



RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

PROGRAMME NAME : INFORMATION TECHNOLOGY, COMPUTER SCIENCE &
ENGG., COMPUTER HARDWARE & MAINTENANCE

Name of Scheme: OCBC 19

SEMESTER: **SECOND**

SUBJECT: BASICS OF ELECTRICAL, ELECTRONICS & MEASUREMENT

PAPER CODE: 7152

1. COURSE OUTCOMES

COURSE OUTCOMES		Mapping with PO
CO204.1	Analyse DC circuits	PO1, PO4, PO5, PO6
CO204.2	Explain the concepts of A.C. circuits and electro-magnetism.	PO1, PO4, PO5, PO6
CO204.3	Explain the characteristics of P-N Junction diode and its basic circuits.	PO1, PO4, PO6
CO204.4	Describe working of transistor and regulated power supply	PO1, PO4, PO6
CO204.5	Explain construction and working principle of various measuring instruments.	PO1, PO4, PO6

2. CO-PO Mapping

Course Outcomes	Program Outcomes						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO204.1	1	-	-	1	1	1	-
CO204.2	1	-	-	1	1	1	-
CO204.3	1	-	-	1	-	1	-
CO204.4	1	-	-	1	-	1	-
CO204.5	1	-	-	1	-	1	-
CO204	1	-	-	1	1	1	-



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3. COURSE CONTENT

Unit	Topic	Contents	CO	Hrs.	Marks
1	Elementary Concepts and D.C. circuits	<p>Concept of current, voltage, resistance, conductance, resistivity and conductivity. Their units and effect of temperature, resistance temperature coefficient, Ohm's law, Power & Energy and its SI units.</p> <p>Kirchhoff's Laws & its applications in simple DC Circuits, Analysis of series, parallel circuits.</p> <p>Series & Parallel combination of resistance, capacitance, inductance and wattage.</p> <p>Consideration with Simple Problems.</p>	CO204.1	16	20
2	A.C. Circuit & Electro-magnetism	<p>Alternating voltage and currents, their mathematical and graphical representation, comparison between AC and DC.</p> <p>Concept of cycle period, frequency, instantaneous, peak, average, r.m.s. values, peak factor, and form factor, phase difference, lagging, leading and in phase quantities and phasor representation. A.C. through pure resistors, inductors and capacitors. RL & RLC series circuits. numerical problems.</p> <p>Magnetic effect of electrical current, Concepts of m.m.f, flux, flux density, reluctance, permeability and field strength, their units and relationship, Comparison of electrical & magnetic circuits.</p> <p>Faraday's Laws of electromagnetic induction, statically and dynamically induced emf's, self and mutual inductance, coefficient of coupling, simple numerical problems.</p>	CO204.2	20	20
3	Semiconductor Physic & Diode:	<p>Fundamentals of semiconductor – Energy bands (conduction & valence), Effect of temperature on conductivity, Intrinsic & Extrinsic semiconductor, Doping, P-type and N-type semiconductor, Concept of majority and minority carriers.</p>	CO204.3	20	20



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		<p>Concept of P-N junction, Diffusion & Drift, Barrier potential, Depletion region. Biasing (forward and reverse) and characteristic of P-N junction diode with specification, Zener diode and its V-I Characteristics, Breakdown mechanism.</p> <p>Diode as half wave and full wave rectifiers (Centre tapped and bridge type), Circuit operation of the rectifiers, Input & output waveforms for voltage & current, Average value of voltage & current, Ripple, Ripple factor, Ripple frequency, Form factor, PIV of diode used, Rectifier efficiency.</p> <p>Need of filters, Types of filter – Series inductor, Shunt capacitor, LC filter, π filter. Operation of the filters, its limitations & advantages.</p>			
4	Transistors & Regulated Power Supply	<p>Construction of NPN & PNP types transistor, Symbols, Packaging, Working principle of NPN and PNP transistor – current flow, relation between different currents.</p> <p>Transistor configurations – CB, CE, CC, circuit diagram and input & output characteristics for each configuration, Comparison between three configurations. General introduction of UJT, FET and SCR</p> <p>Need of regulation, voltage regulation factor, Concept of load regulation & line regulation, Block diagram of regulated power supply.</p> <p>Zener diode voltage regulator and its limitation, Transistorised regulated power supply (Shunt and series) – circuit diagram and operation. Regulator IC's- IC78xx, IC79xx, IC723, SMPS – Meaning, working, block diagram, advantages, ratings.</p>	CO204.4	20	20
5	Measurement Fundamentals & Instruments	<p>Accuracy, Precision, Sensitivity, Resolution, Dynamic range, Response and Repeatability of measuring instruments, Definition of Errors and type of errors.</p> <p>Working principle and construction of Ammeter and Voltmeter, Comparison between them, Extension of range and simple numerical problems.</p> <p>Working principle and construction of Wattmeter (dynamometer type) and Energy meter (static type), Digital Multi Meter, Advantages of DMM over Conventional Multi Meter.</p>	CO204.5	14	20



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		Block diagram of CRO, constructional features of CRT and principle of operation			
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4. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN:

Unit No.	Unit Title	Teaching Hours	Tentative Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Elementary Concepts and D.C. circuits	16	10	6	4	20
2	A.C. Circuit & Electro-magnetism	20	10	6	4	20
3	Semiconductor Physic & Diode	20	12	8	-	20
4	Transistors & Regulated Power Supply	20	12	8	-	20
5	Measurement Fundamentals & Instruments	14	10	6	4	20
Total		90				100

Legends: R=Remember, U=Understand, A=Apply and above (Bloom's Revised taxonomy)

5. SUGGESTED LIST OF EXPERIMENT

S.N.	Experiment	CO
1.	To verify ohm's law.	CO204.1
2.	To verify Kirchhoff's law.	CO204.1
3.	To measure voltage, current & power in single-phase circuit. (with resistive load).	CO204.1



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4.	Study AC circuit with resistor, inductor and capacitor at constant frequency	CO204.2
5.	To plot the V-I characteristics of P-N junction diode	CO204.3
6.	To construct half-wave & full-wave rectifier circuit & draw input, output waveforms.	CO204.3
7.	To Plot the V-I characteristics of Zener diode.	CO204.3
8.	To study the Zener diode as voltage regulator & calculate load regulation.	CO204.4
9.	To plot the input & output characteristics of a BJT in CE or CB mode	CO204.4
10.	To construct a power supply on bread board, observe and measure the waveform on CRO.	CO204.4
11.	Study of regulator ICs- 78XX & 79XX.	CO204.4
12.	To study the operation and to use- (a) Multimeter (b) Oscilloscope (c) AC/DC Voltmeter (d) AC/DC Ammeter (e) AC/DC Wattmeter	CO204.5

6. REFERENCE BOOKS:

S.N.	Title	Author
1	Electronic Technology	E.admirality
2	Electrical Engineering basic technology	Hubscher, Klauepfloger, Appelt, Willey Eastern Ltd, New Delhi
3	Electrical Engineering	J.B. Gupta
4	Experiments in basic electrical Engineering	S.K. Bhattacharya, S.K. Rastogi, K.M., New Age International , New Delhi
5	Problems in Electrical Engineering	Smith P., 1st ,1996,
6	A Text book of Applied Electronics	R.S. Sedha, S. Chand & Co. New Delh
7	Principals of Electronics	Latest , V.K.Mehta , S.Chand Publication



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8	Electronics Principles	Malvino TMH
9	Electrical Technology	B.L. Thereja , Chand Rai

7. TENTATIVE LIST OF LABORATORY EQUIPMENT

S.No. Name of Item

1. Ammeter (Moving Iron and Moving Coil)
2. Voltmeter
3. Multimeter (Analogue)
4. Multimeter (digital)
5. CRO
6. Wattmeter
7. Energymeter (static)
8. Power supply

COMPONENTS

1. Diodes
2. Transistors
3. Resistors
4. Inductor
5. Capacitor
6. Regulator ICs
7. Connecting wires



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SEMESTER: **SECOND**

SUBJECT: **DIGITAL TECHNIQUES**

PAPER CODE : **7151**

SCHEME OF STUDIES

S.No.	Topics	SCHEME OF STUDIES		
		HOURS OF STUDY		
		Theory	Practical	Total
1	Fundamental concepts of digital techniques	16		
2	Logic Gates and Boolean Algebra	18		
3	Combinational Logic circuit	10		
4	Logic Families	10		
5	Sequential Logic Circuit	10		
	Total	64		



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Course Outcomes

Student will be able to:-

C204.1	Perform conversion among different number systems, and became familiar with basic codes used in digital computer.
C204.2	Design simple Logic Circuit with logic gates by applying Boolean laws and rules on expression.
C204.3	Learn the minimization techniques to simplify the hardware requirements of digital circuit and understand the design of Combinational circuit.
C204.4	Obtain basic knowledge of logic families for implement logics within integrated circuit.
C204.5	Understand the design of Sequential Circuits such as Flip Flop, Registers and Counters.

Mapping CO's with PO's and PSO's

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
C204.1	3	3	1	2	-	2	2	3	1	1
C204.2	3	3	1	2	-	2	2	3	1	1
C204.3	3	2	2	1	-	2	2	2	1	1
C204.4	3	1	2	2	-	2	1	2	2	1
C204.5	3	2	2	2	-	2	2	2	1	1
C204	3	2	2	2	-	2	2	2	1	1



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Course Content

Unit	Course Contents	Hours
Unit1: Fundamental Concepts of digital system	1.1- Definition of Signal, Comparisons Between Analog and digital signal. 1.2-Advantages and disadvantages of Digital Circuits. 1.3-Number System-Introduction to binary ,octal, decimal and hexadecimal number systems 1.4-Conversion between number system. 1.5-Binary Arithmetic-Binary addition, subtraction, Multiplication and division. 1.6-1's and 2's complements and its utilization 1.7-Codes-BCD, Grey Code, Excess 3, EBCDIC, ASCII Code and its uses..	16
Unit 2: Logic Gates And Boolean Algebra	2.1 -Logic Gates: Basic concepts of Diode/transistor switch circuit, Logic Gates Symbols, Truth Table and Logical expression of Basic logic gates-AND,OR,NOT Universal Gates-NAND and NOR Special Purpose Gates-EX-OR,EX-NOR 2.2-Realization Of All Other Gates Using Universal Gates 2.3-Boolean Algebra-Rules and Laws Of Boolean Algebra,DeMorgan's Theorem. Duality Theorem 2.4-Introduction to logic design with Karnaugh map 2.5 –Simplification of Boolean Function upto 4 variable(2,3,4 variable),Don't Care Condition 2.6-Boolean Representation-Sum of Product and product of Sum, Min Term and Max term	18



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Unit 3: Combinational Logic Circuits	3.1-Half adder,Full adder 3.2-Half Subtractor and Full Subtractor 3.3-Basics of Encoder ,Decimal to BCD Encoder 3.4-Basics of Decoder,BCD -to -Seven Segments Decoder. 3.5-Multiplexer/Demultiplexer-Applications Of Multiplexer and Demultiplexer ,4:1 Multiplexer,1:4 Demultiplexer 3.6- Code Covertor-BCD to Binary(74184) ,Binary to BCD(74185A)	10
Unit 4: Logic Families	3.1- Introduction to Digital Integrated Circuits 3.2- Characteristics of Digital IC's 3.3 -Characteristics of Logic Families –Power Dissipation,Speed,Fan in Fan Out, Propagation delay Time 3.4 -logic Families –RTL,DTL,IIL,ECL,MOS 3.5- Analysis of open collector and tri –state Logic	10
Unit 5: Sequential Logic Circuits	5.1-One bit Memory Cell, Concept of clock Signal 5.2-Flip Flop –S-R,Clocked R-S.JK,JK Master Slave,T and D Flip Flop,Application of Flip Flop 5.3-Registers ,Shift Register ,types of Shift Register-SISO,SIPO,PISO,PIPO 5.4-Counters-Basics of counter and its applications	10



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SUGGESTED LIST OF EXPERIMENTS

S.No	Experiment list
1	Study and Verify the truth table of logic gates (74xx series).
2	Realization of AND, OR, NOT and Ex-OR logic gates using NAND and NOR gate
3	Verification of Demorgan's theorem
4	Implementation of full adder, subtractor using gates
5	Study of gray to binary code convertor using gates
6	Study to multiplexer and demultiplexers
7	Study of BCD adder
8	Verification of truth table of flip flop using IC's
9	Shift registers using D flip-flop
10	Ripple counter using J-K flip-flop
11	Synchronous counter using J-K flip-flops



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Unit no	Unit Title	Teaching Hour	Distribution of theory marks			
			R level	U level	A Level	Total Marks
1	Fundamental concepts of digital techniques	16				20
2	Logic Gates and Boolean Algebra	18				20
3	Logic Families	10				20
4	Combinational Logic circuit	10				20
5	Sequential Logic Circuit	10				20
Total		64				



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OUTCOME BASED CURRICULUM

PROGRAMME NAME : INFORMATION TECHNOLOGY, COMPUTER SCIENCE & ENGG., COMPUTER
HARDWARE & MAINTENANCE

Name of Scheme: OCBC 19

SEMESTER: **SECOND**

COURSE TITLE : ELECTRONIC WORKSHOP

1. COURSE OUTCOMES

COURSE OUTCOMES		Mapping with PO
CO205.1	Identify and utilize the various types of tools, accessories and electronics components.	PO1, PO4, PO5, PO6
CO205.2	Compare different types of cables, connectors and displays.	PO1, PO4, PO5, PO6
CO205.3	Explain the need of protective devices in a circuit.	PO1, PO4, PO5, PO6
CO205.4	Measure various parameter of signal using appropriate measuring instruments.	PO1, PO4, PO5, PO6
CO205.5	Prepare network cable and circuit on PCB.	PO1, PO2, PO3, PO4, PO5, PO6

2. CO-PO Mapping

Course Outcomes	Program Outcomes						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO205.1	1	-	-	2	1	2	-
CO205.2	1	-	-	2	1	2	-
CO205.3	1	-	-	2	1	2	-
CO205.4	1	-	-	2	1	2	-
CO205.5	1	1	1	2	1	2	-
CO205	1	1	1	2	1	2	-



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SEMESTER: **SECOND**

COURSE TITLE : ELECTRONIC WORKSHOP

3. COURSE CONTENT

Unit	Topic	Contents	CO	Hrs.
1	Basic Electronics Tools, Accessories and Components	<p>SMT & SMD: Soldering and Desoldering technique, Different types of Cutters, Nose pliers, Wire strippers, Screw drivers, Lead straighteners, Extractors, Soldering Iron, Desoldering Pump, Crimping tool. Breadboard wiring, general purpose PCB soldering/wiring.</p> <p>Resistors: Classification of resistors, Materials used for resistors, Maximum power rating, tolerance, temperature coefficient, Carbon film resistors, Standard wire wound resistors, Colour Coding, LDR.</p> <p>Capacitors: Materials used for capacitors, Working voltage, Capacitive reactance. Coding of capacitors. Types of Capacitor: Fixed Capacitor types (Disc, Ceramic capacitor, Aluminium electrolytic capacitor), Variable capacitor types (Air Gang, PVC gang capacitor, Trimmer mica capacitor).</p> <p>Inductors: Air core, iron core, ferrite core inductor, frequency range Inductors: - A.F., R.F., I.F., Toroidal Inductor.</p> <p>ICs: Monolithic IC, thick & thin film IC, Hybrid IC, Linear IC, Digital IC, IC packages- SIP, TO5, Flat, DIP, Pin Identification. Identification of components i.e. Diodes, Transistors, FET, UJT, SCR, Transformers.</p>	CO205.1	12
2	Cables, Connectors and Display Devices	<p>Cables: Co-axial cable, Twisted pair cable, Flat ribbon cable, Fibre optic cable.</p> <p>Connectors: BNC, D series, Audio, Video, printer, edge, FRC, RJ 45 connectors, Phone Plug & Jacks and their application.</p> <p>LED display, Seven segment display, LCD display.</p>	CO205.2	12
3	Switches and Protective Devices	<p>Switches: Toggle switches-SPST, SPDT, DPST, DPDT, Thumb-wheel switches- BCD, Decimal, Rotary switches, Push on/Push off switches, Keyboard switches-mechanical,</p>	CO205.3	12



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		<p>Capacitive, membrane, DIP switches, Membrane switch.</p> <p>Fuses: Glass, fuse, Resettable fuse, Shunt fuse- MOV, HRC fuse.</p> <p>Relay: Working, construction and application of General purpose relay, NO, NC contact, Difference between switch & relay.</p> <p>MCB: Working principle, construction and applications.</p>		
4	Measuring instruments	<p>Analog & Digital multimeter: Study and use analog & digital multimeter to measure- AC and DC voltage, AC and DC current, Different resistor, Continuity testing.</p> <p>Function generator: Front panel controls and its function as frequency changer and amplifier.</p> <p>CRO: Front panel controls and its function – To measure of AC-DC voltage and resistance, To measure of time and frequency of AC voltage, To measure of voltage, time and frequency of different types of wave, Testing of various component- resistor, capacitor, inductor, transformer and diodes.</p> <p>DSO, Dual power supply and LCR meter.</p>	CO205.4	12
5	Preparing cables and boards	<p>Prepare computer network cable using different type of cable and connectors.</p> <p>Study and use bread boards to implement simple electronic circuits using resistors / capacitors / diodes / transistors / switches / display devices.</p> <p>Prepare two simple electronic circuits using general purpose zero PCBs.</p> <p>Prepare two PCBs for simple electronic circuits.</p>	CO205.5	12

4. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN:

Unit No.	Unit Title	Teaching Hours	Tentative Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks



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COURSE TITLE : ELECTRONIC WORKSHOP

1	Basic Electronics Tools, Accessories and Components	12	-	-	-	-
2	Cables, Connectors and Display Devices	12	-	-	-	-
3	Switches and Protective Devices	12	-	-	-	-
4	Measuring instruments	12	-	-	-	-
5	Preparing cables and boards	12	-	-	-	-
Total		60				

Legends: R=Remember, U=Understand, A=Apply and above (Bloom's Revised taxonomy)

5. SUGGESTED LIST OF EXPERIMENT

S.N.	Experiment	CO
1.	Identify the various types of resistors and find out the values from color bands /written values on them and measure with multimeter.	CO205.1 & CO205.4
2.	Identify the (i) Terminals of a diode and its polarity, (ii) Zener, LED, Photodiode, IR diode (iii) Terminals of a Transistor and its Type (n-p-n or p-n-p).	CO205.1
3.	Identify and use different tools and accessories used in manufacturing of electronic circuits. <ul style="list-style-type: none">• Different types of cutters.• Nose pliers• Wire strippers• Screw drivers• Lead strengtheners• Extractors• Soldering iron• Desoldering pump• Crimping tool	CO205.1
4.	Identify the type of components(L,C,R) and find out the values using LCR-Meter	CO205.1 & CO205.4
5.	Identify the various waveforms of Function Generator using CRO. Measure	CO205.4



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	Amplitude & Frequency for various waveforms using CRO.	
6.	Use regulated power supply and identify front panel controls and their functions.	CO205.4
7.	Use DC and AC voltmeter and ammeter to measure DC and AC voltage current.	CO205.4
8.	Use analog multi-meter to measure. <ul style="list-style-type: none">• AC and DC voltage• AC and DC current• Resistance of Different resistors• Continuity testing.	CO205.4
9.	Use digital multi meter to measure: <ul style="list-style-type: none">• AC and DC voltage• AC and DC current• Different resistor• Continuity testing.	CO205.4
10.	Identify various kinds of electronic components	CO205.1
11.	Use different switches <ul style="list-style-type: none">• Toggle switches – SPST, SPDT, DPST, DPDT• Thumb-wheel switches• Rotary switches• Push on/Push off switches• Keyboard switches – mechanical, capacitive, membrane• DIP switches	CO205.3
12.	Use of different display devices <ul style="list-style-type: none">• LED display• Seven segment display• LCD display	CO205.2
13.	Solder the joint connection of wires and components on a PCB and check it. De-solder it and Re-solder	CO205.1 & CO205.5
14.	Prepare computer network cable (use different type of cable and connectors)	CO205.2 & CO205.5
15.	Use of breadboards to implement simple electronic circuits using resistors/capacitors/diodes/transistors/switches/display devices.	CO205.1 & CO205.5
16.	Prepare two simple electronic circuits using general purpose PCBs.	CO205.5
17.	Prepare two PCBs for simple electronic circuits.	CO205.5
18.	Assemble circuit on breadboards and PCBs (e.g rectifiers, oscillators, amplifiers).	CO205.5

6. REFERENCE BOOKS:



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COURSE TITLE : ELECTRONIC WORKSHOP

S.N.	Title	Author
1	Electronic Component and Materials	S.M. Dhir, Tata McGraw Hills publishing company Ltd., New Delhi
2	Printed circuit boards design and technology	W.C. Bosshart, Tata McGraw Hills publishing company Ltd., New Delhi
3	Electronics Project for Biginners	A.K. Maini, Pustak Mahal, DariyaGanj, Delhi

7. TENTATIVE LIST OF LABORATORY EQUIPMENT:

S.No. Name of Equipment

1. Digital LCR Meter
2. Electronic Energy Meter
3. Analog Multimeter
4. Digital Multimeter
5. D.C. Ammeters
6. D.C. Voltmeter
7. A.C. Ammeter
8. A.C. Voltmeter
9. CRO
10. Function Generator
11. Coil Winding Machine (Motorised)
12. Coil Winding Machine (Hand Operated)
13. Bench Drilling Machine
14. Portable Drilling Machine
15. Screw Driver Set
16. Different types of Pliers
17. Various tools (wire cutter, wire stripper, wire lead bender, various pliers, screw drivers tongs & tweezers, IC extractor)
18. Soldering Gun Set
19. Screw Extractor Set
20. Soldering Iron
21. Desoldering pump
22. Soldering station
23. Dual-In-Line IC Extraction System
24. Different types of Cables
25. Different types of Connectors
26. Breadboards
27. Printed Circuit Board
28. Different types of discrete electronic components
29. Different types of Integrated Circuits



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HARDWARE & MAINTENANCE

Name of Scheme: OCBC 19

SEMESTER: **SECOND**

COURSE TITLE : ELECTRONIC WORKSHOP

30. Different types of switches
31. Different types of relays
32. Different types of MCB
33. Different types of Display devices
34. Furniture



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NAME OF THE PROGRAMME: COMMON TO ALL BRANCHES

Name of Scheme :OCBC -19

COURSE CODE : 6806

COURSE TITLE : ENVIRONMENTAL ENGG AND SAFETY

SEMESTER-I

COURSE OUTCOMES (COs)

- C102.1 Explore the components of biosphere and impact of human activity on environment.
- C102.2 Summarize the causes and sources of pollutants, and their impact on global environment.
- C102.3 Develop ethics and scientific awareness about waste generation and treatment.
- C102.4 Identify sources and types of wastes and its management.
- C102.5 Understand noise , noise pollution and control.

CO-PO MAPPING

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
C102.1	3	1	1	1	3	2	3
C102.2	3	2	2	2	3	1	3
C102.3	2	2	1	1	2	1	2
C102.4	2	2	1	2	2	1	2
C102.5	1	1	1	2	2	1	2

CONTENTS

Unit	topic	contents	
1	Introduction to environment	Definition, scope and importance of environmental studies. Ecosystem, types, structure and function of ecosystem. Energy flow in ecosystem. Biodiversity and its importance, threats to biodiversity and conservation of biodiversity. Natural resources and associated problems. Renewable and non renewable resources, forest resources- Description, benefits, Effects due to deforestation, Water resources –Use and conservation. Mineral resources–mining activity. Role and responsibility of engineer in environmental protection, health and safety. Fire hazards, prevention and precautions. Industrial hazards prevention and protection. Protection from air and noise pollution. Environment protection act Wild life protection act. Forest conservation act. Population growth aspects and importance and effects on environment. Human health and Human rights. Concept of carbon credits	



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SEMESTER-I

2	Air Pollution	<p>Standard definition of air pollution ,Composition of natural air, Names of air pollutants, Classification of air pollutants, primary and secondary pollutants, Classification of source of air pollutants on different bases, Definition of different types of aerosols. Effect of air pollution on: human health, material properties, vegetation. Major toxic metals and their effects., Air (prevention and control of pollution)act.</p> <p>Major environmental phenomenon e.g., acid rain, global warming, green house effect, ozone layer depletion. Air quality standards, Brief description of air pollution laws. Meteorological parameters influencing air pollution Environmental lapse rate, temperature inversion. Role of national green tribunal in India, Function of Regulatory boards like CPCB and State Pollution Control Boards</p>	
3	WATER POLLUTION and WASTE WATER TREATMENT METHOD	<p>Water resources, Classification of water, Origin, composition and characteristics of domestic waste water as well as industrial waste water, Biochemical oxygen demand, Water pollution laws and standards. Water conservation ,watershed management, Rain water harvesting : Definition, methods and benefits. Water (prevention and control of pollution)act, Waste water, Classification of waste water, Chemical oxygen demand. basic processes of water treatment. Meaning of primary, secondary and tertiary treatment. Flow chart of a simple effluent treatment plant, Theory of industrial waste treatment, Volume reduction, neutralization and precipitation methods.</p>	
4	Energy Environment Climate Change	<p>An overview of Bureau of Energy Efficiency (bee), The National Action Plan on Climate Change (NAPCC), Schemes under The National Mission for Enhanced Energy Efficiency (NMEEE), Energy Conservation Building Code (ECBC), Bio diversity and its conservation, Sustainable development, Kyoto Protocol, Conference of Parties (CoP), Clean Development Mechanism (CDM).</p>	



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SEMESTER-I

5	SOLID WASTE MANAGEMENT & NOISE POLLUTION	Sources and classification of solid waste, Public health aspects, Disposal methods – open dumping , sanitary , land fill, Incineration , composting, Potential methods of disposal ,Recovery and recycling of paper, glass, metal and plastic Sources of noise pollution ,Units of Noise pollution measurement, Allowable limits for different areas, Problems of noise pollution and measures to control it, Noise pollution control devices brief discussion	
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LIST OF EXPERIMENTS

S.NO.	NAME OF THE EXPERIMENTS	HRS OF PRACTICAL
	<p>NOISE POLLUTION</p> <p>1 Determination of sound pollution in (a) Auditorium (b) Factories (c) Busy roads (d) Theatre (e) TV rooms (select any three situations)</p> <p>INDUSTRIAL WASTE WATER</p> <p>(Any Two experiment may be selected from this group)</p> <p>2 Determination of pH and alkalinity/ acidity in industrial waste water.</p> <p>3 Determination of solids in industrial waste water.</p> <p>4 Determination of turbidity, colour and temperature of industrial waste water.</p> <p>5 Determine the dissolved oxygen by DO Meter.</p> <p>POLLUTION STANDARDS</p> <p>6 Study of drinking water standards.</p> <p>7 Study of effluent standards for water disposal.</p> <p>8 Study of air pollution standards.</p>	30



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SEMESTER-I

LIST OF ASSIGNMENTS

1. Study of a simple ecosystem like pond, rivers, hill slopes etc
2. Visit a local area and document the environmental assets like rivers, forest, hills, grasslands etc.
3. Prepare a list of plastic articles used daily in our life. Estimate the amount of raw materials used and how does where does come from? What are the disposal methods and predict the impact on environment
4. Estimate water is needed for a person daily and estimate for your town and find the sources that cater the supply and how can we regulate the excess usage of water by changing our habits
5. List out the article that are renewable and non renewable and their impact on environment
6. List out energy sources that we use daily. How can we decrease their use and dependence on them
7. Write an essay on how carbon credit is helping in minimising the pollution
8. Write a note on rain water harvesting
9. Carbon credits and sustainable development
10. Compare the use of renewable and non renewable sources of energy
11. List out some novel methods t reduce solid waste
12. List out the advantages of biodiversity.

SUGGESTED SPECIFICATION FOR QUESTION PAPER DESIGN

UNIT NO	TITLE	TEACHING HRS	TENTATIVE DISTRIBUTION OF MARKS			
			R LEVEL	U LEVEL	A LEVEL	TOTAL
1	INTRODUCTION TO ENVIRONMENT	18	04	08	02	14
2	AIR POLLUTION	18	02	08	04	14
3	WATER POLLUTION and WASTE WATER TREATMENT METHOD	18	04	06	04	14
4	ENERGY ENVIRONMENT CLIMATE CHANGE	18	04	06	04	14
5	SOLID WASTE MANAGEMENT& NOISE POLLUTION	18	04	04	06	14



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SEMESTER-I

REFERENCES

1. Environmental pollution control Engineering by C.S. Rao
2. Air pollution and control by Seth
3. Air pollution by M.N Rao
4. Industrial waste and its treatment by Seth
5. Paryavaran Yantriki Hindi granth akadami
6. Sites to visit: Bureau of Energy Efficiency, Ministry of New and Renewable Energy Sources
7. पर्यावरण अभियांत्रिकी एवं सुरक्षा – डा० शर्मिला जैन, संजय पब्लिकेशन जयपुर ।



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Name of Scheme: OCBC 19

SEMESTER: **SECOND**

SUBJECT: PROGRAMMING IN C

PAPER CODE: 7150

COURSE OUTCOMES

Course Outcomes		Mapping with POs
CO201.1	Describe the basic terminology used in C programming.	PO1,PO2,PO3,PO6,PO7
CO201.2	Use conditional and unconditional control statements in problem solving.	PO1,PO2,PO3,PO5,PO6,PO7
CO201.3	Use iterative statements in problem solving.	PO1,PO2,PO3,PO5,PO6,PO7
CO201.4	Apply concepts of arrays and strings in problem solving.	PO1,PO2,PO3,PO4,PO5,PO6,PO7
CO201.5	Convert complex program into simpler one using functions.	PO1,PO2,PO3,PO4,PO5,PO6,PO7

CO PO MAPPING

Course Outcomes	Program Outcomes						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO201.1	2	2	1	-	-	1	1
CO201.2	1	1	2	-	1	1	1
CO201.3	1	1	2	-	1	1	1
CO201.4	1	1	2	1	1	1	1
CO201.5	2	2	2	2	2	2	2
CO201	2	2	2	2	2	2	2



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SEMESTER: **SECOND**

SUBJECT: PROGRAMMING IN C

PAPER CODE: 7150

COURSE CONTENTS

Unit	Topic	Contents	CO	Hrs
I	Introduction to Programing	Algorithms, Flowcharts, structured programming Concepts, 'C' Programme structure, Pre-processor directives. Identifiers, keywords, variables, Constants, C data types : int, float, double, char. Qualifiers - long, short, unsigned and signed data type, Escape sequences ((like \n, \b etc.), Comments. Operators and Expressions : Arithmetic, Relational, Logical, Assignment operators, unary & ternary operators, hierarchy of operators. Input and Output functions : printf(), scanf(), getchar(), putchar(), getch(), putch()	CO201.1	12
II	Decision Control Statements	Conditional branching statements: if statement, if- else, nested if, use of logical operators and Compound Relational Tests Unconditional branching statements: goto statement, Multiple branching statements: switch case statement.	CO201.2	10
III	Loop Control Statements	Loop Statements: syntax and use of 'for' statement, 'while' statement, 'Do-while' statement, 'break-continue' statement, nested looping.	CO201.3	12
IV	Arrays and Strings	Arrays : types, declaration and initialization of one dimensional and two dimensional array, accessing array elements. String : Declaration and initialization of string variables, string handling functions from standard library - strlen(), strcpy(), strcat(), strcmp() etc. gets() and puts() functions.	CO201.4	14
V	Functions	Functions : need of functions, prototype declaration, defining function, passing parameters. Function calling mechanics - call by value and call by reference. Scope of variables. Storage classes - static auto, extern, register Recursion and its types Overview of library functions.	CO201.5	12



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SUGGESTED LIST OF EXPERIMENTS/TUTORIALS :

SNo	Name of Experiment	CO
1	Setting up environment/ IDE to create, edit, compile and run C programs.	1
2	Program to read input from keyboard of various data types and print them.	1
3	Program to print sum and average of two numbers.	1
4	Program to print area of geometrical shapes - triangle, rectangle, circle, etc.	1
5	Program to swap two numbers.	1
6	Program to find <ul style="list-style-type: none">• Maximum of two numbers.• A given number is even or odd.	2
7	Program using switch case <ul style="list-style-type: none">• Print week days.• Design calculator using arithmetic operators.	2
8	Program to print sum of first n natural numbers.	3
9	Program to find the factorial of a positive integer.	3
10	Program to print all odd numbers in between 1 to 50 using loop.	3
11	Program to print all alphabet from a to z using loop.	3
12	Program to print following pattern- **** *** ** *	3
13	Program to print following pattern- 1 1 2 1 2 3 1 2 3 4	3



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14	Program to store 10 integers in array and display them.	4
15	Program to find maximum number in an array.	4
16	Program to add two 2-D matrices.	4
17	Program to reverse a string.	4
18	Program to copy one string to another.	4
19	Program to find sum of two numbers using function.	5
20	Program to print prime no between 1 to 100 using functions.	5