better writing skills in formal communication.
4. To be able to revise documents for fruitful reading and comprehension.

Reference Books:

1. 1. Wren and Martin. High School English Grammar and Composition. New Delhi: RRP, 2007
2. 2. Murphy, Raymond. Essential English Grammar . New Delhi: Cambridge, 2017
3. 3. Malhotra, Prerna and Halder, Deb. Communication Skill s: Theory and Practice. New Delhi: M.S. Indian

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
Community college of skill development
Computer Workshop
Paper Code: PCC- WD - 108

Semester: 1st
Stream: Web Development
L T P Total Credits
0 0 18 18

Internal: 30 Marks
External: 20 Marks
Total: 50 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. To be familiar with syntax and structure of C-Programming
2. To learn problem solving techniques using C.
3. To be familiar with different data types, Operators and Expressions in C.
4. To be familiar with formatted and unformatted I/O in C with preprocessor directives.
5. To understand the programming using Loop & nested loop Statements (for, while, do-while).
6. To understand programming using different dimensions of Array.
7. To understand programming with Pointer, String and Function call by reference.

Course Contents:

C-Programming

1. Write a program to display "hello world" in C.
2. Write a program to add two numbers (5&7) and display its sum.
3. Write a program to multiply two numbers (10&8) and display its product.
4. Write a program to calculate area of a circle having its radius (r=5).
5. Write a program to calculate area of an ellipse having its axes (minor=4cm, major=6cm).
6. Write a program to calculate simple interest for a given P=4000, T=2, R=5.5. (I = P*T*R/100)
7. Write a program to declare two integer and one float variables then initialize them to 10, 15, and 12.6. Also print the variable values in the screen.
8. Write a C program to prompt the user to input 3 integer values and print these values in forward and reversed order.
9. Write a program to calculate simple and compound interest.
10. Write a program to swap two variables values with and without using third variables
11. Write a program to check odd or even number
    (a) using modulus operator
    (b) using bitwise operator
    (c) without using bitwise and modulus operator
    (d) using conditional operator.
12. Print the value of y for given x=2 & z=4 and analyze the output.
    a. y = x++ + ++x;
    b. y= ++x + ++x;
    c. y= ++x + ++x + ++x;
    d. y = x>z;
    e. y= x>z? x:z;
    f. y = x&z;
    g. y= x>>2 + z<<1;
13. Write a program to print the size of char, float, double and long double data types in C.
14. Write a program to produce the output as shown below:

x	y	expressions	results
6	3	x=y+3	x=6
6	3	x=y-2	x=1
6	3	x=y*5	x=15
6	3	x=x/y	x=2

6 | 3 | x=x%y | x=0

15. Demonstrate the differences among getch(), getche(), getchar(). Demonstrate the difference between scanf() & gets(), printf() & puts().
16. Write a program to check whether input alphabet is vowel or not using if-else and switch statement.
17. Write a program that asks a number and test the number whether it is multiple of 5 or not.
18. Write a program to check whether the entered year is leap year or not (a year is leap if it is divisible by 4 and divisible by 100 or 400.)
19. Write a program to input two integer numbers and display the sum of even numbers between these two input numbers.
20. Write a program to find GCD (greates common divisor or HCF) and LCM (least common multiple) of two numbers.
21. Write a program to display Fibonacci series of last term up to 300.
22. Write a program to enter 10 floating numbers in an array and display it.
23. Write a program to initialize one dimensional array of size 8 and display the sum and average of array elements.
24. Write a program to find biggest among three numbers using pointer.
25. Write a program to find the sum of all the elements of an array using pointers.
26. Write a program to swap value of two variables using pointer.
27. Write a program to read a sentence and count the number of characters &words in that sentence.
28. Write a program to copy one string to another string with and without using string handling function.
29. Write a program to concatenate two strings.
30. Write a program to compare two strings.

SEMESTER – II SCHEME

Paper Code	Paper	L	T/P	Credits
PCC-WD-203	WEB DESIGNING	3	0	3
PCC-WD-205	OBJECT ORIENTED PROGRAMMING	3	0	3
BSC-206	EMPLOYABILITY SKILLS	3	0	3
BSC-202	ENGINEERING CALCULATIONS - II	3	0	3
PCC-WD-207	HTML LAB	0	6	6
PCC-WD-208	COMPUTER LAB	0	12	12

Detailed Curriculum

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
WEB DESIGNING - HTML AND CSS
Paper Code: PCC-WD-203

Semester: 2nd | Sessional: 25Marks
Stream: Web Development | Theory: 75 Marks
L T P Total Credits | Total: 100 Marks
3 0 0 3 | Duration of Exam: 3 Hours

Course Objectives:

1. Understand the principles of creating an effective web page
2. Develop skills in analyzing the usability of a web site.
3. Understand how to plan and conduct user research related to web usability.
4. Learn the language of the web: HTML and CSS.

Course Contents:

Unit-I: Web Design Principles : Basic Principles involved in developing a web site, Planning process, Five Golden rules of Web Designing, World Wide Web, Why create a web site, Web Standards

Unit-2: Introduction to HTML : What is HTML, HTML Documents, Basic structure of an HTML document, Creating an HTML document, Mark up Tags, Heading-Paragraphs, Line Breaks, HTML Tags.Elements of HTML: Introduction to elements of HTML, Working with Text, Working with Lists, Tables and Frames; Working with Hyperlinks, Images and Multimedia; Working with Forms and controls.

Unit- 4: Introduction to Cascading Style Sheets: Concept of CSS, Creating Style Sheet, CSS Properties, CSS Styling(Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables, CSS Id and Class, Box Model(Introduction, Border properties, Padding Properties, Margin properties), CSS Color, Creating page Layout and Site Designs.

Unit – 5 JavaScript introduction : What is JavaScript,Understanding Events, JavaScript Example, External JavaScript

Key Learning Outcomes

Candidates will be able to:

1. Discover how does web works really, what makes web sites work.
2. Employ fundamental computer theory to basic programming techniques.
3. Create an Information Architecture document for a web site.
4. How to and where to start research, planning for website
5. Use fundamental skills to maintain web server services required to host a website.

Reference Books:

1. Satish Jain, Ambrish K. Rai and M. Geetha, Web Designing and Development, BPB Publications.
2. Hirdesh Bhardwaj, Web Designing.
3. Jon Duckett, HTML & CSS: Design and Build Web Sites

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
ENGINEERING CALCULATIONS
Paper Code:BSC-202

Semester: 2nd
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional: 25Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives

1. To familiarize the prospective engineers with Basics of mathematics
2. To understand fundamental arithmetical operations.
3. To learn Unit systems, Fractions and Decimals, roots, percentage.
4. To have Knowledge of differential quantities

Course Contents

UNIT-I Complex number: Definition of Complex Number, Operations on Complex Number (Add., Sub., Multiplication, Division), Conjugate Complex Number, Modulus and Amplitude of a Complex Number, Polar form of a Complex Number.

Unit -II Matrices and Determinants: Definition and Properties of Determinants, Definition and Types of Matrix, Transpose of a Matrix, Symmetric, Skew Symmetric Matrices, Orthogonal matrices, Hermitian and Skew Hermitian, Minors and Cofactors, Adjoint and Inverse of a Matrix, Cramer's Rule, Solution of Simultaneous Linear Equations by Inverse Matrix Method, Characteristic Matrix, Characteristic Equation, Eigen Values & Vectors, Cayley Hamilton Theorem (verification only).

Unit - III Differentiation: Introduction to Derivatives, Product Rule, Quotient Rule, Chain Rule, Derivatives of Algebraic Function, Derivative of Trigonometric Functions, partial derivative.

Unit - IV Statistics: Measures of Dispersion: Range, Mean deviation, variance and standard deviation of ungrouped/grouped data. Analysis of frequency distributions with equal means but different variances.

Course Outcomes:

1. Students will learn about complex number.
2. Students will learn about matrix and determinants.
3. Students will able to deal with derivative Problems.
4. Students will able solve and learn integration.

Reference Books:

1. Mathematics Book by R.D Sharma
2. Advanced Engineering Mathematics By Jain Rk.
3. A Basic Course in Mathematics By Nabjyoti Dutta.
4. Skills in Mathematics By Amit M Aggarwal.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
OBJECT ORIENTED PROGRAMMING
Paper Code:PCC-WD-205

Semester: 2nd
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional: 25Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. To be familiar with the main features of the C++ language.
2. Be able to understand C++ program to solve a well specified problem.
3. Understand a C++ syntax written by someone else.

Course Contents:

Unit-1: Concepts of OOP
Introduction OOP, Procedural Vs. Object Oriented Programming, Principles of OOP, Benefits and applications of OOP.
Unit-2: C++ Basics
Overview, Program structure, namespace, identifiers, variables, constants, enum, operators, typecasting, control structures.
Unit-3: C++ Functions
Simple functions, Call and Return by reference, Inline functions, Macro Vs. Inline functions, Overloading of functions, default arguments, friend functions, virtual functions.
Unit-4: Objects and Classes
Basics of object and class in C++, Private and public members, static data and function members, constructors and their types, destructors, operator overloading, type conversion.
Unit-5: Inheritance
Concept of Inheritance, types of inheritance: single, multiple, multilevel, hierarchical, hybrid, protected members, overriding, virtual base class.
Unit-6: Polymorphism
Pointers in C++, Pointes and Objects, this pointer, virtual and pure virtual functions, Implementing polymorphism.
Unit-7: I/O and File Management
Concept of streams, cin and cout objects, C++ stream classes, Unformatted and formatted I/O, manipulators, File stream, C++ File stream classes, File management functions, File modes, Binary and random Files.
Unit-8: Templates, Exceptions and STL
What is template? function templates and class templates, Introduction to exception, try-catch- throw, multiple catch, catch all, rethrowing exception, implementing user defined exceptions, Overview and use of Standard Template Library.

Course Outcomes:

1. Describe the important concepts of object oriented programming like object and class, Encapsulation, inheritance and polymorphism.
2. Write the skeleton of C++ program.
3. Write the simple C++ programs using the variables, operators, control structures, functions.
4. Write the simple object oriented programs in C++ using objects and classes, inheritence, file management, exceptions etc..

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
EMPLOYABILITY SKILLS
Paper Code:BSC-206

Semester: 2nd
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional: 25Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. To discuss types of communication and their forms.
2. To improve comprehension.
3. To improve spoken English and ability to articulate ideas
4. To improve formal writing skills

Course Contents:

Unit 01

Communication skill: Oral and written communication Listening skills, written communications, motivation, ethics, Time management, facing job interviews, behaviour skills, Assessing oneself.

Unit -02

English Literacy – Pronunciation, listening speaking and reading: - greetings and introductions describing people, Telephone skills, Office Hospitality, Describing things.

Unit -03

Entrepreneurship skills- 1: - Scope and advantage of self-employment, Entrepreneurial skills, values and attitudes, Characterchicts of Successful Entrepreneurs, Identification of entrepreneurs bu self-assessment, Micro, small and medium enterprises, Creativity and idea generation.

Unit -04

Entrepreneurship Skills – 2: - Understanding Consumer, Market Survey: Scope & Influence of publicity and advertisement, Accounting and analysis, Assistance provided by Central and State Govt. Organisations, Project formation, feasibility and profitability estimates, Filling up a Preliminary Project Report Proforma, Investment procedure-loan procurement.

Course Outcome:

1. To learn about communication process and ways to make communication effective by giving attention to all elements involved.
2. To improve grammar and gain confidence by enhancing their abilities to articulate their ideas.
3. To acquire better writing skills in formal communication.
4. To be able to revise documents for fruitful reading and comprehension

Reference books:

1. Wren and Martin. High School English Grammar and Composition. New Delhi: RRP, 2007
2. Murphy, Raymond. Essential English Grammar. New Delhi: Cambridge, 2017
3. Malhotra, Prerna and Halder, Deb. Communication Skills: Theory and Practice.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
HTML LAB
Paper Code:PCC-WD-207

Semester: 1st	Internal: 30 Marks
Stream: Web Development	External: 20 Marks
L T P Total Credits	Total: 50 Marks
0 0 6 6	Duration of Exam: 3 Hours

Course Objectives:

1. To Acquire knowledge and Skills for creation of Web Site considering both client- and server- side Programming.
2. To create Web application using tools and techniques used in industry.
3. To be well versed with XML and web services Technologies.
4. To be familiarized with open source Frameworks for Software Development .

Course Contents:

1. Generic awareness about Hyper Text Markup Language (HTML).
2. Designing of websites.
3. Basics of HTML tags.
4. Functional knowledge of web hosting
5. Basics of Networking

Course Outcomes:

` 1. Design a basic web site using HTML5 and CSS3 to demonstrate responsive web design.
2. Develop simple web application using server side PHP programing and Database Connectivity using MySQL.
3. Build well-formed XML Document and implement Web Service using Java.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
COMPUTER LAB
Paper Code:PCC-WD-208

Semester: 2nd	Internal: 30 Marks
Stream: Web Development	External: 20 Marks
L T P Total Credits	Total: 50 Marks
0 0 12 12	Duration of Exam: 3 Hours

Course Objectives:

1. To be familiar with the main features of the C++ language.
2. Be able to write a C++ program to solve a well specified problem.
3. Understand a C++ program written by someone else.
4. Be able to debug and test C++ programs;
5. Understand how to read C++ doc library documentation and reuse library code.
6. To understand the features of object oriented principles and be familiar with virtual functions, templates and exception handling.
7. To develop applications using C++.

Course Contents:

1. Write a C++ program to find the largest of three numbers using inline function.
2. Write a C++ program to sort an array of integer in ascending order using a function called exchange( ) which accepts two integer arguments by reference.
3. Write a C++ program to implement function overloading in order to compute power(m,n) where
   i) m is double and n is int
   ii) m and n are int.
4. Create a 'DISTANCE' class with : - feet and inches as data members - member function to input distance - member function to output distance - member function to add two distance objects Write a main function to create objects of DISTANCE class. Input two distances and output the sum.
5. Create a class called 'EMPLOYEE' that has - EMPCODE and EMPNAME as data members - member function getdata( ) to input data - member function display( ) to output data Write a main function to create EMP, an array of EMPLOYEE objects. Accept and display the details of at least 6 employees.
6. Create a class called 'TIME' that has - three integer data members for hours, minutes and seconds - constructor to initialize the object to zero - constructor to initialize the object to some constant value - member function to add two TIME objects - member function to display time in HH:MM:SS format Write a main function to create two TIME objects, add them and display the result in HH:MM:SS format.
7. Create a class 'COMPLEX' to hold a complex number. Write a friend function to add two complex numbers. Write a main function to add two COMPLEX objects.
8. Create a 'MATRIX' class of size m X n. Overload the‘+’ operator to add two MATRIX objects. Write a main function to implement it.
9. Derive a class ‘MAT’ from MATRIX class created in program No. 8. Add a member function to overload ‘*’ operator to multiply two objects. (Single Inheritance)
10. Write a c++ program to illustrate multilevel inheritance.
11. Write a c++ program to illustrate multiple inheritance
12. Create a 'STRING' class which overloads ‘ = = ' operator to compare two STRING objects.
13. Write a C++ program to illustrate ‘this’ pointer and pointers to derived classes.
14. Create a base class called 'SHAPE' having - two data members of type double - member function get-data( ) to initialize base class data members - pure virtual member function display-area( ) to compute and display the area of the geometrical object. Derive two specific classes 'TRIANGLE' and 'RECTANGLE' from the base class. Using these three classes design a program that will accept dimension of a triangle / rectangle interactively and display the area.

15. Write a C++ program to read a list containing item name, item code and cost interactively and display the data in a tabular format as shown below:

NAME	CODE	COST

16. Design your own manipulator to provide the following output specification for printing money value:
    1) 10 columns width
    2) The character '$' at the beginning
    3) Showing '+' sign.
    4) Two digits precision
    5) Filling of unused spaces with ' * '
    6) Trailing zeros shown

17. Write a C++ program that uses a single file for both reading and writing the data.
18. A file contains a list of names and telephone numbers in the following form:
    Name Tel. No.
    Write a C++ program to read the file and output the list in the tabular format. The name should be left-justified and numbers right-justified. Use a class object to store each set of data.
19. Write an interactive, menu-driven program that will access the file created in program No.17 and implement the following tasks:
    i) To determine the telephone numbers of the specified person.
    ii) To determine the name if a telephone number is given.
    iii) To update the telephone number whenever there is a change.
20. Write a C++ program that displays the size (in bytes) of a given file. The name of the file is specified as command line argument.
21. Define a function template for finding the minimum value contained in an array. Write main( ) function to find the minimum value of integer array and minimum value of floating point numbers in an array.
22. Write a class template to represent a generic vector. Include member functions to perform the following tasks:
    1) To create the vector.
    2) To modify the value of a given element.
    3) To multiply the vector by a scalar value.
    4) To display the vector in the form (10, 20, 30,…..)

Key Learning Outcomes
Candidates will be able to:

1. Understand and use the basic programming constructs of C/C++
2. Manipulate various C/C++ datatypes, such as arrays, strings, and pointers
3. Isolate and fix common errors in C++ programs
4. Use memory appropriately, including proper allocation/deallocation procedures
5. Apply object-oriented approaches to software problems in C++
6. Write C++ programs using the above skills

SEMESTER – III SCHEME

Paper Code	Paper	L	T/P	Credits
BSC-301	SOFT SKILLS	3	0	3
PCC-WD-301	HTML AND CSS	3	0	3
PCC-WD-302	COMPUTER GRAPHICS	3	0	3
PCC-WD-303	SOFTWARE ENGINEERING	3	0	3
PCC-WD-304	COMPUTER LAB	0	12	12

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
HTML & CSS
Paper Code: PCC-WD-301

Semester: 3rd
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional: 25Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. Understand the principles of creating an effective web page
2. Develop skills in analyzing the usability of a web site.
3. Understand how to plan and conduct user research related to web usability.
4. Learn the language of the web: HTML and CSS.

Course Content

UNIT-1: Introduction: History of HTML, HTML Tags and Attributes?, HTML Tag vs. Element, HTML Attributes. Basic Formatting Tags: HTML Basic Tags,HTML Formatting Tags,HTML Color Coding. Lists: Unordered Lists, Ordered Lists, Definition List. Images and HTML-Hyperlinks: Image and Image Mapping, URL - Uniform Resource Locator, URL Encoding

UNIT-II : HTML-Table: <table>, <th>, <tr>, <td>. HTML-Iframe: Attributes Using, Iframe as the Target. HTML-Form: <input>, <textarea>,<button>,<select>,<label> etc. HTML-Headers: Title,Base,Link,Style sheets,Script,Meta.

UNIT-III: CSS2-Introduction: Benefits of CSS,CSS Versions History,CSS Syntax,External Style Sheet using <link>,Multiple Style Sheets,Value Lengths and Percentages. CSS2-Syntax: CSS Syntax, single Style Sheets, Multiple Style Sheets,Value Lengths and Percentages. CSS2-Selectors: ID Selectors, Class Selectors, Grouping Selectors, Universal Selector, Descendant / Child Selectors, Attribute Selectors, CSS – Pseudo Classes. Color Background Cursor: background-image, background-repeat, background-position, CSS Cursor.

UNIT-IV*:* CSS2-Text Fonts:color, background-color, text-decoration, text-align, vertical-align, text-indent, text-transform, white-space, letter-spacing, word-spacing, line-height, font-family, font-size, font-style,font-variant, font-weight. CSS2-Lists Tables: list-style-type, list-style-position, list-style-image, list-style, CSS Tables : 1. border 2.width & height 3.text-align 4.vertical-align 5.padding 6.color CSS2-Box Model: Borders & Outline,Margin & Padding, Height and width, CSS Dimensions. CSS2-Display Positioning: CSS Visibility, CSS Display, CSS Scrollbars, CSS Positioning- 1.Static Positioning, 2.Fixed Positioning, 3.Relative Positioning

Key Learning Outcomes

Candidates will be able to:

1. Discover how does web works really, what makes web sites work.
2. Employ fundamental computer theory to basic programming techniques.
3. Create an Information Architecture document for a web site.
4. How to and where to start research, planning for website
5. Use fundamental skills to maintain web server services required to host a website.

Reference Books:

1. Satish Jain, Ambrish K. Rai and M. Geetha, Web Designing and Development, BPB Publications.
2. Hirdesh Bhardwaj, Web Designing.
3. Jon Duckett, HTML & CSS: Design and Build Web Sites

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
COMPUTER GRAPHICS
Paper Code:BSC-206

Semester: 3rd
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional: 25Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1. Gain knowledge about graphics hardware devices and software used
2. Understand the two dimensional graphics and their transformations.
3. Understand the three dimensional graphics and their transformations.
4. Appreciate illumination and color models.
5. Be familiar with understand clipping techniques.

Course Content:

UNIT-1 Introduction to Computer Graphics: What is Computer Graphics, Computer Graphics Applications, Computer Graphics Hardware and software, two dimensional Graphics Primitives: Points and Lines, Line drawing algorithms: DDA, Bresenham's; Circle drawing algorithms: Using polar coordinates, Bresenham's circle drawing, midpoint circle drawing algorithm; Filled area algorithms: Scanline: Polygon filling algorithm, boundary filled algorithm. Two/Three Dimensional Viewing: The 2-D viewing pipeline, windows, viewports, window to view port mapping; Clipping: point, clipping line (algorithms):- 4 bit code algorithm, Sutherland-Cohen algorithm.

UNIT-2 Polygon clipping algorithm: Sutherland-Hodgeman polygon clipping algorithm. Two dimensional transformations: transformations, translation, scaling, rotation, reflection, composite transformation. Three-dimensional transformations: Three dimensional graphics concept, Matrix representation of 3-D Transformations, Composition of 3-D transformation.

UNIT-3 Viewing in 3D: Projections, types of projections, Hidden surface removal: Introduction to hidden surface removal. The Z- buffer algorithm, scanline algorithm, area sub-division algorithm.

UNIT-4: Illumination, shading, image manipulation: Illumination models, shading models for polygons, shadows, transparency. What is an image? Filtering, image processing, geometric transformation of images.

Key Learning Outcomes:

1. At the end of the course, the student should be able to:
2. Design two dimensional graphics.
3. Apply two dimensional transformations.
4. Design three dimensional graphics.
5. Apply Illumination and color models.

Reference Books:

1. Donald Hearn and M. Pauline Baker, Warren Carithers,"Computer Graphics With Open GL", 4th Edition, Pearson Education, 2010.
2. Jeffrey McConnell, "Computer Graphics: Theory into Practice", Jones and Bartlett Publishers, 2006.
3. Hill F S Jr., "Computer Graphics", Maxwell Macmillan" , 1990.
4. Peter Shirley, Michael Ashikhmin, Michael Gleicher, Stephen R Marschner, Erik Reinhard, KelvinSung, and AK Peters, Fundamental of Computer Graphics, CRC Press, 2010.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
SOFTWARE ENGINEERING
Paper Code: PCC-WD-302

Semester: 3rd
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional: 25Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives:

1 Basic understanding of software product,
2 software design and development process
3 software project management and design complexities

Course Contents:

UNIT-1 Software Overview: Definitions, Software Evolution & its laws, E-Type Software Evolution, Software Paradigm, Need of Software Engineering, Characteristics of Good Software.

Software Development Life Cycle: SDLC Activities & Software Development Paradigm. Software Project Management: need of software project management, Software Project manager, Software Management Activities, Project Planning, Scope Management, Project Estimation & its Techniques. Project Scheduling, Resource Management, Project Risk Management, Project Execution & Monitoring, Project Communication Management, Configuration Management, Project Management Tools.

UNIT-2 Software Requirements: Requirement Engineering, Requirement Engineering Process, Requirement Elicitation Process, Requirement Elicitation Techniques, Software Requirements Characteristics Software Requirements, User Interface Requirements, Software System Analyst Software Metrics and Measures.

Software Design Basics: Software Design Levels, Modularization, Concurrency, Coupling and Cohesion, Design Verification.

UNIT-3 Software Analysis and Design Tools: Data Flow Diagram, Structure Charts, HIPO Diagram, Structured English, Pseudo-Code, Decision Tables, Entity-Relationship Model, Data Dictionary

Software Design Strategies: Structured Design, Function Oriented Design, Object Oriented Design, Software Design Approaches.

UNIT-4 Software User Interface Design: Command Line Interface (CLI), Graphical User Interface, User Interface Design Activities, GUI Implementation Tools

Software Design Complexity: Halstead's Complexity Measures, Cyclomatic Complexity Measures, Function Point.

Software Implementation: Structured Programming, Functional Programming, Programming Style, Software Documentation, Software Implementation Challenges

Software Testing Overview: Software Validation, Software Verification, Manual Vs Automated Testing, Testing Approaches, Testing Levels, Testing Documentation, Testing Vs. Quality Control & Assurance and Audit.

Key Learning Outcome:

1 Identify the key activities in managing a software project.
2 Compare different process models.
3 Concepts of requirements engineering and Analysis Modelling.
4 Apply systematic procedure for software design and deployment.
5 Compare and contrast the various testing and maintenance

Reference Books:

1. Software Engineering – A Practitioner's Approach, Roger S. Pressman, 1996, MGH.
2. Fundamentals of software Engineering, Rajib Mall, PHI
3. Software Engineering by Ian sommerville, Pearson Edu, 5th edition, 1999, AW,

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
SOFT SKILLS
Paper Code:BSC-301

Semester: 3rd
Stream: Web Development
L T P Total Credits
3 0 0 3

Sessional: 25Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Course Objectives

1 To help the students in building interpersonal skills.
2 To develop skill to communicate clearly.
3 To enhance team building and time management skills.
4 To learn active listening and responding skills.

Course Contents

UNIT 1: GRAMMAR AND VOCABULARY

1.Tenses, 2. Subject–verb agreement. 3. Sentence Analysis: Simple, Compound and Complex sentences. 4. Phrases: Adjective, Adverb and Noun Phrase, 5. Clauses: Adjective, Adverb and Noun Phrase. 6. Voice, Narration, Gerund, Participle.

UNIT 2: ORAL COMMUNICATION

1. Listening Skill – Active listening, Barriers to active listening. 2. Speaking Skill-Stress patterns in English, 3. Questioning skills, 4. Barriers in Speaking 5. Reading Skill-Skimming, Scanning, Intensive reading, 6. linking devices in a text, 7. Different versions of a story/ incident.

UNIT 3: WRITING SKILLS

Letter writing, Business letters • Application letters • Covering letters • Report writing o Academic report o Business report o Technical report o Technical project report • Job Application and Resume writing

UNIT- IV: SOFT SKILLS

1.Body Language– Gesture, posture, facial expression. 2. Group Discussion– Giving up of PREP, REP Technique. 3. Presentation Skills: a. (i) How to make power point presentation b. (ii) Body language during presentation 4. Resume writing: Cover letter, career objective, Resume writing (tailor made) 5. Interview Skills: Stress Management, Answering skills.

UNIT- 5: STRESS AND TIME MANAGEMENT

Introduction • Stress In Today's Time • Identifying The Stress Source • Signs Of Stress • Ways To Cope With Stress • Healthier Ways To Deal With Stress • Time Management • Prioritize Your Work • Smart Work • Four Ds Of Decision Taking.

Key Learning Outcomes:

1 Self-Awareness, Personal Development, and Life Skills
2 Leadership and Communication
3 Social Justice and Responsibility

Reference books:

1. Advanced English Usage: Quirk & Greenbaum; Pearson Education.
2. Developing Communication Skills: Banerjee Meera & Mohan Krishna; Macmillan Publications, 1990.
3. Personality Development and Group Discussions by Barun K. Mitra, Oxford University Press

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
COMPUTER LAB
Paper Code: PCC-WD-304

Semester: 3rd	Internal : 30 Marks
Stream: Web Development	External: 20 Marks
L T P Total Credits	Total: 50 Marks
0 0 0 12	Duration of Exam: 3 Hours

Course Objectives:

1. Understand the principles of creating an effective web page
2. Develop skills in analyzing the usability of a web site.
3. Understand how to plan and conduct user research related to web usability.
4. Learn the language of the web: HTML and CSS.

List of Practicals:

1. A Program to illustrate body and pre tags
2. A Program to illustrate text Font tag
3. A Program to illustrate comment,h1….h6, and div tag
4. A Program to illustrate text formatting tags
5. A Program to illustrate Order List tag
6. A Program to illustrate Unorder List tag
7. A Program to illustrate Nested and Definition tag
8. A Program to illustrate Img tag
9. A Program to illustrate Hyper Link tag (Anchor tag)
10. A Program to illustrate Table tag
11. A Program to illustrate Frame tag
12. A Program to illustrate Form tag
13. A Program to illustrate Class & ID selector in style tag.
14. A Program to illustrate CSS (cascading style sheet)
15. A Program to illustrate External CSS in web Page

SEMESTER – IV SCHEME

S.NO.	PAPER CODE	SUBJECT	TEACHING SCHEDULE	EXAMINATION SCHEDULE (MARKS)		TOTAL MARKS	CREDITS
1	PCC-WD-401	ON-JOB TRAINING	8 hours per day for one semester	200	300	500	30

Procedure for Annual Examination and continuous Assessment

(A) Annual Exams Marks

1. Project Evaluation 50 Marks
2. Project Seminar 50 Marks
3. Project Viva 100 marks

(B) Continuous Assessment Marks

1. Assessment by Institute faculty 100 Marks
2. Assessment by Industrial Guide 150 Marks
3. Conduct Marks 50 Marks

Total 500 Marks

SEMESTER – V SCHEME

S.NO.	PAPER CODE	SUBJECT	TEACHING SCHEDULE	EXAMINATION SCHEDULE (MARKS)		TOTAL MARKS	CREDITS
1	OJT-WD-501	ON-JOB TRAINING	8 hours per day for one semester	200	300	500	30

Procedure for Annual Examination and continuous Assessment

(A) Annual Exams Marks

1. Project Evaluation 50 Marks
2. Project Seminar 50 Marks
3. Project Viva 100 marks

(B) Continuous Assessment Marks

1. Assessment by Institute faculty 100 Marks
2. Assessment by Industrial Guide 150 Marks
3. Conduct Marks 50 Marks

Total 500 Marks

SEMESTER – VI

SCHEME

Paper Code	Paper	L	T/P	Credits
PCC-WD-602	INTRODUCTION TO PYTHON	3	0	3
BSC-601	ENTREPRENEURSHIP	3	0	9
BSC-602	MINOR PROJECT	0	12	12
PCC-WD-603	PYTHONLAB	0	09	09
Elective Courses : Select any one				
PCC-WD-601	TECHNOLOGY TRENDS IN IT	3	0	3
PCC-WD-604	INTRODUCTION TO AI	3	0	3
PCC-WD-605	COMPUTER NETWORK SECURITY	3	0	3

Detailed Curriculum

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
TECHNOLOGY TRENDS IN IT
Paper Code: PCC-WD-601

Semester:6th	Sessional: 25Marks
Stream: Web Development	Theory: 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	
	Duration of Exam: 3 Hours

Course Objectives:

1. Student will be able to learn the basics of IOT.
2. Student will be able to analyse basic protocols of wireless and MAC.
3. Students will get familiar with web of things.
4. Students will get basic knowledge of resource management.

Course Contents:

Unit-I

Internet of Things (IoT) – Introduction to IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models &APIs ,IoT& M2M Machine to Machine, Difference between IoT and M2M, Software define Network, Challenges in IoT(Design ,Development, Security), Wireless medium access issues, MAC protocol survey, Survey routing protocols, Sensor deployment & Node discovery, Data aggregation & dissemination.

Unit-II

Internet of Things (IoT): Web of Things vs Internet of things, two pillars of web, Architecture and standardization of IoT, Unified multitier-WoT architecture, WoT portals and Business intelligence, Domain specific applications of IoT, Home automation, Industry applications, Surveillance applications, Other IoT applications Clustering, Synchronization, Software agents.

Unit-III

Cloud Computing : SaaS, PaaS, IaaS, Public and Private Cloud; Virtualization, Virtual Server, Cloud Storage, Database Storage, Resource Management, Service Level Agreement, Basics of IoT.

Unit-IV

Big Data Systems: Big Data Characteristics, Types of Big Data, Big Data Architecture, Introduction to Map- Reduce and Hadoop; Distributed File System, HDFS. NOSQL: NOSQL and Query Optimization; Different NOSQL Products, Querying and Managing NOSQL; Indexing and Ordering Data Sets; NOSQL in Cloud.

Reference Books:

1. Computer Today, A. Ravichandran, Khanna Publishing House
2. Internet of Things, Jeeva Jose, Khanna Publishing House
3. Big Data and Hadoop, V.K. Jain, Khanna Publishing House
4. Data Sciences and Analytics, V.K. Jain, Khanna Publishing House

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
INTRODUCTION TO PYTHON
Paper Code: PCC-WD-602

Semester:6th	Sessional: 25Marks
Stream: Web Development	Theory: 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0	Duration of Exam: 3Hours

Course Objectives:

1. To learn and understand Python programming basics and paradigm.
2. To learn and understand python looping, control statements and string manipulations.
3. Students should be made familiar with the concepts of GUI controls and designing GUI applications.
4. To learn and know the concepts of file handling, exception handling and database connectivity

Course Contents:

UNIT-I

Familiarization with the basics of Python programming: a simple "hello world"program, process of writing a program, running it, and print statements; simple datatypes: integer, float, string. Introduce the notion of a variable, and methods to manipulate it (concept of L-value and R-value even if not taught explicitly)

UNIT-II

Knowledge of data types and operators: accepting input from the console, assignment statement, expressions, operators and their precedence.

Conditional statements: if, if-else, if-elif-else; simple programs: e.g.: absolute value, sort numbers, and divisibility.

UNIT-III

Notion of iterative computation and control flow: for, while, flowcharts, decision trees and pseudo code; write a lot of programs: interest calculation, primarily testing, and factorials.

Idea of debugging: errors and exceptions; debugging: pdb, break points.

UNIT-IV

Lists, tuples and dictionary: finding the maximum, minimum, mean; linear search on• list/tuple of numbers, and counting the frequency of elements in a list using a dictionary. Introduce the notion of accessing elements in a collection using numbers and names.

Sorting algorithm: bubble and insertion sort; count the number of operations while sorting. Strings: compare, concat, substring; notion of states and transitions using state transition diagrams.

Reference Books:

1. Introduction to Computing and Problem Solving With Python, Jeeva Jose, Khanna Publishing House
2. Taming Python by Programming, Jeeva Jose, Khanna Publishing House

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
ENTREPRENEURSHIP
Paper Code: BSC-601

Semester:6th	Sessional: 25Marks
Stream: Web Development	Theory: 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

- Sketching an apt business plan
- Hiring and retaining a skilled workforce
- Financial stability
- Aligning marketing and sales

Course Contents

Unit-1:

Entrepreneurship and entrepreneur: Entrepreneurship concept and process, Entrepreneur, Essential Characteristics of a good Entrepreneur, Types of entrepreneur, Industrial Policy, Classification of industries- Micro, small scale , Medium scale, Large scale, Product identification/ selection, Site selection, Plant layout, Pre-market survey.

Unit-2:

Entrepreneurship Support System and Start-ups: Introduction to start-up's, Role of District Industries Centre in setting up industry, Function of NSIC, SISI, NISIET, NRDC, SSIC, SIDO, NMTC, KVIC, RSMML, Role of state finance corporation, state electricity corporations, pollution control board, BIS, I.S.O. etc.

Unit-3

Introduction to Tax System, and Acts: Idea of income tax, Goods and Services Tax and custom duty, Introduction to Industrial Acts, factory Act, Workmen's Compensation Act 1923, Apprentices Act 1961, Environmental Protection Act 1986

Unit-4:

Project Report Preparation: Procedure of preparing a project report, Format of project report, Preparation of project report, Introduction to ISO: 9000 Series of Quality System

Key Learning Outcomes

- Students will be aware about the concepts of entrepreneurship development and significance of entrepreneurship in economic development.
- It will help students to know about various acts related to an industry.
- Students will be able to prepare project report.
- They will be able to know the support available from Govt. to start a new venture.

Reference Books

- 1. Khanka S.S., "Entrepreneurship Development" S.Chand.
- 2. Desai, A N. "Entrepreneur & Environment" Ashish, New Delhi.
- 3. Drucker, Peter. "Innovation and Entrepreneurship" Heinemann, London.
- 4. Jain Rajiv. "Planning a Small Scale Industry: A Guide to Entrepreneurs" S.S. Books, Delhi.
- 5. Kumar, S A. "Entrepreneurship in Small Industry" Discovery, New Delhi

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
PYTHON LAB
Paper Code: PCC-WD-603

Semester:6th Internal: 60 Marks

Stream: Web Development External: 40 Marks

L T P Total Credits

0 0 9 9 Total: 100 Marks

Hours Duration of Exam: 3

Course Contents::

1. Python program to add two numbers
2. Maximum of two numbers in Python
3. Python Program for factorial of a number
4. Python Program for simple interest
5. Python Program for compound interest
6. Python Program to check Armstrong Number
7. Python Program for Program to find area of a circle
8. Python program to print all Prime numbers in an Interval
9. Python program to check whether a number is Prime or not
10. Python Program for n-th Fibonacci number
11. Python Program for How to check if a given number is Fibonacci number?
12. Python Program for n\'th multiple of a number in Fibonacci Series
13. Program to print ASCII Value of a character
14. Python Program for Sum of squares of first n natural numbers
15. Python Program for cube sum of first n natural numbers

Array Programs:

1. Python Program to find sum of array
2. Python Program to find largest element in an array
3. Python Program for array rotation
4. Python Program for Reversal algorithm for array rotation
5. Python Program to Split the array and add the first part to the end
6. Python Program for Find reminder of array multiplication divided by n
7. Python Program to check if given array is Monotonic

List Programs:

1. Python program to interchange first and last elements in a list
2. Python program to swap two elements in a list
3. Python | Ways to find length of list
4. Python | Ways to check if element exists in list
5. Different ways to clear a list in Python
6. Python | Reversing a List
7. Python program to find sum of elements in list
8. Python | Multiply all numbers in the list
9. Python program to find smallest number in a list
10. Python program to find largest number in a list

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
Computer Network Security
Paper Code: PCC-WD-605

Semester:6th	Sessional: 25Marks
Stream: Web Development	Theory: 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. To understand basics of Cryptography and Network Security
2. To be able to secure a message over insecure channel by various means.
3. To learn about how to maintain the Confidentiality, Integrity and Availability of a data
4. To understand various protocols for network security to protect against the threats in the networks.

Course Contents:

UNIT-I

Network Concept, Benefits of Network, Network classification (PAN, LAN, MAN, WAN), Peer to Peer, Client Server architecture, Transmission media: Guided & Unguided, Network Topologies. Networking terms: DNS, URL, client server architecture, TCP/IP, FTP, HTTP, HTTPS, SMTP, Telnet OSI and TCP/IP Models: Layers and their basic functions and Protocols, Comparison of OSI and TCP/IP. Networking Devices: Hubs, Switches, Routers, Bridges, Repeaters, Gateways and Modems, ADSL.

UNIT-II

Ethernet Networking: Half and Full-Duplex Ethernet, Ethernet at the Data Link Layer, Ethernet at the Physical Layer. Switching Technologies: layer-2 switching, address learning in layer-2 switches, network loop problems in layer-2 switched networks, Spanning-Tree Protocol, LAN switch types and working with layer-2 switches, Wireless LAN

UNIT- III

Internet layer Protocol: Internet Protocol, ICMP, ARP, RARP. IP Addressing: Different classes of IP addresses, Sub-netting for an internet work, Classless Addressing. Comparative study of IPv4 & IPv6. Introduction to Router Configuration. Introduction to Virtual LAN.

UNIT- IV

Transport Layer: Functions of transport layer, Difference between working of TCP and UDP. Application Layer: Domain Name System (DNS), Remote logging, Telnet, FTP, HTTP, HTTPS. Introduction to Network Security.

Key Learning Outcomes

After successful completion of the course, the learners would be able to

1. Provide security of the data over the network.
2. Do research in the emerging areas of cryptography and network security.
3. Implement various networking protocols.
4. Protect any network from the threats in the world.

Reference Books:

1. Information & Computer Security, Sarika Gupta, Khanna Publishing House
2. An Integrated Approach to Computer Networks, Bhavneet Sidhu, Khanna Publishing House

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
Introduction to AI
Paper Code: PCC-WD-604

Semester:6th	Sessional: 25Marks
Stream: Web Development	Theory: 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. Gain a historical perspective of AI and its foundations.
2. Become familiar with basic principles of AI toward problem solving, inference, perception, knowledge representation, and learning.
3. Investigate applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
4. Experience AI development tools such as an 'AI language', expert system shell, and/or data mining tool.

Course Content:

UNIT – I

Overview of A.I: Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success. Problems, problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem Heuristic search techniques : Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction

UNIT - II

Knowledge Representation: Definition and importance of knowledge, Knowledge representation, Various approaches used in knowledge representation, Issues in knowledge representation. Using Predicate Logic: Represent ting Simple Facts in logic, Representing instances and is-a relationship, Computable function and predicate.

UNIT - III

Natural language processing: Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing. Learning: Introduction learning, Rote learning, Learning by taking advice, Learning in problem solving, Learning from example-induction, Explanation based learning.

UNIT - IV

Expert System: Introduction, Representing using domain specific knowledge, Expert system shells. Knowledge acquisition: General concepts in knowledge acquisition, early work in Machine Learning, examples of Inductive Learners, computer vision, Robotics, overview of LISP- AI language.

Key Learning outcomes:

1) Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
2) Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
3) Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
4) Demonstrate profciency developing applications in an 'AI language', expert system shell, or data mining tool.

Reference Books:

1. Artificial Intelligence, Munish Chandra Trivedi, Khanna Publishing House

J.C. Bose University of Science & Technology, YMCA, Faridabad
(A Haryana State Government University)
(Established by Haryana State Legislative Act No. 21 of 2009 & Recognized by UGC Act 1956 u/s 22 to Confer Degrees)
Accredited 'A' Grade by NAAC

COMMUNITY COLLEGE OF SKILL DEVELOPMENT (CCSD)

Program B.Voc Web Development (program Code: 251)
Revised Scheme Course Index of the year 2020-2021(BOS Dated 18/05/2020)
Mapping of the course with the employability/Entrepreneurship/Skill Development

S.No	Course	Code	Skills Development	Entrepreneurship	Employability
1	BASICS OF OPERATING SYSTEM	PCC-WD-101	✓		✓
2	FUNDAMENTAL OF NETWORK AND SAFETY	PCC-WD-104	✓		✓
3	ENGINEERING CALCULATIONS	BSC-102	✓	✓	
4	COMMUNICATION SKILLS	BSC-101	✓	✓	
5	COMPUTER LAB	PCC-WD-106	✓	✓	✓
6	WEB DESIGNING	PCC-WD-203	✓	✓	✓
7	OBJECT ORIENTED PROGRAMMING	PCC-WD-205	✓	✓	✓
8	EMPLOYABILITY SKILLS	BSC-206	✓	✓	
9	ENGINEERING CALCULATIONS-II	BSC-202	✓	✓	
10	HTML LAB	PCC-WD-207	✓	✓	✓
11	COMPUTER LAB	PCC-WD-208	✓	✓	✓
12	SOFT SKILLS	BSC-301	✓	✓	
13	HTML AND CSS	PCC-WD-301	✓	✓	✓
14	COMPUTER GRAPHICS	PCC-WD-303	✓		✓
15	SOFTWARE ENGINEERING	PCC-WD-303	✓		✓
16	COMPUTER LAB	PCC-WD-304	✓	✓	✓
17	ON JOB TRANING	OJT-WD-402	✓	✓	✓
18	ON JOB TRANING	OJT-WD-501	✓	✓	✓
19	TECHNOLOGY TRENDS IN IT	PCC-WD-601	✓		✓
20	INTRODUCTION TO PYTHON	PCC-WD-602	✓		✓
21	ENTREPRENEURSHIP	BSC-601	✓	✓	
22	MINOR PROJECT	BSC-602	✓	✓	✓
23	PYTHON LAB	PCC-WD-603	✓	✓	✓

Principal, CCSD