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 6th Meeting of Board of Studies (BOS) Community College of Skill Development held on 24/10/2019 at 3.00 PM in the Conference Room of the Community College.**

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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. Mr. Sandeep Dutta
3. Dr. Sandhya Chintala
4. Mr. Anand Kumar Singh
5. Ms. Richie

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/06/01: **To consider and confirm the Minutes of its previous meeting held on 18/01/2019.**

The Board considered and confirmed the Minutes of its 5th meeting held on 18/01/2019.

Item No. BOS/06/02: **To note the Action Taken Report (ATR) on the Minutes of BOS meeting held on 18/01/2019.**

The Chairman informed the Board regarding the action taken on the minutes of BOS meeting held on 18/01/2019, where necessary. The Board noted the Action Taken Report, as placed before it.

Item No. BOS/06/03: **To consider and approve the Scheme & syllabi upto 2nd year B.Voc courses in Automobile, Electrical, Manufacturing and Web Development.** ***(Annexure – A)***

It was brought to the notice of the Board that earlier the first year scheme & syllabi of above courses were approved by the Board. However, the scheme & syllabi upto 2nd year of B.Voc courses in Automobile, Electrical, Manufacturing and Web Development is placed before the Board for consideration and approval.

The Board after detailed deliberations/discussions, approved the scheme & syllabi to be followed upto 2nd year B.Voc courses in Automobile, Electrical, Manufacturing and Web Development with some modifications.

Item No. BOS/06/04: **To consider and approve the modified syllabus & scheme of diploma courses.**

The Board considered and approved the modified scheme and syllabi of all Diploma courses being run under CCSD, as placed before it.

Item No. BOS/06/05: **To consider and approve Academic Calendar of CCSD courses for the semester July-Dec., 2019.**

The Board considered and approved the Academic Calendar of CCSD students for the semester July-Dec.,2019.

Item No. BOS/06/06: **To note the matter of starting of new course PG Diploma in Yoga Science & Naturopathy and also consider & approve the syllabi of PG Diploma in Yoga Science & Naturopathy.** ***(Annexure – B)***

The Board was informed and noted that from the session 2019-20, the CCSD has started one-year PG Diploma in Yoga Science & Naturopathy with the approval of competent authority. The Board after discussion on the subject matter approved the scheme & syllabi of PG Diploma in Yoga Science & Naturopathy. The syllabus of Diploma Yoga is also approved along with it.

Item No. BOS/06/07: **To note the matter of starting of new course PG Diploma in Data Science & Analytics and also consider & approve the syllabi of PG Diploma in Data Science & Analytics.** *(Annexure – C)*

The Board was informed and noted that from the session 2019-20, the CCSD has started one-year PG Diploma in Data Science & Analytics with the approval of competent authority. The Board considered and approved the scheme & syllabi of PG Diploma in Data Science & Analytics.

Item No. BOS/06/08: **To note the admission status in various courses of CCSD during the session 2019-20.**

The Chairman(BOS) presented the admission status (2019-20) of various courses being run under CCSD. After going through the same, the Board appreciated the admission status for the session 2019-20 and also extended congratulations to the entire team of CCSD for their best efforts in achieving the admission target.

Item No. BOS/06/09: **To consider and approve the proposal regarding following the University examination and question paper pattern.**

The Chairman(BOS) informed the members that the students of CCSD are registered on the portal as per pattern of the University. The conduct of examination in respect of CCSD students has been assigned to the Controller of Examination Office of the University. To have more transparency in the work, the CCSD intends to adopt the University examination and question paper setting pattern of the University.

The Board after discussion on the subject matter approved the proposal regarding following the University examination and question paper pattern, in respect of CCSD students.

Item No. BOS/06/10: **To consider and approve the proposal regarding issue of Degrees to the CCSD students by the COE office of the University.**

The Board considered and approved the proposal regarding issue of Degrees to the CCSD students by the COE office of the University.

Item No. BOS/06/11: **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/06/12: **To consider and approve the list of external examiners for CCSD students.**

The Board considered and approved the list of external examiners for CCSD students with the following suggestions: -

(i) The teachers of JCBUST, YMCA Faridabad can also be invited as external examiners.
(ii) The teachers from other Institutions running B.Voc courses should be invited.
(iii) Preference should be given to the teachers working in Govt/Govt. aided institutions.

Meeting ended with a vote of thanks to the Chair.

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

Annexure – 1 of BOS dated 24.10.2019

1. The list of new courses introduced in the approved syllabus of B.Voc (Automobile, Electrical, Manufacturing and Web Development) 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 Electrical	60%	List of revised/new courses is attached. Revisions are also highlighted in the course syllabus.
2	B.Voc Manufacturing	60%	List of revised/new courses is attached. Revisions are also highlighted in the course syllabus.
3	B.Voc Web Development	60%	List of revised/new courses is attached. Revisions are also highlighted in the course syllabus.
4	B.Voc Automobile	60%	List of revised/new courses is attached. Revisions are also highlighted in the course syllabus.
5	PG Diploma Data Science and Analytics	100%	List of revised/new courses is attached. Revisions are also highlighted in the course syllabus.
6	PG Diploma Yoga Science & Naturopathy	100%	List of revised/new courses is attached. Revisions are also highlighted in the course syllabus.

Principal, CCSD

New Courses Introduced 2019-2020

Program Name	Name of the Course	Course Code
B.VOC WEB DEVELOPMENT	ENGINEERING CALCULATION	BSC-102
B.VOC WEB DEVELOPMENT	PC ASSEMBLY LAB	PCC-WD-107
B.VOC WEB DEVELOPMENT	EMPLOYBILITY SKILLS	BSC-206
B.VOC WEB DEVELOPMENT	OBJECT ORIENTED PROGRAMMING	PCC-WD-205
B.VOC WEB DEVELOPMENT	HTML LAB	PCC-WD-207
B.VOC WEB DEVELOPMENT	SOFT SKILLS	BSC-301
B.VOC WEB DEVELOPMENT	HTML AND CSS	PCC-WD-301
B.VOC WEB DEVELOPMENT	COMPUTER GRAPHICS	PCC-WD-302
B.VOC WEB DEVELOPMENT	SOFTWARE ENGINEERING	PCC-WD-303
B.VOC WEB DEVELOPMENT	COMPUTER WORKSHOP	PCC-WD-304
B.VOC WEB DEVELOPMENT	COMPUTER GRAPHICS LAB	PCC-WD-305
B.VOC WEB DEVELOPMENT	SOFT SKILLS	BSC-401
B.VOC WEB DEVELOPMENT	OPERATING SYSTEM-II	PCC-WD-401
B.VOC WEB DEVELOPMENT	CORE JAVA	PCC-WD-402
B.VOC WEB DEVELOPMENT	MULTIMEDIA TECHNOLOGY	PCC-WD-403
B.VOC WEB DEVELOPMENT	COMPUTER LAB	PCC-WD-404
B.VOC ELECTRICAL	ELECTRICAL TECHNOLOGY	PCC-EL-105
B.VOC ELECTRICAL	WORKSHOP	PCC-EL-106

B.VOC ELECTRICAL	ELECTRICAL MACHINE - II	PCC-EL-201
B.VOC ELECTRICAL	ELECTRICAL VEHICLE-I	PCC-EL-205
B.VOC ELECTRICAL	ELECTRICAL WORKSHOP	PCC-EL-206
B.VOC ELECTRICAL	SOFT SKILLS	BSC-301
B.VOC ELECTRICAL	NETWORK ANALYSIS AND SYNTHESIS	PCC-EL-301
B.VOC ELECTRICAL	INSTALLATION AND MAINTENANCE OF ELECTRICAL EQUIPMENTS	PCC-EL-302
B.VOC ELECTRICAL	BASICS OF ELECTRONICS	PCC-EL-303
B.VOC ELECTRICAL	PLC WORKSHOP	PCC-EL-304
B.VOC ELECTRICAL	ON JOB TRAINING	OJT-EL-401
B.VOC AUTOMOBILE	ENGINEERING SCIENCE	PCC-AM-106
B.VOC AUTOMOBILE	MOTOR VEHICLE AND TECHNOLOGY-I	PCC-A-101
B.VOC AUTOMOBILE	EMPLOYBILITY SKILLS	BSC-206
B.VOC AUTOMOBILE	APPLIED SCIENCE	PCC-AM-205
B.VOC AUTOMOBILE	AUTOMOBILE WORKSHOP-2	PCC-A-206
B.VOC AUTOMOBILE	SOFT SKILLS	BSC-301
B.VOC AUTOMOBILE	MANUFACTURING TECHNOLOGY-III	PCC-AM-301
B.VOC AUTOMOBILE	MATERIAL SCIENCE	PCC-AM-302
B.VOC AUTOMOBILE	MOTOR VEHICLE TECHNOLOGY-II	PCC-AM-303
B.VOC AUTOMOBILE	AUTOMOBILE ELECTRICAL AND ELECTRONICS	PCC-AM-304
B.VOC AUTOMOBILE	WORKSHOP	PCC-AM-305
B.VOC AUTOMOBILE	MOTOR VEHICLE TECHNOLOGY-I	PCC-A-101

B.VOC AUTOMOBILE	ON JOB TRAINING	OJT-AM-401
B.VOC MANUFACTURING	ENGINEERIGN SCIENCE	PCC-AM-106
B.VOC MANUFACTURING	EMPLOYBILITY SKILLS	BSC-206
B.VOC MANUFACTURING	APPLIED SCIENCE	PCC-AM-205
B.VOC MANUFACTURING	SOFT SKILLS	BSC-301
B.VOC MANUFACTURING	MANUFACTURING TECHNOILOGY-III	PCC-AM-301
B.VOC MANUFACTURING	MATERIAL SCIENCE	PCC-AM-302
B.VOC MANUFACTURING	MOTOR VEHICLE TECHNOLOGY-II	PCC-AM-303
B.VOC MANUFACTURING	AUTOMOBILE ELECTRICAL AND ELECTRONICS	PCC-AM-304
B.VOC MANUFACTURING	WORKSHOP	PCC-AM-305
B.VOC MANUFACTURING	ON JOB TRAINING	OJT-AM-401

Annexure – “A”

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

2019-20

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
	Motor Vehicle technology -1	PCC-A-101	3	Elements of Automobile Engg.	PCC-AM-203	3
	Automobile Workshop-1	PCC-A-105	18	Automobile Workshop-2	PCC-A-206	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-301	3	On Job Training (OJT)/ Internship	OJT-AM-401	30
	Automobile Electrical Equipment	PCC-AM-304	3			
	Manufacturing Technology-3	PCC-AM-301	3			
	Soft Skills	BSC-301	3			
	Material Science	PCC-AM-302	3			
	Automobile Workshop-3	PCC-AM-305	15			
	Total		30	Total		30
	Cumulative Credits = 120 ADVANCED DIPLOMA					
	NSQF LEVEL- 6 JOB ROLE - AUTOMOTIVE SERVICE TECHNICIAN (ASC/Q1404)					

FIRST SEMESTER

MOTOR VEHICLE TECHNOLOGY – I

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 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	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 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
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 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 understand the tools used to assess and confirm technical faults that cannot be determined through a visual inspection.
4. To ensure any malfunctions observed in tools and equipment are reported to the concerned persons.
5. 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 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.

Unit – V Advance Communication Systems: Basic elements of communication systems with block diagram, List commonly used terms in electronic communication systems. Satellite communication: Introduction, advantages and disadvantages, Optical fiber: principle and applications.

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, 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.

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	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 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

SOFT SKILLS

Semester -3rd	Sessional – 25 Marks
Stream– B.Voc (AM)	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
4 0 0 4	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

MANUFACTURING TECHNOLOGY-3

Semester -3rd	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

UNIT-1

GENERAL PROCESS: Classification and elementary idea of metal forming processes on the basis of the properties of deformability (Plasticity), fusibility and divisibility viz., Rolling, Forging, Drawing, Extruding, Spinning, Pressing, Punching, Blanking, Welding, Soldering, Brazing, Metal cutting processes-turning, Drilling, Boring, Shaping, Grinding, Elementary idea of machines used for the above processes.

UNIT-2

WELDING: (a) Weld edge preparation, Introduction to various welding processes with procedure equipment and applications such as (i) Electric arc welding. (ii) Resistance welding. (iii) Thermit welding (iv) Carbon arc gauging. (v) Metal-Inert-Gas welding (MIG) (vi) Tungsten Inert Gas welding (TIG) (vii) Atomic Hydrogen arc welding. (viii) Stud welding. (ix) Laser Beam, Electron Beam welding, Explosion welding (b) Welding Arcs: Definition, arc initiation, arc structures, types of arc, metal transfer characteristics and influencing parameters, weld bead geometry, various types of electrodes used in various processes.

UNIT -3

PATTERN & MOULDING: The pattern materials used, Types of pattern allowances and pattern layout, Colour scheme patterns defects, Types of cores and their utility.

Moulding and Pouring: Classification of mould materials according to characteristics, Types of sands and their importance test, parting powders and liquids, Sand mixing preparation, Moulding defects MELTING AND POURING: Brief idea of refractory material and fluxes, Fuels and metallic materials used in foundry. Melting furnaces used in foundry such as pit furnace, Tilting and cupola furnaces, their construction and operation, metals and alloys. Additions to molten metal, Closing and pouring of the moulds, Coring-up, venting and closing, use of ladles, spur and risers, Defects due to closing and spurring, Basic idea of fettling operations. Surface treatment, Salvaging of castings, Factors determining soundness of casting.

UNIT-4

FOUNDRY PRACTICE: Elementary idea of special casting processes-Shell mould casting, die casing, investment mould casting, centrifugal and continuous casting full mould casting. Elementary idea of mechanisation of foundries

POWDER METALLURGY: Introduction, principle, scope and names of processes. Production of metal powders, compaction, sintering and sizing, Self-lubricated bearings. Advantages of the process and its limitations (Elementary concept only)

MATERIAL SCIENCE

Semester -3rd	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

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

WORKSHOP-3

Semester -3rd	Internal – 50 Marks
Stream– B.Voc (A/M)	External – 50 Marks
L T P Total Credits	Total: 100 Marks
0 0 8 10	Duration of Exam: 3 Hours

1: INTRODUCTION TO AUTOCAD

Starting AutoCAD, AutoCAD Screen Components (Drawing Area Command Window Navigation bar Status bar), Invoking Commands in AutoCAD 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 Undo Option, 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 DDEDIT Command 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.

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 Bachelor of vocation Automobile (program Code: 253)
Revised Scheme Course Index of the year 2019-2020 (BOS Dated 18/10/2019)

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

S. N.	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 Technology-1	PCC-A-101	√		
5	Workshop	PCC-A-105	√		√
6	Employability Skills - 1	BSC-206	√	√	√
7	Applied Science	PCC-AM-205	√		
8	Quality, inspection and Safety	PCC-AM-202	√		
9	Element of Automobile Engineering	PCC-AM-203	√		
10	Automobile Workshop-2	PCC-A-206	√	√	√
11	Manufacturing Technology-3	PCC-AM-301	√		
12	Material Science	PCC-AM-302	√		
13	Motor Vehicle Technology-2	PCC-AM-303	√		√
14	Automobile Electrical & Electronics	PCC-AM-304	√		
15	Soft Skills	BSC-301	√	√	√
16	On Job Training (OJT)/ Internship	OJT-AM-401	√	√	√

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**	**Credits**	**Course**	**Credits**
	Electrical Technology	3	Electrical Wiring	3
	Electrical Machine - I	3	Electrical Machine - II	3
	Communication skills	3	Electrical Vehicle -I	3
	Engineering calculations	3	Engineering calculations	3
	Workshop	18	Electrical workshop	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**	**Credits**	**Course**	**Credits**
	Network analysis and synthesis	3	On Job Training (OJT)/ Internship evaluation including report and presentation	30
	Installation and maintenance of electrical equipment's	3		
	Basics of Electronics	3		
	Soft Skills	3		
	PLC Workshop	18		
	Total	30	Total	30
Cumulative credits = 120 (Advance Diploma)				
Qualification Pack Code: CON/Q0604 NSQF LEVEL-5 JOB ROLE – FOREMAN				

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	Workshop	0	18	18

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA (FARIDABAD)

COMMUNITY COLLEGE OF SKILL DEVELOPMENT

ELECTRICAL TECHNOLOGY

Paper Code- PCC-EL-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 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.

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

Electrical Machines

Paper Code- PCC-EL-101

Semester: 1st
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 basics of Machines.
2. To learn about different types of machine.
3. To understand working mechanism of machines.

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: Construction: 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 Transformer

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. Understands the concept of operation of machines
2. Learns basics of electrical circuits
3. Have knowledge of basic electrical Machines

Text/Reference books:

1. Basics of Electrical Engineering By K.UMA RAO.
2. Electric Machines by Ashfaq Husain.
3. Electrical Machines by Mandhir Verma.
4. Engineering Thermodynamics by PK Nag; Tata McGraw Hill, Delhi.
5. Basic Engineering Thermodynamics by Roy Chaudhary; Tata McGraw Hill, Delhi.
6. Fundamentals of Electrical Engineering by Sahdev, Uneek Publication, Jalandhar.

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

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COMMUNITY COLLEGE OF SKILL DEVELOPMENT

ENGINEERING CALCULATIONS

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: 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.
5. Applied Mathematics For Polytechnics By H.K. Dass.

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA(FARIDABAD)

COMMUNITY COLLEGE OF SKILL DEVELOPMENT

Electrical Workshop

Paper Code- PCC-EL-104

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.

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-I	3	0	3
BSC-202	Engineering Calculations	3	0	3
PCC-EL-206	Electrical workshop	0	18	18

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA (FARIDABAD)

COMMUNITY COLLEGE OF SKILL DEVELOPMENT

Electrical Machines –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 learn safety measures from Electrical hazards.
2. To have Basic knowledge of Electrical Instruments.
3. To familiarize with the Electrical Machines.
4. To study Electrical Accessories and wiring techniques.

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 electric motor and transformer.
2. Have knowledge of basic electrical machines
3. Learns circuit series in electric home appliances.
4. Have knowledge of various wiring techniques used.

Text/Reference books:

1. Basic Engineering Thermodynamics by Roy Chaudhary; Tata McGraw Hill, Delhi.
2. Fundamentals of Electrical Engineering by Sahdev, Uneek Publication, Jalandhar.
3. Basic Electrical Engineering by PS Dhogal, Tata McGraw Hill Education Pvt. Ltd., New Delhi.

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 learn about basic engineering instruments.
2. To have knowledge of sheet layout.
3. To learn dimensioning and reading of sketches.

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 befoe supplying mains, General faults of Elctrical 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 ,Typs of Cables, Fire Alrm.

Course Outcomes:

1. Have knowledge of engineering instruments.
2. Learns lines and symbols of drawing.
3. Learns freehand sketching.
4. Understands projections of drawing.

Text/Reference books:

1. Engineering Drawing by KK Dhiman, Ishan Publications, Ambala, Haryana.
2. Elementary Engineering Drawing (in first angle projection) by ND Bhatt, Charotar Publishing House, Anand, Gujrat.
3. A Text Book of Engineering Drawing by Surjit Singh published by Dhanpat Rai and Co., Delhi.
4. Engineering Drawing by PS Gill published by SK Kataria and sons, Delhi.

Course Objectives:

1. To learn about basic engineering instruments.
2. To have knowledge of sheet layout.
3. To learn dimensioning and reading of sketches.

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA (FARIDABAD)

COMMUNITY COLLEGE OF SKILL DEVELOPMENT

Electrical Vehicle-I

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

Unit I: Introduction of Electric Vehicles: Electric vehicle Architecture: Major components of electric vehicle 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: Single Phase, three Phase AC Induction Motors, Traction controller, Traction batteries, Traction cooling system, EV charging, precautions while working on High voltage.

Unit IV: VMU: Electric Vehicle Management unit: VMU Functionalities, VMU input/output overview safety precautions while R&R VMU,

EV Charging System: Electric Vehicle Charger: Main components of EV Charger, EV Charging Sockets, Charging of Electric Vehicle, Basic Charging system faults and rectification, safety precautions for EV charging.

Course Outcomes:

1. Students will learn about Electrical Vehicles.
2. Students will be updated about latest technology.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
Engineering Calculations
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 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 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 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 Integration: Concepts of integration, integration of trigonometric, exponential and logarithmic functions, integration by parts.

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:

6. Mathematics Book by R.D Sharma
7. Advanced Engineering Mathematics By Jain Rk.
8. A Basic Course in Mathematics By Nabjyoti Dutta.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
Electrical Workshop II
Paper Code- PCC-EL- 205

Semester 2nd
Stream–Electrical
L T P Total Credits
3 0 0 3 Duration of Exam: 3 Hours

Course Objectives:

1. To verify basic electrical laws.
2. To have knowledge of Wiring Circuit.
3. Grasp the concept of transformer in detail.
4. Understands the concept of safety.
5. To know Symbols and electrical machines.
6. 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 three phase induction motor.

8. No load and Blocked rotor test on three phase induction motor to draw (i) equivalent circuit and (ii) circle diagram. Determination of performance parameters at different load conditions from (i) and (ii).

9. Load test on induction generator.

10. Load test on single phase induction motor to draw output versus torque, current, power and efficiency characteristics.

11. Conduct suitable tests to draw the equivalent circuit of single phase induction motor and determine performance parameters.

12. Conduct an experiment to draw V and Λ curves of synchronous motor at no load and load conditions.

13. To obtain magnetization characteristics of a D.C. Shunt generator. Determine critical field resistance of D.C. Shunt generator using O.C.C.

14. To Join electrical cables using standard cable joining methods.
15. Demonstrate nature of common faults in electrical installations of equipments and possible electrical tests/ inspections.
16. Practice installation of conduits, race ways, switch boards, distribution boards, lights, fans and lighting fixtures

17. Practice cable laying through conduits.

Course Outcomes:

1. Learns to Verify electrical laws.
2. Have working knowledge of Wiring and installations.
3. Have hands on experience about various machines and electrical Connection.
4. Obtain practical skills of basic instruments and working of circuits used in the workshop

SEMESTER – 3rd SCHEME

Paper Code	Course	L	T/P	Credits
PCC-EL-301	Network analysis and Synthesis	3	0	3
PCC-EL-302	Installation and maintenance of Electrical Equipment's	3	0	3
PCC-EL-303	Basics of Electronics	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

Soft Skills

Paper Code: BSC-302

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 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.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT

INSTALLATION AND MAINTENANCE OF ELECTRICAL EQUIPMENT
PCC-EL-302

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 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-1: Introduction to Electrical Measuring Instruments: Concept of measurement and instruments, 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 principlesof 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)

Course Outcomes:

1. Illustrate and familiarize the basic concepts and scope of industrial safety.
2. Understand the standards of professional conduct that are published by professional safety organizations and certification bodies
3. Illustrate the importance of safety of employees while working with machineries.
4. Learns safety in various industrial hazard zones.

Text/Reference books:

1. Industrial safety management by L.M. Deshmukh, Tata Megraw Hill publication ,New Delhi, 2006.
2. Industrial safety health and environment Management system by R.K. Jain & Sunil S. Rao, Khanna Publications , 2008 .

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT

NETWORK ANALYSIS AND SYNTHESIS

Paper Code-PCC-EL-301

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 get basic idea about types specification in common values of passive components.
2. To get a basic idea about various parameter and network.

Unit I: Basics of Network Parameter: DC and AC circuits, difference between DC and AC analysis, two port network. Z Parameter, Y-Parameter, Hybrid Parameter, ABCD Parameter, T network, H network, Conversion of simple circuit into a two-port network, series and parallel connection of two port network.

Unit II: Steady state analysis: Introduction, Steady state analysis of a two-port network.

Transient state analysis: Introduction, Transient state analysis of a two-port network, concept of delay time, rime time and peek time, difference between Steady state and transient state.

Unit III: Laplace Transform: Introduction, conditions for Laplace transform, properties of Laplace transform, Laplace transform of unit step, unit ramp, parabolic, rectangular, triangular, linear and exponential function, application of Laplace transform in network analysis, superposition theorem, mesh and nodal analysis.

Unit IV: Fourier Transform: Introduction, conditions for Fourier transform, properties of Fourier transform, Fourier transform of unit step, unit ramp, parabolic, rectangular, triangular, linear and exponential function, application of Fourier transform in network analysis, superposition theorem, mesh and nodal analysis.

Course Outcomes:

1. Students will learn about network synthesis method.
2. Students will be updated about latest technology.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT

BASICS OF ELECTRONICS
PCC- EL-303

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 working in characteristics of diodes, transistors, MOSFETS and some measuring instruments.
2. To understand working of diodes in circuits, rectifiers and OP-Amp.

Course Contents

Unit I: Introduction: Basics of electronics, semiconductor, P-type semiconductor, N-type semiconductors, defects in semiconductors

Unit II: Diodes: Introduction, Structure and working of diodes, diode junction, diode equation, analysis of circuit consisting of diode, application of diode.

Unit III: Transistors: Introduction, difference between a diode and a transistor, Emitter, Base, collector, transistor configuration: common Base (CB), common emitter (CE), common collector (CC), transistor equation, transistor gain, analysis of circuit consisting of transistor, application of transistor, structure and working of a rectifier, structure and working of an amplifier, structure and working of a rectifier, structure and working of a FET, MOSFET and JFET.

Unit IV: Operational amplifier: Introduction, Structure and working of an operational amplifier (OP-AMP), amplifier equation, virtual ground concept, inverting and non-inverting amplifier, adder, subtracter, integrator and differentiator, Feedback amplifier, analysis of circuit consisting of amplifier, application of operational amplifier.

Course Outcomes:

1. Student can set up simple circuits using diodes and transistors.
2. Students can identify the active and passive electronic components and have knowledge of various amplifying techniques used.

Text/Reference books:

1. Basic Engineering Thermodynamics by Roy Chaudhary; Tata McGraw Hill, Delhi.
2. Fundamentals of Electrical Engineering by Sahdev, Uneek Publication, Jalandhar.
3. Basic Electrical Engineering by PS Dhogal, Tata McGraw Hill Education Pvt. Ltd., New Delhi.

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

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

Program B.Voc Electrical (Program Code: 252)
Revised Scheme Course Index of the Year 2019-20 (BOS Dated 24/10/2019)
Mapping of the Courses with the Employability/Entrepreneurship/Skill Development

S.NO	Course Name	Course Code	Skill Development	Entrepreneurship	Employability
1	COMMUNICATION SKILLS	BSC-101	√	√	
2	ENGINEERING CALCULATIONS	BSC-102	√	√	
3	ELECTRICAL TECHNOLOGY	PCC-EL-105	√		√
4	ELECTRICAL MACHINE - I	PCC-EL-101	√		√
5	WORKSHOP	PCC-EL-106	√	√	√
6	ENGINEERING CALCULATIONS	BSC-202	√		√
7	ELECTRICAL MACHINE - II	PCC-EL-201	√		√
8	ELECTRICAL WIRING	PCC-EL-202	√		√
9	ELECTRICAL VEHICLE-I	PCC-EL-205	√		√
10	ELECTRICAL WORKSHOP	PCC-EL-206	√	√	√
11	SOFT SKILLS	BSC-301	√	√	
12	NETWORK ANALYSIS AND SYNTHESIS	PCC-EL-301	√		√
13	INSTALLATION AND MAINTENANCE OF ELECTRICAL EQUIPMENTS	PCC-EL-302	√		√
14	BASICS OF ELECTRONICS	PCC-EL-303	√		√
15	PLC WORKSHOP	PCC-EL-304	√	√	√
16	ON JOB TRAINING	OJT-EL-401	√	√	√

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

2019-20

SYLLABUS & SCHEME OF EXAMINATION

Year	FIRST SEMESTER			SECOND SEMESTER		
	Course	**Code**	**Credit**	**Course**	**Code**	**Credit**
	Communication Skills	BSC-101	3	Employability Skills - 1	BSC-206	3
	Engineering Calculations	BSC-102	3	Applied Science	PCC-AM-205	3
I	Engineering Science	PCC-AM-106	3	Quality, inspection and Safety	PCC-AM-202	3
	Manufacturing process-1	PCC-M-101	3	Manufacturing process-2	PCC-AM-201	3
	Manufacturing Workshop-1	PCC-M-105	18	Manufacturing Workshop-2	PCC-M-206	18
	Cumulative Credits = 30 Certificate			**Cumulative Credits = 60 Diploma**		
	NSQF LEVEL - 5 JOB ROLE – MACHINE SHOP SUPERVISOR (ASC/Q3505)					
Year	**THIRD SEMESTER**			**FOURTH SEMESTER**		
	Manufacturing Technology-3	PCC-AM-301	3	On Job Training (OJT)/ Internship	OJT-AM-401	30
	Material Science	PCC-AM-302	3			
	Motor Vehicle Technology-2	PCC-AM-303	3			
II	Automobile Electrical & Electronics	PCC-AM-304	3			
	Soft Skills	BSC-301	3			
	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)					

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
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 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
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 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	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 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 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.

Unit – V Advance Communication Systems: Basic elements of communication systems with block diagram, List commonly used terms in electronic communication systems. Satellite communication: Introduction, advantages and disadvantages, Optical fiber: principle and applications.

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– 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 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). To maintain 5S at the work premises:

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

MANUFACTURING TECHNOLOGY-3

Semester -3rd	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

UNIT-1

GENERAL PROCESS: Classification and elementary idea of metal forming processes on the basis of the properties of deformability (Plasticity), fusibility and divisibility viz., Rolling, Forging, Drawing, Extruding, Spinning, Pressing, Punching, Blanking, Welding, Soldering, Brazing, Metal cutting processes-turning, Drilling, Boring, Shaping, Grinding, Elementary idea of machines used for the above processes.

UNIT-2

WELDING: (a) Weld edge preparation, Introduction to various welding processes with procedure equipment and applications such as (i) Electric arc welding. (ii) Resistance welding. (iii) Thermit welding (iv) Carbon arc gauging. (v) Metal-Inert-Gas welding (MIG) (vi) Tungsten Inert Gas welding (TIG) (vii) Atomic Hydrogen arc welding. (viii) Stud welding. (ix) Laser Beam, Electron Beam welding, Explosion welding (b) Welding Arcs: Definition, arc initiation, arc structures, types of arc, metal transfer characteristics and influencing parameters, weld bead geometry, various types of electrodes used in various processes.

UNIT -3

PATTERN & MOULDING: The pattern materials used, Types of pattern allowances and pattern layout, Colour scheme patterns defects, Types of cores and their utility.

Moulding and Pouring: Classification of mould materials according to characteristics, Types of sands and their importance test, parting powders and liquids, Sand mixing preparation, Moulding defects MELTING AND POURING: Brief idea of refractory material and fluxes, Fuels and metallic materials used in foundry. Melting furnaces used in foundry such as pit furnace, Tilting and cupola furnaces, their construction and operation, metals and alloys. Additions to molten metal, Closing and pouring of the moulds, Coring-up, venting and closing, use of ladles, spur and

risers, Defects due to closing and spurring, Basic idea of fettling operations. Surface treatment, Salvaging of castings, Factors determining soundness of casting.

UNIT-4

FOUNDRY PRACTICE: Elementary idea of special casting processes-Shell mould casting, die casing, investment mould casting, centrifugal and continuous casting full mould casting. Elementary idea of mechanisation of foundries

POWDER METALLURGY: Introduction, principle, scope and names of processes. Production of metal powders, compaction, sintering and sizing, Self-lubricated bearings. Advantages of the process and its limitations (Elementary concept only)

MATERIAL SCIENCE

Semester -3rd	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 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.

MOTOR VEHICLE TECHNOLOGY-2

Semester -3rd	Sessional – 25 Marks
Stream– B.Voc (A)	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
4 0 0 4	Duration of Exam: 3 Hours

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.

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

AUTOMOBILE ELECTRICAL & ELECTRONICS

Semester -3rd	Sessional – 25 Marks
Stream– B.Voc (A)	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
4 0 0 4	Duration of Exam: 3 Hours

OBJECTIVE

 To impart knowledge to the students in the principles of operation and constructional details of various Automotive Electrical and Electronic Systems like Batteries, Starting System, Charging System, Ignition System, Lighting System and 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.

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

SOFT SKILLS

Semester -3rd	Sessional – 25 Marks
Stream– B.Voc (AM)	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
4 0 0 4	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	Internal – 25 Marks
Stream– B.Voc (A/M)	External – 25 Marks
L T P Total Credits	Total: 50 Marks
0 0 8 10	Duration of Exam: 3 Hours

1: INTRODUCTION TO AUTOCAD

Starting AutoCAD, AutoCAD Screen Components (Drawing Area Command Window Navigation bar Status bar), Invoking Commands in AutoCAD 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 Undo Option, 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 DDEDIT Command 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.

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 Bachelor of vocation Manufacturing (program Code: 254)

Revised Scheme Course Index of the year 2019-2020(BOS Dated 24.10.2019)

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-M-101	√		
5	Manufacturing Workshop-1	PCC-M-105	√	√	√
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-M-206	√	√	√
11	Manufacturing Technology-3	PCC-AM-301	√		
12	Material Science	PCC-AM-302	√		
13	Motor Vehicle Technology-2	PCC-AM-303	√		
14	Automobile Electrical & Electronics	PCC-AM-304	√		
15	Soft Skills	BSC-301	√	√	√
16	On Job Training (OJT)/ Internship	OJT-AM-401	√	√	√

Principal CCSD

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD

COMMUNITY COLLEGE OF SKILL DEVELOPMENT

CURRICULAM FOR

B.VOC

WEB DEVELOPMENT
(2019-20)

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 SCtfEME

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- 107	PC ASSEMBLY LAB	0	6	6
PCC-WD-106	COMPUTER WORKSHOP	0	12	12

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 12 12

Internal: 30 Marks
External: 20 Marks
Total: 50 Marks
Duration of Exam: 3 Hours

Course Objectives**:**

1. To have a basic knowledge of MS- Office.
2. To learn about the basic components of a computer and their working.
3. To learn about the internal components of CPU.
4. To have a deep insight of various peripheral devices along with their sub-components and features.
5. To learn how these units are assembled.
6. To be familiar with syntax and structure of C-Programming
7. To learn problem solving techniques using C.
8. To be familiar with different data types, Operators and Expressions in C.
9. To be familiar with formatted and unformatted I/O in C with preprocessor directives.
10. To understand the programming using Loop & nested loop Statements (for, while, do-while).
11. To understand programming using different dimensions of Array.
12. To understand programming with Pointer, String and Function call by reference.

Course Contents:

Computer Hardware and Software

1. To study the basic concepts of MS-Word and its features, creating a word document.
2. To study the basic concepts of MS-Powerpoint and its features, creating presentations in powerpoint.
3. To study the basic concepts of MS-Excel and its features, creating sheets in MS-Excel.
4. To demonstrate History, Generation, classifications and types of Computer.
5. To study and demonstrate Block diagram of Digital Computer System and brief explanation of each unit.
6. Identification of various parts of the computer, Connection of various devices like CPU, Monitor, Keyboard, Mouse etc.
7. To study the shut down procedure, working in Windows, Opening of CPU, Identify the Clock-Section within the CPU.
8. To study Soldering and De-Soldering skills.
9. To study and demonstrate primary memory and secondary memory.
10. Tracing of various primary and secondary memories i.e. RAM and ROM on board and their capacity/size, Connectionof Hard-Disk in the CPU.
11. To Study formatting of Hard-Disk, partitioning of Hard-Disk, disk-defragmentation, disk-cleanup, scan-disk etc.
12. To demonstrate CPU Block diagram and Identification of different I/O port in the CPU and their purpose. Identifygraphic and other cards and their function.
13. To study working of various types of Monitors: CRT, LCD and LED.
14. To study Keyboard and Mouse: Wired, Wireless, Scroll & Optical.
15. To study Printers: Dot Matrix Printers, Daisy wheel Printers, Ink-Jet Printers and Laser Jet Printers.
16. To study the various types of Projectors: CRT, DLP and LED.
17. To study the interface of Printers, Scanner, Modem etc., Installation of Printer, Driver, Modem etc.
18. To learn how to set up BIOS, Boot configuration and Boot menu etc.
19. To Study the identification and connection of motherboard, types of motherboard.
20. To study the configuration of motherboard, identifying the internal and external connectors and data cables.
21. To study the system bus and its types, functions and features.
22. Assembly/ Installation Personnel Computer Systems: Practical exercise on assembly of Personnel Computer System, Installation of Windows Operating System, Installation of other Application Softwares and Utility Softwares.
23. To study the installation of Windows and Linux operating system.
24. To study the basic concepts of DBMS, creating tables and querying the tables.
25. To study computer maintenance and security, running of virus protection programme.

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 printthe 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 isdivisible 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.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
Community college of skill development
PC Assembly Lab
Paper Code: PCC-WD-107

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 have a basic knowledge of MS- Office.
2. To learn about the basic components of a computer and their working.
3. To learn about the internal components of CPU.
4. To have a deep insight of various peripheral devices along with their sub-components and features.
5. To learn how these units are assembled.

Course Contents:

Computer Hardware and Software

1. To study the basic concepts of MS-Word and its features, creating a word document.
2. To study the basic concepts of MS-Powerpoint and its features, creating presentations in powerpoint.
3. To study the basic concepts of MS-Excel and its features, creating sheets in MS-Excel.
4. To demonstrate History, Generation, classifications and types of Computer.
5. To study and demonstrate Block diagram of Digital Computer System and brief explanation of each unit.
6. Identification of various parts of the computer, Connection of various devices like CPU, Monitor, Keyboard, Mouseetc.
7. To study the shut down procedure, working in Windows, Opening of CPU, Identify the Clock-Section within the CPU.
8. To study Soldering and De-Soldering skills.
9. To study and demonstrate primary memory and secondary memory.
10. Tracing of various primary and secondary memories i.e. RAM and ROM on board and their capacity/size, Connectionof Hard-Disk in the CPU.
11. To Study formatting of Hard-Disk, partitioning of Hard-Disk, disk-defragmentation, disk-cleanup, scan-disk etc.
12. To demonstrate CPU Block diagram and Identification of different I/O port in the CPU and their purpose. Identifygraphic and other cards and their function.
13. To study working of various types of Monitors: CRT, LCD and LED.
14. To study Keyboard and Mouse: Wired, Wireless, Scroll & Optical.
15. To study Printers: Dot Matrix Printers, Daisy wheel Printers, Ink-Jet Printers and Laser Jet Printers.
16. To study the various types of Projectors: CRT, DLP and LED.
17. To study the interface of Printers, Scanner, Modem etc., Installation of Printer, Driver, Modem etc.
18. To learn how to set up BIOS, Boot configuration and Boot menu etc.
19. To Study the identification and connection of motherboard, types of motherboard.
20. To study the configuration of motherboard, identifying the internal and external connectors and data cables.
21. To study the system bus and its types, functions and features.
22. Assembly/ Installation Personnel Computer Systems: Practical exercise on assembly of Personnel Computer System, Installation of Windows Operating System, Installation of other Application Softwares and Utility Softwares.
23. To study the installation of Windows and Linux operating system.
24. To study the basic concepts of DBMS, creating tables and querying the tables.
25. To study computer maintenance and security, running of virus protection programme.

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
Stream: Web Development
L T P Total Credits
3 0 0 3
Hours

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

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-IComplex 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 -IIMatrices 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 - IIIDifferentiation: Introduction to Derivatives, Product Rule, Quotient Rule, Chain Rule, Derivatives of Algebraic Function, Derivative of Trigonometric Functions, partial derivative.

Unit - IVStatistics: 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	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 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, Implementingpolymorphism.

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	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 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: 2nd	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 website using HTML5 and CSS3 to demonstrate responsive web design.
2. Develop simple web application
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
Stream: Web Development
L T P Total Credits
0 0 12 12

Internal: 30 Marks
External: 20 Marks
Total: 50 Marks

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( ) whichaccepts 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. Writea main function to add two COMPLEX objects.
8. Create a 'MATRIX' class of size m X n. Overload the '+' operator to addtwo 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 displaythe 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 implementthe 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 ascommand line argument.
21. Define a function template for finding the minimum value contained in an array. Write main( ) function to findthe 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
PCC-WD-305	COMPUTER GRAPHICS LAB	0	6	6

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
HTML & CSS
Paper Code: PCC-WD-301

Semester: 3rd	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 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	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 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	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. 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	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 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

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
COMPUTER GRAPHICS LAB
Paper Code: PCC-WD-305

Semester: 3rd	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. Understand 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. Familiar with understand clipping techniques.

List of Practicals:

1.Study of basic graphics functions defined in"graphics.h".

2.Write a program to draw a hut or another geometrical figures.

3.Write a program to draw a line through Bresenham's Algorithm.

4.Write a program to draw a line using DDA algorithm.

5.Write a program to draw a line using Mid–Point algorithm.

6.Write a program to draw a circle using mid–point algorithm.

7.Write a program to draw an Ellipse using Mid–Point algorithm.

8. Write a program to rotate a Circle around any arbitrary point or around the boundary of another circle.

9. Write a menu driven program to rotate, scale and translate a line point, square, triangle about theorigin.

10. Write a program to perform line clipping.

11. Write a program to implement reflection of apoint,line.

12. Write a program to perform shearing on a line.

13. Write a program to implement polygon filling.

14. Write a program to draw a tfexagon on the Screen.

15. Write a program to implement transformations in three dimensions.

SEMESTER – IV

SCHEME

Paper Code	Paper	L	T/P	Credits
BSC-401	SOFT SKILLS	3	0	3
PCC-WD-401	OPERATING SYSTEM-II	3	0	3
PCC-WD-402	CORE JAVA	3	0	3
PCC-WD-403	MULTIMEDIA TECHNOLOGY	3	0	3
PCC-WD-404	COMPUTER WORKSHOP	0	18	18
OJT-WD-401	ON JOB TRAINING	0	30	30

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
ON JOB TRAINING

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

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
MULTIMEDIA TECHNOLOGY
Paper Code: PCC-WD-403

Semester:4th	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 Design and develop various Multimedia Systems applicable in real time.
2. To learn various multimedia authoring systems.
3. To understand various networking aspects used for multimedia applications.
4. To develop multimedia application and analyze the performance of the same.

Course Contents:

Section A

Basics of Multimedia Technology: Computers, communication and entertainment; multimedia an introduction; framework for multimedia systems; multimedia devices; CD- Audio, CD-ROM, CD-I, presentation devices and the user interface; multimedia presentation and authoring; professional development tools; LANs and multimedia; internet, World Wide Web & multimedia distribution networkATM & ADSL; multimedia servers & databases; vector graphics; 3D graphics programs; animation techniques; shading; anti aliasing; morphing; video on demand.

Section B

Image Compression & Standards: Making still images; editing and capturing images; scanning images; computer color models; color palettes; vector drawing; 3D drawing and rendering; JPEG-objectives and architecture; JPEG-DCT encoding and quantization, JPEG statistical coding, JPEG predictive lossless coding; JPEG performance; overview of other image file formats as GIF, TIFF, BMP, PNG etc.

Section C

Audio & Video: Digital representation of sound; time domain sampled representation; method of encoding the analogsignals; subband coding; fourier method; transmission of digital sound; digital audio signal processing; stereophonic & quadraphonic signal processing; editing sampled sound; MPEG Audio; audio compression & decompression; brief survey of speech recognition and generation; audio synthesis; musical instrument digital interface; digital video and image compression; MPEG motion video compression standard; DVI technology; time base media representation and delivery.

Section D

Virtual Reality: Applications of multimedia, intelligent multimedia system, desktop virtual reality, VR operating system, virtual environment displays and orientation making; visually coupled system requirements; intelligent VR software systems. Applications of environment in various fields.

Key Learning Outcomes

1. Develop various Multimedia Systems applicable in real time.
2. Design interactive multimedia software.
3. Apply various networking protocols for multimedia applications.
4. To evaluate multimedia application for its optimum performance.

Reference Books:

1. An introduction, Villamil & Molina, Multimedia Mc Milan, 1997
2. Multimedia: Sound & Video, Lozano, 1997, PHI, (Que)

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
OPERATING SYSTEM-II
Paper Code: PCC-WD-401

Semester:4th	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 learn about threads and synchronization.
2. To learn various methods of deadlock.
3. To understand the concept of virtual memory.
4. To general understanding of structure of modern computers.

Course Contents

UNIT-I

Os and synchronization: Introduction to os, Inter Processcommunication(IPC),threads, single level thread, multilevel threads, types of threads.Introduction, race condition, the critical section problem, solution to critical section problem, algorithm 1, algorithm 2, algorithm 3, bakery algorithm,synchronization hardware, semaphores,classic problems of synchronization.

UNIT_II

Deadlock: Introduction, system model, cause of deadlock, necessary conditions of deadlock, Resource Allocation Graph(RAG), RAG with cycle but no deadlock, methods for handling deadlock, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, starvation.

UNIT_III

Virtual memory & I/O system: virtual memory concept,demand paging, advantages/disadvantages of demand paging, basic page replacement,page replacement algorithms,thrashing, cache memory organization.

I/O system:overview, I/O devices, I/O subsystem, I/O software, I/O buffering.

UNIT_IV

Disk storage:mass storage structure, disk storgae, disk performance parameters, need of disk scheduling,disk scheduling algorithms,Redundant Array of Independent Disks(RAID).

Protection and security:introduction to protection,protection goals, protection domain, access rights, access matrix implementation, need of security, authentication, program threats, system threats, threat monitoring.

Course Outcomes

1. Evaluate the requirement for process synchronization and coordination handled by operating system.
2. Identify use and evaluate the storage management policies with respect to different storage management technologies.
3. Identify the need to create the special purpose operating system.

Reference Books

1. Operating System Conceptsby Avi Silberschatz and Peter Galvin
2. Operating Systems: Internals and Design Principles by William Stallings
3. Operating Systems: A Concept-Based Approach by D M Dhamdhere

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
CORE JAVA
Paper Code: PCC-WD-402

Semester:4th	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 knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.
2. Understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms.
3. Understand the principles of inheritance, packages and interfaces.

Course Contents

UNIT-I

Java Language Basics: Introduction To Java, structure of java, Basic Features, Java Virtual Machine Concepts, Primitive Data Type And Variables, Java Operators, Expressions, Statements and Arrays,strings.

Methodology: Classes and Objects, Abstraction and Encapsulation, Inheritance, Method Overriding and Polymorphism.

UNIT-II

Object Oriented Concepts: Class and Objects, Creating objects , Assigning object reference variables; Introducing Methods, Static methods, Constructors , Overloading constructors; This Keyword; Using Objects as Parameters, Argument passing, Returning objects , Method overloading, Garbage Collection, The Finalize ( ) Method.

Inheritance and Polymorphism: Inheritance Basics, Access Control, Multilevel Inheritance, Method Overriding, Abstract Classes, Polymorphism, Final Keyword.

UNIT-III

Interfaces: Implementing Interfaces, Interface and Abstract Classes, Extends and Implements together .

Multithreading : Introduction , creating thread, extending the thread class, life cycle of thread, implementing the runnable interface, stopping and blocking a thread

UNIT-IV

Exceptions Handling : Exception , Handling of Exception, Using try-catch , Catching Multiple Exceptions , Using finally clause , Types of Exceptions, Throwing Exceptions, Writing Exception Subclasses.

Packages : Defining Package, Package naming, Accessibility of Packages **,** using Package Members.

Course Outcomes

1. Identify classes, objects, members of a class and relationships among them needed for a specificproblem
2. Write Java application programs using OOP principles and proper program structuring
3. Demonstrate the concepts of polymorphism and inheritance
4. Write Java programs to implement error handling techniques using exception handling

Reference Books

1. Programming in Java, E Balagurusamy
2. The Complete Reference JAVA, TMH Publication
3. Beginning JAVA, Ivor Horton, WROX Public.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
COMPUTER WORKSHOP
Paper Code: PCC-WD-404

Semester: 4th — Internal : 60 Marks
Stream: Web Development — External: 40 Marks
L T P Total Credits — Total: 100 Marks

0 0 18 18 — Duration of Exam: 3 Hours

Course Objectives

1: Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.

2: Understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms.

3: Understand the principles of inheritance, packages and interfaces.

Course Contents:

1. Calculator Program in Java
2. Factorial Program using Recursion
3. Fibonacci Series Program
4. Palindrome Program in Java
5. Permutation and Combination Program
6. Pattern Programs in Java
7. String Reverse Program in Java
8. Mirror Inverse Program in Java
9. Binary Search Program in Java
10. HeapSort Program in Java
11. Removing Elements from ArrayList
12. HashMap Program in Java
13. Circular LinkedList Program in Java
14. Java DataBase Connectivity Program
15. Transpose of a Matrix Program

Course Outcomes:

1. Knowledge of the structure and model of the Java programming language, (knowledge)
2. Use the Java programming language for various programming technologies (understanding)
3. Develop software in the Java programming language, (application)
4. Evaluate user requirements for software functionality required to decide whether the Java programming languagecan meet user requirements (analysis)

Reference Books:

1. Programming in Java, E Balagurusamy
2. The Complete Reference JAVA, TMH Publication
3. Beginning JAVA, Ivor Horton, WROX Public.

J.C BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT
SOFT SKILLS
Paper Code:BSC-401

Semester:4th	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 discuss communication and behavioural skills.
2. To learn about Innovation and Entrepreneurship.
3. To improve spoken English and ability to articulate ideas.
4. To improve formal writing skills

Course Contents

Unit -01

Entrepreneurship skills: Scope and advantages of self-employment; Entrepreneurial skills, values and attitudes; Characteristics of Successful Entrepreneurs; Identification of entrepreneur through Self-Assessment; Generating a Business Idea; Micro, small and medium enterprises, Creativity and idea generation; Understanding Consumer, Market Survey: Scope & Influence of publicity and advertisement.

Unit 02

Innovation: Meaning and Importance; Types of Innovation; Difference with Creativity, Invention and Discovery; Innovation and Entrepreneurship.

Unit 03

Communication skill: Motivation; Ethics; Time management; Facing job interviews; Barriers to Effective Communication.

Unit -04

Writing Skills: Listening, speaking and reading:- Greetings and introductions, Telephone skills, Office Hospitality; Writing:- Letter Writing, E-mail, Resume/CV.

Course Outcomes

1. To learn about communication and ways to avoid effective communication hindrances by giving attention to all elements involved.
2. To improve corporate skills 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.

Annexure – “B”

SCHEME OF EXAMINATION

And

SYLLABUS

For

POST GRADUATE DIPLOMA

In

YOGA SCIENCE AND NATUROPATHY

Offered by

J.C Bose University of Science & Technology, YMCA

Sector-6, Mathura Road, Faridabad, Haryana

SCHEME OF YOGA SCIENCE & NATUROPATHY

Year	First Semester		Second Semester	
	Course	**Credits**	**Course**	**Credits**
I	FOUNDATION OF YOGA	3	PATANJALI YOGSUTRA	3
	ANATOMY AND PHYSIOLOGY	3	NATUROPATHY	3
	HATHYOGA - SADHNA AND SIDDHANT	3	ALTERNATIVE THERAPY	3
	PRACTICAL	18	NATUROPATHY PRACTICAL	9
	YOGIC DIET AND HEALTH	3	YOGA PRACTICAL	9
	TOTAL	30	TOTAL	30
	Cumulative credits = 60 (PG Diploma)			

Detailed Curriculum

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: FUNDAMENTAL OF YOGA

PAPER CODE : PG-DYN-101

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

Course Objective:

1. Give an introduction of yoga and its important streams
2. Give a brief introduction of Indian Philosophy.
3. Give a brief history and the basis of different yoga .

Course contents:

UNIT-1. Meaning of yogas , different Definition of yoga , Aim and Purpose of yoga , Introduction of different Method of Yogic Practices, personality of yogi, outline of Indian philosophy .

UNIT-2. Formation of yoga in Upinshad and veda , Formation of yoga in geeta , Formation of yoga according to Yoga Sutra , Formation of Yoga according to Hath yoga , Format According to Buddhism and Jainism.

UNIT-3 Method of yoga →

Rajyog,Gyanyog,bhaktiyog,karamyog,ashtangyog,hathyog,mantrayog and layyog.

UNIT-4 A) Introduction of different yogi Maharshipatanjali , Gorakhnath , MaharshiDayanand ,Swami Vivekanand , Maharshi Raman , Shri Aurobindo , Maharshi Mahesh Yogi , Swami Kuvalayananda.

B) Introduction of yoga scriptures →Patanjali yoga sutra, Shree madbhagwatGeeta.

Course Outcomes:

1. Advanced Knowledge of diverse yoga therapy tools and practices.
2. Their appropriate application with practices that may include asana or pranayama, meditation and relaxation techniques

Reference Books:

1. Upanishad in yoga – PRO .Ishwar Bharadwaj .
2. Yoga Mahavigyan – Dr .Kamakhaya kumar.
3. Yog Sutra – DR Somveer Arya.

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: ANATOMY AND PHYSIOLOGY

PAPER CODE: PG-DYN-102

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

Course Objectives

1. Discussion of the concept of cells , tissues , skeletal system
2. Discuss anatomical and physiological effects of selected yoga practice and content

Course Contents:

Unit 1 :-Introduction of human body structure and function,structure and function of cell and tissue,structure and function of skeleton system and muscle system ,name and number of skeleton and muscles in human body.

Unit 2:- Process of blood circulation, structure of heart and its functions,blood group, define blood pressure,structure of respiratory system.

Unit 3:- Structure and function of digestive system,structure and function of excretory system, structure and function of endocrine system.

Unit 4:- Effect of different Asana , Pranayama, Mudra, Bandha, Shatkaram and Dhyan on the system of Cell, Tissues, Bones, Digestion, Endocrine , Nervous system and Blood –Circulation .

Course outcomes:

1. Knowledge of all part of body , its system function .
2. Knowledge of different organs function n how its connected with each others.

Reference Book:

1. Yoga therapy- Swami Shivanand |
2. Human Anatomy and Physiology- Dr. AnantPrakesh Gupta|

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA FARIDABAD

SUBJECT NAME: HATHYOGA
PAPER CODE: PG-DYN-103

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

Course Objectives:

1. To give and introduction of Hatha yoga.
2. To give and understanding of the pre-requisites of Hatha Yoga.
3. To introduce the principles of Hatha Yoga.
4. To introduce essential Hatha Yoga text.

Course Contents:-

Unit-1: Introduction and Meaning of Hatha Yoga, Authority of Hatha Yoga practices, Suitable time and place for practice, Diet of Hatha Yogi, Seeker elements and obstructing elements in yoga practice.

Unit-2: Introduction and meaning of Asana, Formation of Asana in Hatha Pardipika, formation Of Asana according to Gheranda samhita, benefit of Asana in different disease, type of Asana.

Unit-3: Introduction and Meaning of Pranayama, Formation of pranayama according to Hatha Pradipika, Formation of Pranayama according to GherandaSamhita, Role of pranayama in different diseases, type of pranayama.

Unit-4: Introduction and Meaning of Shatkarma, Benefits of Shatkrama, Process of Neti, Benefits and caution, Process of AganiSar, Benefits and caution, process of trataka(concentrated-Gazing)

Reference Books:

1. Hatha Yoga Pardipika- Swami Annant Bharti
2. GherandaSamhita- Dr. Raghvendra Sharma Raghav
3. Asana, Pranayama, Mudra, Bhandha–Bihar yogMunger

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: YOGIC DIET AND HEALTH

PAPER CODE: PG-DYN-104

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

Course Objectives:

1. Able to 1 Understand the concept of diet and the medical value of nutrition.
2. Advice appropriate diet to different age group and indifferent diseases.
3. Understand health definition according to season.

Course Contents:

Unit 1 Meaning and definition of yoga according to WHO,definition of health according to Sushrut Acharya and Charak Muni, Dincharya,Raatricharya and Ritucharya,base pillar of health(diet,celibacy,sleep).

Unit-2: Concept of disease, cause of disease, Symptoms and solution according to yoga (Constipation, backache, Cold and cough, Hyper-tension, low blood pressure, Asthma.)

Unit 3:- Meaning and definition of diet, the purpose of diet, balance diet, moderate diet, description of yogic diet(tamsik, rajsik, satvik).

Unit 4:- Definition and meaning of nutrition of important factor of nutrition (carbohydrate, vitamin, minerals, protein) nutrition according to age and disease, nutrition diet for pregnant women.

Course outcomes:

1. Understaned the meaning of health in life
2 Gain the knowledge about different disease ,
3. Knowledge about Balance diet , Nutrition and Moderate diet .

Reference Books;

1. yog and yogic therapy – Pro. Ramharsh singh|
2. yogic therapy- swami kulvlayanand|
3 yog and rog – swami satyanand sarswati|
4. sharir kirya and yogaabhyas- Dr.M.M.Gora|

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: YOGA PRACTICAL
PAPER CODE: PG-DYN-105

Semester -1st	Internal – 60 Marks
Stream– Yoga & Naturopathy	External – 40 Marks
L T P Total Credits	Total: 100 Marks
0 0 18 18	Duration of Exam: 3 Hours

Course Objectives:

1 .State techniques, Health benefits, applications precautions and Contraindication of under mention yogic practices.

2. To demonstrate and instruct under mentioned yogic practices.

Course contents :

SHAT KARMA (Cleansing process)
Jalneti (Nostile Cleansing) , RubberNeti, Vamankirya/kujankirya, Vatkarm, Viyutkaram, sheetkaram,
Kapalbhati , Nuli(BOYS).
ASANA : PADMASANA (lotus Pose) ,
VAJARASANA (Thunderbolt pose),
GOMUKHASANA(Cow's face pose)
ARDHMATSYENDRA(Spinal twist pose)
PASCHIMOTTANASANA(Back stretching pose)
USTRASANA(Camel pose)
HALASNA(plow pose)
SARVANGASANA(Shoulder Stand pose)
UTTANPADASANA(Standing Forward Bend)
MATSYANASANA(Fish Pose)
CHAKRAASANA(While Pose)
MARKATASANA(Monkey Twist Pose)
SETUBANDH(Bridge pose)
DHANURASANA(Bow pose)
TADASANA(Mountain pose)
SIRSHASANA(Head stand)
MAYURASANA(Peacock pose)
SALABHASANA(Locust pose)
SAVASANA(Corpse pose)
PRANAYAMA: BHASTRIKA, NADI SHODHANA, BHRAMRI, UJJAYI,
MUDRA-BHANDH:→ GYAN MUDRA, YOG MUDRA, VIPRITKARNI MUDRA, JALANDHAR BHANDH, MOOL BHANDH , UDDYAN BHANDH
SUN SALUTATION With Mantra

A Practical Notebook:→10 ASANA,3PRANAYAMA, 3MUDRABHAND and SUN SALUTATION→(Make notebook with self picture doing this all practices).

B ORAL:

1. Demonstrate basic skills associated with yoga activities including strength and flexibility, balance and coordination.
2. Demonstrate the ability to perform yoga movements in various combinations and forms.

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: PATANJALI YOGSUTRA
PAPER CODE: PG- DYN-201

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

Course Objectives:

1. Concept and Formation of Ishvara
2. Give a brief introduction of Samadhi
3. Give a brief introduction of Asthangyog

Course Contents:

Unit 1) Concept and formation of ishvara, prakruti and purush ,definition and meaning in yoga, chittabhumiya and chittavritti, assiduousness(Abhyasa) and imperturbability(vairagya),yogantaraya(obstacles), chittaprasadanam(helpful elements).

Unit 2) Type of Samadhi →Samprajnat and asamprajnat, ritambharapragya, kriyayog,punchkleshe,formation of sukh or dukh,vivek-khyatirsaptadhaprajna(pragya).

Unit 3) Asthangyog (Eight Fold Path)→ Formation and benefits of Yama, formation and benefits of Niyama, formation and benefits of asana, formation and benefits of pranayama, formation and benefits of pratyahara, formation and benefits of Dharana,formation and benefits of dhyana

Unit 4) Formation of antarang and samyamah, description of vibhuti, concept of kevalya, method to achieve kevalya

Course Outcomes:

1. Advanced Knowledge of diverse yoga therapy tools and practices.
2. Their appropriate application with practices that may include asana or pranayama , meditation and relaxation techniques.

Reference Books:

1. Patanjaliyog dhrasanam –Dr. Devi sahya Pandy deep|
2. Patanjali yog Pardeep – Geeta Press Gorakhpur|

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: NATUROPATHY

PAPER CODE: PG-DYN-202

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

Course Objectives:

1 Give an introduction of naturopathy and its important streams.
2 Give a brief history of naturopathy
3 Elaborate type of treatment related to disease in naturopathy

Course Content :

Unit 1) Meaning and definition of naturopathy, history of naturopathy, importance and basic principle of naturopathy, Acute and Chronic disease-Symptoms, diagnosis and naturopathy treatment.

Unit 2) Mud, Air and Sun therapy- Importance of mud, type and effect of mud therapy on body, types of mud, mud bath uses in treatment ways, importance and treatment uses of sun color, method of Sun bath, tie and precaution, benefits of air bath, method of treatment by air and its precautions.

Unit 3)A**Fast**→ Definition and meaning of fast and basic principle of fast, type of fasting-long,short,ful,waerfasting,juice fasting, fruit fasting, rules of fasting, fasting for wellness.
B)Massage → Definition, meaning of massage, principle of message, type(scientific and ayurvedic),different method of massage-normal,friction,slap,tap,pinchetc, treatment method and precaution of massage.

Unit 4) Water treatment → Definition and meaning of water treatment, purpose and importance of water, quality effect of different temperature on body, normal bath, naturalbath, frictionbath, katibath, mehan bath , steam bath, spine bath, foot bath, Enema-method, benefit and precaution, benefit of water in health wellness, water treatment used in different disease

Course Outcomes:

1. Advanced knowledge of diseases and regulatory health issues.
2. Advance knowledge of generally accepted ethical principles of health care, yoga and naturopathy.
3. Knowledge of refreshing body by natural way.
4 Skill to Provide Yoga therapy.

Reference Books:

1. History and philosophy of Naturopathy – Dr. S.j.Singh|
2. Natur Cure – Dr. H . K . Bakhru|
3. The Practice of Nture Cure –Dr . Henery Lindlahar|

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: ALTERNATE THERAPY

PAPER CODE: PG-DYN-203

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

Course Objectives:

1 Give brief introduction of alternative therapies.
2 Introduce to Accupressure therapy, Magnet therapy and Reki and Mantra therapy.
3 To treatment through alternative therapies.

Course Contents:

Unit 1) Meaning of disease, definition, cause and type of disease,symptoms of phsycially,mentally and spiritually sick person and healthy person, origin of alternative therapies, concept of alternative therapies, importance and types of alternative therapies.

Unit 2) Acupressure → History of acupressure,meaning and definition of acupressure,type of acupressure,principle and rules of acupressure,method of acupressure,tools of acupressure quality and treatment of acupressure,precaution in acupressure.

Unit 3) Magnet therapy → History of magnet therapy,meaning of magnet and magnet field,quality of magnet,type of magnet,type of magnet therapy,method of magnet therapy, principle and precaution of magnet therapy,benefit and effect of magnet therapy.

Unit 4) A Reki Therapy → History of Rekitherapy,meaning and concept of Rekitherapy,rules of Rekitherapy,helping tools of Rekitherapy,method of Rekitreatments,benefits and limitaions of Reki therapy.

B Mantra Therpay → Meaning of mantra, definition and formation of mantra, type of mantra,main source or part of mantra,type of mantra chanting,rules of mantra chanting for beginners ,the scientific view of mantra and different mantra effects.

Course Outcome :

1. knowledge of classical theories of health and disease relevant to the practice of yoga therapy
2. knowledge of human anatomy, physiology and biomechanics and the interrelationship between system of the body, knowledge of common pathologies and disorders of system of body, including familiarity with symptoms, condition management, illness trajectiories and related contraindication to yoga practices

Reference Books:

1. Alternative therapy –Dr.R.H.Vivak|
2. Alternative therapy Method- Dr .Rajkumar Puruthi|
3 Acupresser Naturopathy therapy – Dr. Attar Singh |
4. Megnet Therapy –Dr.Hiralal Bansal |

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: NATUROPATHY PRACTICAL

PAPER CODE: PG-DYN-204

Semester -2nd	Internal – 60 Marks
Stream– Yoga Science & Naturopathy	External – 40 Marks
L T P Total Credits	Total: 100 Marks
0 0 9 9	Duration of Exam: 3 Hours

Course Objectives:

1 State technique, health benefits, applications, precautions and contradiction of under mentioned yogic practices.

2 To demonstrate and instruct under mentioned yogic practices

Course Contents

1 Water therapy Bath-katibath (hot,cold,natural),steam bath, spinal spray, spinal bath, foot bath cold and hot Enema-natural water,coldwater,warm water. Wetstrip-full body, chest, neck, hand and leg.

2. Mud Therapy : Mud strip-chest,abdomen,eyes,forehead,ear,neck. Lape-full body mud lape (ranjbath,wet mud bath).

3. Sun therapy: Sun bath through with its color.

Course Outcomes:

1. Demonstrate an understanding of health-related fitness components: Cardiorespiratory endurance, flexibility and body composition.
2. Demonstrate an understanding of health problems associated with adequate fitness levels demonstrate an understanding of sound nutritional practices as related to health and physical performance.
3. Knowledge of the interconnection between the body, the breathe, the mind and emotions in the context of maintaining resilience and well- beings

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: YOGA PRACTICAL

PAPER CODE: PG-DYN-205

Semester -2nd — Internal – 60 Marks

Stream– Yoga Science & Naturopathy — External – 40 Marks

L T P Total Credits — Total: 100 Marks

0 0 9 9 — Duration of Exam: 3 Hours

Course Objectives :

1. To enable the student to have good health.
2. To practice mental hygiene.
3. To possess emotional stability .
4. To integrate moral values .

Course Content:

.	STANDING POSE	Natrajasana, Bird pose,Viman Asana ,Warrior pose,Raised Arms Pose, triangle pose
	SITTING POSE	Fetus pose,Embryo in womb pose,ExtendedFrongPose,Ak Pad Shikandasana,Plow Pose, Cow Face pose, Spinal twist Pose, Back Stretching Pose, camel pose
	PRONE POSE	Kurmasan ,Cobra pose,Bow pose , shalbhasan
	SUPINE POSE	Supine Thunder bolt pose ,Bridge pose,sarvangasana,PlowPose,Fish Pose
	BALANCE POSE	UttithKurmasana, padambakasana, padammayurasana,Scorpio,Monkey twist pose,titibhasana
	PRANAYAMA	Bhastrika, Nadhishodhan,Bhramri,ujjayi
	MUDRA	Yogmudra,Gyanmudra,VipreetKarnimudra,kakimudra,sambhavimudra ,prithvimudra, Vayumudra, jal mudra
	Shat Karm	Vattkarm,vayuktkarm,shetkarm,kaplabharti,dhotisutra,neti,kunjal
3	Practical Notebook	Make the self picture yoga notebook under the instructions of yoga teac her

Course Outcomes

1. Demonstrate basic skills associated with yoga activities including strength and flexibility, balanceand coordination.
2. Demonstrate the ability to perform yoga movements in various combinations and forms.
3. Demonstrate the ability to create and present various yoga sequences.

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: GENERAL PSYCHOLOGY

PAPER CODE: PG-DYN-206

Semester :	Sessional – 25 Marks
Stream– Yoga Science& Naturopathy	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1.Brief History of modern Psychology with Yogic applications.

2.Major Perspectives in Modern Psychology.

3.Key data collection methods in psychology .

Course Contents:-

Unit-1: **PSYCHOLOGY:A SCIENCE OF BEHAVIOUR:-** Meaning ,Definition & Types of Psychology ;Nature & Characteristics of Psychology; Psychology as a Science of Behaviour ;Defination of Behaviour

Unit-2: **MENTAL HEALTH :-** Means of mental health; Positive Mental Health; Causes and Consequences of conflicts and Frustrations; Introduction to common mental disorders; depressive disorder,anxiety disorders;sleep disorders,mental retardation.

Unit-3: **PERSONALITY AND ITS DEVELOPMENT:-** Personality: Nature and Types of Personality; Yoga and Personality- Yogic View of Personality; Personality Development with special emphasis on Panchakosha and Asthanga Yoga

Unit-4: **Psychiatric disorders and its Yogic management :-** Neurosis, Psychosis,Depression,Anxiety,Stress,Phobia,Obsessive Compulsive Disorder(OCD),

Course Outcomes:-

1. To introduce students to the basic concepts of the field of psychology with an emphasis on applications of yoga in everyday life.
2. Imparting knowledge of basic psychological concepts and models,and developing ability to apply this knowledge in Yogic therapy.
3. Encouraging self understanding,reflection and personal growth.

Reference Books:

1. Internal Yoga Psychology – V.Madhupudan Reddy
2. Yoga Psychology – Shanti Parkash Attari
3. Yoga and Yogic Therapy- Ram Harsh Singh
4. Inroduction to Psychology- Shashi Jain

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: YOGA PHILOSOPHY

PAPER CODE: PG-DYN-206

Semester :	Sessional – 25 Marks
Stream– Yoga Science& Naturopathy	Theory – 75 Marks
L T P Total Credits	Total: 100 Marks
3 0 0 3	Duration of Exam: 3 Hours

Course Objectives:

1. Explain the hidden concepts of available in the ancient yogic texts.
2.Understand the yogic principles of yoga therapy.
3.Appreciate the contribution of yogis
4.Understand the fold of afflictions and means to overcome them.

Course Contents:-

Unit-1: Introduction to Vedas and Upanishads:Jnanakanda-Prasthana traya,Upanishad(Taittiriya,katha,Mandukya),Yoga vashistha

Unit-2: Darshan:- Ashtika Darshan(Sankhya-Yoga,Naya-Veiseshika,Mimansa-Vedanta) Nashkita Darshan (Charvaka, Jain, Boudha)

Unit-3: Concept of Dharma:-Literal meaning of dharm; Naya Vs Dharma,Varna and Ashrama Dharma.

Unit-4: Fundamental concept of Bhagvad gita:- Shrimad Bhagvad gita and its background ;Neccessity of gita teaching ;Understanding the truth about self and supreme,Concept of Karma yoga,Gyanyoga,Bhaktiyoga.

Course Outcomes:-

1. The essence of Vedas and Upanishad will be understood .
2. Students will be in a position to appreciate the yogic way of living.
3. Bhagvad gita emphasis on deep truth and thus helps in attending to the responsibilities.

Reference Books:

1. The Vedas –by Chandersekharandera Saraswati.
2. Yoga its basic and applications –by H.R.Nagender—SVYP
3. Bhartiya Darshan ki ruprekha- by Prof. Harender Prasad Sinha
4. Indian philosophy- by Dr. Sobha Nigam

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 PG Diploma in Yoga Science and Naturopathy (program Code: 270)
Revised Scheme Course Index of the year 2019-2020(BOS Dated 24/10/2019)
Mapping of the course with the employability/Entrepreneurship/Skill Development

S.NO	Course	Code	Skills Development	Entrepreneurship	Employability
1	FOUNDATION OF YOGA	PG-DYN-101	√		√
2	ANATOMY AND PHYSIOLOGY	PG-DYN-102	√		√
3	HATHYOGA - SADHNA AND SIDDHANT	PG-DYN-103	√		√
4	PRACTICAL	PG-DYN-105	√	√	√
5	YOGIC DIET AND HEALTH	PG-DYN-104	√		√
6	PATANJALI YOGSUTRA	PG-DYN-201	√		√
7	NATUROPATHY	PG-DYN-202	√		√
8	ALTERNATIVE THERAPY	PG-DYN-203	√		√
9	NATUROPATHY PRACTICAL	PG-DYN-204	√	√	√
10	YOGA PRACTICAL	PG-DYN-205	√	√	√

Principal, CCSD

Annexure – “C”

SCHEME OF EXAMINATION

And

SYLLABUS

For

POST GRADUATE DIPLOMA

In

DATA SCIENCE & ANALYTICS

Offered by

J C Bose University of Science & Technology YMCA

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

J C Bose University of Science & Technology YMCA

VISION

J C Bose University of Science & Technology YMCA aspires to be a nationally and internationally acclaimed leader in technical and higher education in all spheres which transforms the life of students through integration of teaching, research and character building.

MISSION

- To **contribute** to the development of science and technology by synthesizing teaching, research and creative activities.
- To **provide** an enviable research environment and state-of-the art technological exposure to its scholars.
- To **develop** human potential to its fullest extent and make them emerge as world class leaders in their professions and enthuse them towards their social responsibilities.

Community College of Skill Development

VISION

"**Community College of Skill Development** aspires to be a national leader in skill development in all spheres which **transforms** the life of students through the integration of skill, training and character building."

MISSION

- To **provide** an academically conducive environment, to **generate** future leaders and professionals of 21st Century.
- To **nurture** talent of underprivileged section of the society and **transforms** the lives of millions through academic excellence.
- To **incorporate** specific need-based education and training opportunities for skill up gradation.

About Program

- PG DIPLOMA IN DATA SCIENCE & ANALYTICS is a one year post graduate program which is designed with an aim to provide the students in depth knowledge of various advanced concepts of data science.
- This comprehensive curriculum covers the concepts of Data Analytics and Statistics foundation, analyzing data using Python and R programming languages, interacting with databases using SQL, visualizing the data using Tableau and Power BI and Machine Learning and deep learning using python.
- This Post Graduate Program in Data Analytics has been developed by industry experts to help you learn the applications of data science from scratch and build powerful models to generate useful business insights and predictions. It has been designed for fresher and budding professionals looking to build their career in Data Science & Analytics. This program comes with a job placement guarantee and provides complete placement support to prepare learners for future job opportunities.

PROGRAM EDUCATION OBJECTIVE

PEO1	To enhance the competence level for tackling real world problems in industry, academia and research organizations
PEO2	To sharpen problem solving ability using in depth analysis based upon stateof-the-art concepts and technology
PEO3	To create awareness about professional ethics, multidisciplinary approach, entrepreneurial thinking and effective communication.

PROGRAM OUTCOMES

PO1	Ability to describe the current state of reality for organizations by translating data into information accessible to the business.
PO2	Ability to identifying new sources of data and methods to improve data collection, analysis, and reporting.
PO3	Ability to plans, implements, and assesses high-level statistical models and strategies for application in the business's most complex issues.
PO4	Ability to develops econometric and statistical models for various problems including projections, classification, clustering, pattern analysis, sampling and simulations
PO5	Ability to perform a vital role in the advancement of innovative strategies to understand the business's consumer trends and management as well as ways to solve difficult business problems, for instance, the optimization of product fulfillment and entire profit.

PROGRAM SPECIFIC OUTCOMES

PSO1	Analyzing data using statistical techniques and providing reports
PSO2	Developing and implementing databases and data collection systems
PSO3	Acquiring data from primary and secondary sources and maintain data systems
PSO4	Identifying, analyzing, and interpreting trends or patterns in complex data sets . Filtering and cleaning data.
PSO5	Effectively technology like soft Computing and machine learning to improve the prevalent solutions

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD
COMMUNITY COLLEGE OF SKILL DEVELOPMENT

SCHEME OF POST GRADUATE DIPLOMA IN DATA SCIENCE & ANALYTICS

FIRST SEMESTER

SUBJECT CODE	SUBJECT NAME	CREDITS
PG-DSA-101	INTRODUCTION TO DATA SCIENCE & MACHINE LEARNING	4
PG-DSA-102	STATISTICS & PROBABILITY	4
PG-DSA-103	ADVANCED DATABASE MANAGEMENT SYSTEM	4
PG-DSA-104	DATA STRUCTURES & ALGORITHMS	4
PG-DSA-105	PYTHON LAB	8
PG-DSA-106	R PROGRAMMING LAB	3
PG-DSA-107	SQL LAB	3
TOTAL		30

SECOND SEMESTER

SUBJECT CODE	SUBJECT NAME	CREDITS
PG-DSA-201	FUNDAMENTALS OF DATA SCIENCE	4
PG-DSA-202	ELEMENTS OF STATISTICAL LEARNING	4
PG-DSA-203	MACHINE LEARNING	4
PG-DSA-205	MATHEMATICS	4
PG-DSA-206	MACHINE LEARNING LAB	3
PG-DSA-207	PYTHON LAB	3
PG-DSA-208	MINOR PROJECT	4
PG-DSA-204	DEEP LEARNING	4
TOTAL		30

Detailed Curriculum

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: INTRODUCTION TO DATA SCIENCE & MACHINE LEARNING

PAPER CODE: PG-DSA-101

Semester -1st	Sessional – 25 Marks
Stream - Data Science & Analytics	Theory – 75 Marks
L T P Total Credits	Total - 100 Marks
4 0 0 4	Duration of Exam: 3 Hours

Course Objectives:

1. Key concepts in data science, including tools, approaches, and application scenarios
2. Topics in data collection, sampling, quality assessment and repair
3. Topics in statistical analysis and machine learning

Course Contents:

UNIT-1

Overview of Data Science : Data Science incorporates various Discipline , Data Science Importance , Data Science Process , Data Science Life Cycle , Data Science Applications and Use Cases , Challenges in Data Science , Data Science Team , Data Science tools and Platforms.

UNIT-2

Mathematical Computing: Knowledge on Packages like The numpy Library- numpy, ndarray, dtype, Intinsic creation of array,Difference between list and numpy array , Indexing, Slicing, and Iterating**,** numpy functions for linear algebra operation , statistical operation , string operation ,

UNIT -3

Pandas: Introduction to pandas Data Structures, Data series, Data frame, Index object, Other Functionalities on Indexes, Function Application and Mapping, Data Preparation, Concatenating, Data Transformation, Discretization and Binning, String Manipulation, Data Aggregation, Group Iteration.

UNIT-4

Data Visualization: The matplotlib and seaborn library , Plot , Scatter plot, Bar Graph , Histogram , Pie Chart, Factorplot, Boxplot, VoilinPlot, Stripplot, Swarmplot, barplot, Countplot, Distplot, JointPlot, PairPlot, RugPlot, Kdeplot, PairGrid, Pairplot, FaceGrid, Heatmap.

UNIT-5

Scipy- File input/output, special function, Linear algebra operations, Interpolation, Optimization and fit, Statistics and random numbers, Numerical integration, Fast Fourier transformations,

Course Outcomes:

1. Manipulate large data sets and use them to identify trends and reach meaningful conclusions to inform strategic business decisions.

2. Clean, aggregate, and organize data from disparate sources and transfer it to data warehouses.

3. Visualize data using python module.

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: STATISTICS & PROBABILITY

PAPER CODE: PG-DSA-102

Semester -1st	Sessional – 25 Marks
Stream–Data Science & Analytics	Theory– 75 Marks
L T P Total Credits	Total: 100
Marks	
4 0 0 4	Duration of Exam: 3 Hours

Course Objectives:

The main objective of this course is to provide students with the foundations of probabilistic and statistical analysis mostly used in varied applications in engineering and science like disease modeling, climate prediction and computer networks etc.

Course Content:

Unit-1

Introduction to data, descriptive statistics, basic concepts of statistics, sampling, Define probability, conditional probability, Baye's theorem, random variables.

Unit-2

Randomization, case studies of randomization, Hypothesis testing, simulation case studies, central limit theorem, Normal distribution

Unit-3

Inference for a single proportion, difference of two proportions, Testing for goodness of fit using chi-square, testing for independence in two-way tables, T- distribution, difference of two means, compairing many means with ANOVA.

Unit-4

Line fitting, residuals and correlation, fitting a line by least squares regression, types of outliers in linear regression, multiple regression, logistic regression.

Course Outcomes:

1. How to calculate and apply measures of location and measures of dispersion -- grouped and ungrouped data cases.
2. How to apply discrete and continuous probability distributions to various business problems.
3. Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases. Understand the concept of p-values.
4. Learn non-parametric test such as the Chi-Square test for Independence as well as Goodness of Fit.

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: ADVANCED DATABASE MANAGEMENT SYSTEM

PAPER CODE: PG-DSA-103

Semester -1st	Sessional – 25 Marks
Stream–Data Science & Analytics	Theory– 75 Marks
L T P Total Credits	Total: 100
Marks	
4 0 0 4	Duration of Exam: 3 Hours

Course Objectives:

To provide strong foundation for database application development, introduce key aspects of emerging database technology.

Course Contents:

Unit-1

Introductory concepts of DBMS:

Introduction and applications of DBMS, Purpose of data base, Data Independence, Database System architecture- levels, Mappings, Database, users and DBA.

Unit-2

Database System Architecture:

Three Level Architecture of DBMS, The External Level or Subschema, The Conceptual Level or Conceptual Schema, The Internal Level or Physical Schema, Data Definition Language, Data Manipulation Language; Database Management System Structure, Database Manager, Database Administrator, Data Dictionary,Client / Server Architecture

Entity-Relationship: Basic concepts, Design process, constraints, Keys, Design issues, E-R diagrams, weak entity sets, extended E-R features – generalization, specialization, aggregation, reduction to E-R database schema.

Unit-3

Relational Algebra model:

Relational Algebraic Operations, Basic Operations, Union, Difference, Cartesian Product, Intersection, projection, selection, join, division.

Unit-4

Functional Dependency – definition, trivial and non-trivial FD, closure of FD set, closure of attributes, irreducible set of FD, Normalization – 1Nf, 2NF, 3NF, Decomposition using FD- dependency preservation, BCNF, Multi- valued dependency, 4NF, Join dependency and 5NF

Unit-5

Concurrency Control

Serializability: Serializability by Locks, Locking Systems With Several, Lock Modes, Architecture for a Locking Scheduler Managing Hierarchies of Database Elements, Concurrency Control by Timestamps, Concurrency Control by Validation, Database recovery management

Unit-6

Transaction processing:

Introduction of transaction processing, advantages and disadvantages of transaction processing system, online transaction processing system, serializability and recoverability, view serializability, resolving deadlock, distributed locking.

Transaction management in multi-database system, long duration transaction, high-performance transaction system.

Unit-7

Parallel and Distributed Databases:

Database Architectures for parallel databases, Distributed Databases and Object Oriented Databases. Distributed Database Introduction of DDB, DDBMS architectures, Homogeneous and Heterogeneous databases, Distributed data storage, Overview of object: oriented paradigm, OODBMS architectural approaches, Object identity, procedures and encapsulation, Object oriented data model: relationship, identifiers, Basic OODBMS terminology, Inheritance.

Unit-8

Data warehouse and data mining:

Introduction to Data Warehousing – Concepts, Benefits and Problems, DW Architecture – Operational Data, load manager, meta data, DW Data flows – inflow, upflow, meta flow, DW tools and technologies – Extraction, cleansing and transformation tools, On-line Analytical Processing ,Data mining techniques.

Course Outcome:

1. Create Stored Database Procedures for writing consistent, well-tuned backend code.
2. Develop database application using XML data model.
3. Understand developments in database technologies.

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: DATA STRUCTURES & ALGORITHMS

PAPER CODE: PG-DSA-104

Semester -1st	Sessional – 25 Marks
Stream–Data Science & Analytics	Theory– 75 Marks
L T P Total Credits	Total: 100
Marks	
4 0 0 4	Duration of Exam: 3 Hours

Course Objectives:

1. To impart the basic concepts of data structures and algorithms.
2. To understand concepts about searching and sorting techniques
3. To understand basic concepts about stacks, queues, lists, trees and graphs.
4. To enable them to write algorithms for solving problems with the help of fundamental data structures

Course Content:

Unit-1

INTRODUCTION

Basic Terminologies: Elementary Data Organizations, Data Structure Operations: insertion, deletion, traversal etc.; Analysis of an Algorithm, Asymptotic Notations, Time-Space trade off.

Searching: Linear Search and Binary Search Techniques and their complexity analysis.

Unit-2

STACKS AND QUEUES

Stack and its operations: Algorithms, Applications of Stacks: Expression Conversion and evaluation – corresponding algorithms and complexity analysis. Queue, Types of Queue: Simple Queue, Circular Queue, Priority Queue; Operations on each type of Queues: Algorithms and their analysis.

Unit-3

LINKED LISTS

Singly linked lists: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list; Linked representation of Stack and Queue, Doubly linked list: operations on it and algorithmic analysis; Circular Linked Lists: all operations their algorithms and the complexity analysis.

Unit-4

Trees: Basic Tree Terminologies, Different types of Trees: Binary Tree, Threaded Binary Tree, Binary Search Tree, AVL Tree; Tree operations on each of the trees and their algorithms with complexity analysis. Applications of Binary Trees, B Tree, B+ Tree: definitions, algorithms and analysis.

Unit-5

SORTING AND HASHING

Objective and properties of different sorting algorithms: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort; Performance and Comparison among all the methods. Hashing and collision resolution.

Unit-6

Graph: Basic Terminologies and Representations, Graph search and traversal algorithms and complexity analysis.

Course Outcomes:

1. Understanding the core terms, concepts, and tools of relational database management systems.
2. Understanding database design and logic development for database programming.

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: PYTHON LAB

PAPER CODE: PCC-WD-105

Semester 1st	Internal – 30 Marks
Stream– Data Science & Analytics	External – 20 Marks
L T P Total Credits	Total - 50 Marks
0 0 8 8	Duration of Exam: 3 Hours

Course Objectives:

1. To write, test, and debug simple Python programs.
2. To implement Python programs with conditionals and loops.
3. Use functions for structuring Python programs.
4. Represent compound data using Python lists, tuples, dictionaries.
5. Read and write data from/to files in Python.

Course Contents:

Unit-1

Fundamental of python:

Introduction to Python , Running Python Programs, Writing Python Code , Data Types and Variables, Numeric Variables, String Variables,Standard Data Types Printing with Parameters, Getting Input from a User , String Formatting, Multiple Variable Assignment, Type Conversion.

Unit-2

Python Operators and Operands:

Arithmetic, Assignment, Comparision , logical ,Membership ,Identity operators , operator Precedence, Evaluating Expressions.

Unit-3

Making Decisions and loop statement:

Logical Expressions , The "if" Statement , Logical Operators , More Complex Expressions, while loop, for loop , Pattern using for loop.

Unit-4

Python Strings:

Accessing Values in Strings, Slicing of the string, Various String Operators, Predefined Function for string, Reverse of the string.

Unit-5

Python List:

Define a list, List indices, Traversing a list, List operations, slices and methods, Map, filter and reduce, Deleting elements of list , Nested list.

Unit-6

Python Tuple:

Advantages of Tuple over List, Packing and Unpacking, Comparing tuples, Creating nested Tuple, Using tuples as keys in dictionaries, Deleting Tuples, Slicing of Tuple, Tuple Membership Built-in functions with Tuple

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- **Unit-7**

Python Set:

create a set, Iteration Over Sets, Python Set Methods, Python Set Operations, Union of sets, Built-in Functions with Set, Python Frozenset.

Unit-8:

Python Dictionary:

create a dictionary, PYTHON HASHING, Python Dictionary Methods, Copying dictionary, Updating Dictionary, Delete Keys from the dictionary, Dictionary items() Method, Sorting the Dictionary , Dictionary in-built Functions, len() Method

Unit-9

Python Functions:

What is a function, How to define and call a function in Python, Types of Functions, Significance of Indentation (Space) in Python, Function Return Value, Types of Arguments in Functions, Default Arguments and Non-Default Arguments, Keyword Argument and Non-keyword Arguments, Arbitrary Arguments, Rules to define a function in Python, Various Forms of Function Arguments, Nested Functions, Call By Value, Call by Reference, Anonymous Functions/Lambda functions, Passing functions to function, map(), filter(), reduce() functions, Docstring, Iterators, Generators, Closures, Decorators.

Course Outcomes:

1. Write, test, and debug simple Python programs.
2. Implement Python programs with conditionals and loops.
3. Develop Python programs step-wise by defining functions and calling them.
4. Use Python lists, tuples, dictionaries for representing compound data.
5. Read and write data from/to files in Python.

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J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: R PROGRAMMING LAB

PAPER CODE: PCC-WD-106

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

Course Objectives

1. Master the use of the R interactive environment
2. Expand R by installing R packages
3. Explore and understand how to use the R documentation
4. Read Structured Data into R from various sources
5. Understand the different data types in R

Course Contents:

1. Understanding of R System and installation and configuration of R-Environment and R-Studio
2. Understanding R Packages, their installation and management
3. Understanding of nuts and bolts of R:
    a. R program Structure
    b. R Data Type, Command Syntax and Control Structures
    c. File Operations in R
4. Application of R Programming in Daily life problems
5. Preparing Data in R
    a. Data Cleaning
    b. Data imputation
    c. Data conversion
6. Visualizing data using R with different type of graphs and charts
7. Applying R Advance features to solve complex problems.

Course Outcomes:

1. Understand confounding and adjustment in multivariate models
2. Understand interaction in multivariate models
3. Predict/Score new data using models
4. Understand basic non-linear functions in models
5. Understand how to link data, statistical methods, and actionable questions

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SUBJECT NAME: SQL LAB

PAPER CODE: PCC-WD-107

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

Course objective:

1. To learn the concepts of Relational Database Management System
2. To have the hands of experience on SQL using Microsoft Server Management Studio
3. To learn and practice various SQL queries.

Course contents:

1. Details about SQL Fundamentals
2. What is a database? What is SQL?
3. Introduction to Microsoft SQL server and Management studio.
4. How To Create A Database & SQL DataTypes
5. How to use Alias in SQL
6. How to use SELECT in SQL
7. How to query data using Where clause in SQL
8. How to use Insert Into in SQL
9. How to Delete & Update data in SQL
10. How To Create A Database & SQL DataTypes
11. How to use SELECT in SQL
12. How to query data using Where clause in SQL
13. How to use Insert Into in SQL
14. How to Delete & Update data in SQL
15. How sorting is done in SQL using ORDER BY, DESC and ASC
16. How to use Group By in SQL
17. How to use Wildcards in SQL
18. Using Regular Expressions & Wild Cards in SQL
19. Use of Null value & Keyword in SQL
20. How to use Alter, Drop & Rename function in SQL
21. How to use Limit keyword in SQL
22. How to use Joins in SQL
23. How to use Unions in SQL
24. How to use Index in SQL

Course Outcomes:

1. Install, configure, and interact with a relational database management system.
2. Describe, define and apply the major components of the relational database model to database design Learn and apply the Structured Query Language (SQL) for database definition and manipulation
3. Define, develop and process single entity, 1:1, 1:M, and M:M database tables

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: FUNDAMENTALS OF DATA SCIENCE

PAPER CODE: PG-DSA-201

Semester -2nd	Sessional – 25 Marks
Stream–Data Science & Analytics	Theory– 75 Marks
L T P Total Credits	Total: 100
Marks	
4 0 0 4	Duration of Exam: 3 Hours

Course Objectives:

1. Describe the Data Science Process and how its components interact.
2. Use APIs and other tools to scrap the Web and collect data.
3. Apply EDA and the Data Science process in a case study.
4. Describe what Data Science is and the skill sets needed to be a data scientist

Course Contents:

UNIT-1

Text Analysis: Understanding nlp , install nltk , tokenize words , tokenizing sentences , stop word customization , stemming and lemmatization , Feature Extraction , Sentiment Analysis , Count Vectorizer, Tfidf Vectorizer.

UNIT-2

Image Processing: Install opencv module, Reading images , Understanding gray scaleimage , Resizing image , Understanding haar classifiers , Face and eyes Detection , Building image dataset , capturing video, Face classification in video.

UNIT-3

TIME SERIES:

Understanding Time Series Data , Visualizing and Understanding Time Series, Components, Autocovariance , ACF and PACF , Autoregressive models: AR,MA, ARMA, ARIMA , Exponential Smoothing , Holt-Winter's Model.

Unit-4

Recommendation System:

Content based technique, Collaborative filtering technique, Evaluating similarity based on correlation

Classification-based recommendations.

Unit-5

Data Visualization with Tableau :

Intro to Tableau Interface, Connnecting to Data, Visual Analytics, Mapping, Calculations, Dashboard and Stories.

Unit-6

Data Visualization with PowerBI:

Introduction to PowerBI, Visualisation with BI, Data Analysis Expressions

Course Outcomes:

1. Identify and explain fundamental mathematical and algorithmic ingredients that constitute a Recommendation Engine (dimensionality reduction, singular value decomposition, principal component analysis). Build their own recommendation system using existing components.
2. Create effective visualization of given data (to communicate or persuade).
3. Work effectively (and synergically) in teams on data science projects.

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: ELEMENTS OF STATISTICAL LEARNING

PAPER CODE: PG-DSA-202

Semester -2nd	Sessional – 25 Marks
Stream–Data Science & Analytics	Theory– 75 Marks
L T P Total Credits	Total: 100 Marks
4 0 0 4	Duration of Exam: 3 Hours

Course Objectives:

1. How to calculate and apply measures of location and measures of dispersion -- grouped and ungrouped data cases.
2. How to apply discrete and continuous probability distributions to various business problems.
3. Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases. Understand the concept of p-values.
4. Learn non-parametric test such as the Chi-Square test for Independence as well as Goodness of Fit.

Course Contents:

1. Introduction to Random Variable, Random Sample, Statistic and Parameter, Sampling Distributions , Expectation ,Variance ,Covariance, Correlation.
2. Common Probability Distribution , Marginal Probability , Conditional Probability ,
3. Chain Rule of Conditional Probability, Independence and Conditional Independence.
4. Theory of Estimation: Sufficient statistics, completeness, unbiased estimation, moment estimation, maximum likelihood estimation, notion of admissibility of estimators.
5. Testing of Statistical Hypothesis: Generalized NP lemma, Unbiased critical regions, unbiased tests and similar regions, invariant test, testing and confidence regions.
6. Model Building: Linear Regression(Least square methods and Gradient
7. Descent method) . Logistic Regression(logistic function , logits , odds ,odds ratio)
8. Bayesian Paradigm: Introduction, Bayesian and Minimax decision rules, selection of a prior, Bayesian point estimation, Bayesian sufficiency, and Classical approximation methods.

Course Outcomes:

1. Student can calculate and apply all measures of location and measures of dispersion for grouped and ungrouped data
2. Student can apply discrete and continuous probability distributions to all of business problems.
3. Student can perform all test of Hypothesis
4. Student can compute and interpret all of the results of Bivariate Regression

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: MACHINE LEARNING

PAPER CODE: PG-DSA-203

Semester -2nd	Sessional – 25 Marks
Stream–Data Science & Analytics	Theory– 75 Marks
L T P Total Credits	Total: 100
Marks	
4 0 0 4	Duration of Exam: 3 Hours

Course Objectives:

1. To introduce students to the basic concepts and techniques of Machine Learning.
2. To become familiar with regression methods, classification methods, clustering methods.
3. To become familiar with Dimensionality reduction Techniques.

Course Contents:

Unit-1

ML Fundamentals:

ML Modelling Flow, Parametric and Non-Parametric ML, Algorithm, Types of ML, Performance Measures, Bias-Variance Trade-Off, Overfitting and Underfitting, Optimization

Unit-2

Linear Regression:

Linear Regression with OLS, Linear Regression with SGD, Evaluating Model Parameters , L1 and L2 Regularization, Mesuring Performance Metrics

Unit-3:

Logistic Regression:

Logistic Regression MLE , Logistic Regression with SGD , Evaluating Model Performance, Measuring Performance Metrics: Precision, Recall, AUC ROC, etc

Unit-4

Decision Trees:

Intro to Decision Tree ,| Entropy and Information Gain , Standard Deviation Reduction, Gini Index , CART and CHAID , Performance Metrics

Unit-5

Random Forests:

Bootstrap Sampling , Bagging (Bootstrap Aggregation) , Intro to Random Forest , Why Random Forest ,Performance Metrics

Unit-6

Model Selection Technique:

Cross Validation , Types of Cross Validation , Hold-out , K-fold , Grid and random search for Parameter tuning.

Unit-7

Support Vector Machines (SVM):

Understanding Vectors, Decision Boundary , Support Vectors , Understanding Hyperplane , What is Support Vector Machine , Working of SVM , Kernels and Types of Kernels ,Strengths and Challenges of SVM

Unit-8

Ensemble Techniques:

Boosting , AdaBoost , Gradient Boosting , XGBoost

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Unit-9

Principal Component Analysis:

Intro to Dimensionality Reduction, Computing Components in PCA, Dimensionality Reduction using PCA

Unit-10

K-Means Clustering:

Intro to Clustering , What is K-Means Clustering? , K-Means Clustering Algorithm , Choosing the Optimum K value (Elbow Method) , Various Distance Measures**.**

Unit-11

Hierarchical clustering | Intro to Hierarchical Clustering | Dendrogram | Types of Hierarchical Clustering: Agglomerative and Divisive , Cluster Linkage

Course Outcomes:

1. Gain knowledge about basic concepts of Machine Learning
2. Identify machine learning techniques suitable for a given problem
3. Solve the problems using various machine learning techniques
4. Apply Dimensionality reduction techniques.

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: DEEP LEARNING

PAPER CODE: PG-DSA-204

Semester -2nd	Sessional – 25 Marks
Stream–Data Science & Analytics	Theory– 75 Marks
L T P Total Credits	Total: 100 Marks
4 0 0 4	Duration of Exam: 3 Hours

Course Objectives:

1. To introduce neural networks concepts and associated techniques
2. To design appropriate neural network based technique for a given scenario.
3. To reduce the dimension of an image and classification of images.
4. To introduce the recurrent neural networks to overcome sequence learning problems.

Course Contents:

MODULE-1: INTRODUCTION TO NEURAL NETWORKS

Artificial neurons, Neural networks and architectures, Activation function-linear and non-linear, Learning types-supervised, unsupervised and reinforced, McCulloch Pitts neuron model, Learning rules-Delta learning rule, Competitive learning rule, Hebbian learning rule and Perceptron learning rule, etc.

MODULE-2: CLASSIFIERS

Single Perceptron as classifier, Perceptron networks for linearly separable classification, Multi-layer perceptron model, Adaline, Madaline.

MODULE-3: DEEP NEURAL NETWORKS

Back Propagation Algorithms, Sequence learning problems, Introduction to Recurrent neural networks, Vanishing gradient problem, LSTM network, Basic structure of convolution neural networks.

MODULE-4: DIMENSION REDUCTION TECHNIQUES

Introduction to PCA, Dimensionality reduction Using PCA, Singular Value Decomposition.

Course Outcomes:

To provide an understanding of different types of Deep Architectures, including Convolutional Networks and Recurrent Networks.

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: MATHEMATICS

PAPER CODE: PG-DSA-205

Semester -2nd | Sessional – 25 Marks

Stream–Data Science & Analytics | Theory– 75 Marks

L T P Total Credits | Total: 100 Marks

4 0 0 4 | Duration of Exam: 3 Hours

Course Contents:

1. Scalars , Vectors , Matrix ,Tensors
2. Vector space ,Linearly independent and linearly dependent set of vectors, Basis and dimension of a vector space , Norm of Matrix
3. Linear Transformations and its matrix representation, Elementary transformations, Rank of a transformation, Rank- nullity theorem
4. Matrix decomposition, Quadratic forms, Geometry of positive definite quadratic form, Determinant, Partitioning of matrices
5. Eigen value, Eigen vector, Cayley-Hamilton theorem, Similarity of matrices, Diagonalization of matrices
6. Inner product spaces, Isometry, Orthonormal bases, Gram-Schmidt process.. Solution of the system of linear equations. Matrix differential operators, Jacobian of matrix transformation, and function of matrix arguments
7. Principal Component Analysis

Course Outcomes:

1. analyze the solution set of a system of linear equations.
2. express some algebraic concepts (such as binary operation, group, field).
3. express a system of linear equations in a matrix form.
4. definite a vector space and subspace of a vector space.
5. describe the concepts of eigenvalue, eigenvector and characteristc polynomial.

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: MACHINE LEARNING LAB

PAPER CODE: PCC-WD-206

Semester: 2nd | Internal – 30 Marks

Stream– Data Science & Analytics | External – 20 Marks

L T P Total Credits | Total - 50 Marks

0 0 3 3 | Duration of Exam: 3 Hours

1. Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.
2. For a given set of training data examples stored in a .CSV file, implement and demonstrate the Candidate-Elimination algorithm to output a description of the set of all hypotheses consistent with the training examples.
3. Write a program to demonstrate the working of the decision tree based ID3 algorithm. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.
4. Build an Artificial Neural Network by implementing the Back propagation algorithm and test the same using appropriate data sets.
5. Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets.
6. Assuming a set of documents that need to be classified, use the naïve Bayesian Classifier model to perform this task. Built-in Java classes/API can be used to write the program. Calculate the accuracy, precision, and recall for your data set.
7. Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set. You can use Java/Python ML library classes/API.
8. Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same data set for clustering using k-Means algorithm. Compare the results of these two algorithms and comment on the quality of clustering. You can add Java/Python ML library classes/API in the program.
9. Write a program to implement k-Nearest Neighbour algorithm to classify the iris data set. Print both correct and wrong predictions. Java/Python ML library classes can be used for this problem.
10. Implement the non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.

Course Outcomes:

Real World Problem solving and programming capability

J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

SUBJECT NAME: PYTHON LAB

PAPER CODE: PCC-WD-207

Semester: 2nd | Internal – 30 Marks

Stream– Data Science & Analytics | External – 20 Marks

L T P Total Credits | Total - 50 Marks

0 0 3 3 | Duration of Exam: 3 Hours

Course Objectives:

The course is designed to provide Basic knowledge of Python. Python programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language

Course Contents:

Unit-1

Python Module:

Introduction to module, Types of Module, import Statement, from…import Statement, Import * Statement, Underscores in Python, The dir( ) Function , Creating User defined Modules, Command line Arguments , Python Module Search Path

Unit-2

- **Packages in python:**

Introduction to Package, .py file, Importing module from a package, Creating a Package, Creating Sub Package, Importing from Sub-Packages, Popular Python Packages

Unit-3

Python predefined module

Date & DateTime Class, Format Time Output, Timedelta Objects, Calendar Module,os module.

Unit-4

- **File Handling:**

Introduction to file handling, File Objects , File Different Modes and Object Attributes, a Text File and Append Data to a File and Read a File, Closing a file, Read, read line , read lines,write,write lines, Renaming and Deleting Files.

Unit-5

Exception Handling:

importance Of Exception, Introduction to Exception Handling, Try … Except, Try .. Except .. else Try … finally, Argument of an Exception, Python Custom Exceptions, Ignore Errors, Assertions, Using Assertions Effectively.

Unit-6

Object Oriented Programming System:

Define oops concept, Difference between class variable and instance variable, Difference between function and method, Define class, What are object and instance of a class?, Name all features of oops, encapsulation , Polymorphism, Inheritance, Differentiate among instance method , class method , static method.

Unit-7

Regular Expression:

Introduction to regular expression, Regular Expression Syntax, Understanding Regular Expressions, Regular Expression Patterns, Literal characters, Repetition Cases, Example of w+ and ^ Expression, Example of \s expression in re.split function, Using regular expression methods, Using re.match(),Finding Pattern in Text (re.search()),re.findall for text, Flags, Methods of RE.

Unit-8

Database Connectivity:

Creating Database connection, Understanding cursor, Executing Queries, Parameterised Queries

Unit-9

Multithreading:

Intrduction to Multithreading, Threading Module, Define a thread, Thread Synchronization.

Unit-10

GUI Programming-tkinter:

Introduction, Components and events, Adding control, Label, Button, Entry, Text , Radio, Check widget, ListBox, Menu, Combobox

Course Outcomes:

Problem solving and programming capability.

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 PG Diploma in Data Science & Analytics (program Code: 271)
Revised Scheme Course Index of the year 2019-2020(BOS Dated 24/10/2019)
Mapping of the course with the employability/Entrepreneurship/Skill Development

S.NO	Course	Code	Skill development	Entrepreneurship	Employability
1	INTRODUCTION TO DATA SCIENCE & MACHINE LEARNING	PG-DSA-101	✓		✓
2	STATISTICS & PROBABILITY	PG-DSA- 102	✓	✓	
3	ADVANCED DATABASE MANAGEMENT SYSTEM	PG-DSA-103	✓		✓
4	DATA STRUCTURES & ALGORITHMS	PG-DSA-104	✓		✓
5	PYTHON LAB	PG-DSA-105	✓	✓	✓
6	R PROGRAMMINGLAB	PG-DSA-106	✓	✓	✓
7	SQL LAB	PG-DSA-107	✓	✓	✓
8	FUNDAMENTALSOF DATA SCIENCE	PG-DSA-201	✓		✓
9	ELEMENTS OF STATISTICAL LEARNING	PG-DSA-202	✓	✓	
10	MACHINE LEARNING	PG-DSA-203	✓		✓
11	DEEP LEARNING	PG-DSA-204	✓		✓
12	MATHEMATICS	PG-DSA-205	✓	✓	
13	MACHINE LEARNING LAB	PG-DSA-206	✓	✓	✓
14	PYTHON LAB	PG-DSA-207	✓	✓	✓
15	MINOR PROJECT	PG-DSA-208	✓	✓	

Principal CCSD