### P.D.E.A's. Prof. Ramkrishna More College, Akurdi, Pune411044

## Syllabus Framework and Design of Electronics for

## B. Sc. (Comp. Sci.) and B.C.A. (Sci.) under Autonomy and NEP-2023

Sem.	Major Elective Courses	Minor Courses	VSC	GE/OE
		First Year Certific	ate Course	
Ι		-	To B.Sc. (Comp. Sci.) 1 Theory From Electronics	2 Theory From Electronics in Basket
п		1 Theory From Electronics		2 Theory From Electronics In Basket
		Second Year Grad	uate Diploma	
III		1 Theory + 1 Practical From Electronics		1 Practical From Electronics In Basket
IV		1 Theory + 1 Practical From Electronics	-	1 Practical From Electronics In Basket
		Third Year Gradu	ate Degree	
v	To B.Sc. (Comp. Sci.) 1 Theory + 1 Practical From Electronics	1 Theory + 1 Practical From Electronics		-
VII	To B.Sc. (Comp. Sci.) 1 Theory + 1 Practical From Electronics	1 Theory + 1 Practical From Electronics	-	-

### **Course Codes for various courses**

Sem.	Major Elective Courses	Minor Courses	VSC	GE/OE
	ŀ	First Year Certificate C	ourse	
Ι	-	-	CSVST-111	ELCOET-111 ELCOET-112
Π	-	ELCMIT-121	-	ELCOET-121 ELCOET-122
	Secor	nd Year Graduate I	Diploma	
III	-	ELCMIT-231 ELCMIP-232	-	ELCOEP-231
IV	-	ELCMIT-241 ELCMIP-242	-	ELCOEP-241
	Thi	ird Year Graduate	Degree	
V	CSMAET-351 CSMAEP-352	ELCMIT-351 ELCMIP-352	-	-
VII	CSMAET-361 CSMAEP-362	ELCMIT-361 ELCMIP-362	-	-

### P.D.E.A's. Prof. Ramkrishna More College, Akurdi, Pune-411044 Syllabus Framework and Design of Electronics for B. Sc. (Comp. Sci.) and B.C.A. (Sci.) under Autonomy and NEP-2023 Courses Codes, Generic name and Title of the paper of Electronics

Co	Courses from Electronics Department to GE/OE Basket for non-B.Sc. (Comp. Sci.) and B.C.A. (Science) students			. Sci.) and B.C.A.
I	ELCOET-111	Open Elective Theory from Electronics Science	Electronics for Everyone	2
	ELCOET-112	Open Elective Theory from Electronics Science	Electronic Instruments	2
II	ELCOET-121	Open Elective Theory from Electronics Science	Basics of Electronics	2
	ELCOET-122	Open Elective Theory from Electronics Science	Home appliances and E-Waste Management	2
III	ELCOEP-122	Open Elective Practical from Electronics Science	Electronics Practical Lab 5	2
IV	ELCOEP-122	Open Elective Practical from Electronics Science	Electronics Practical Lab 6	2

# Syllabus of Courses Offered by Electronics Department for GE/OE Basket

	F. Y. B.Sc. Semester I	
Electronics for everyone		
	Course code: ELCOET- 111No. of Credits: 2	
Unit	Contents	
	Introduction Electronics components and devices (20) Components: Overview and function of components, classification of electronic components. Resistors: Symbol, colour code, types Fixed and variable, carbon composition, metal film, wire wound variable resistor, potentiometers, presets, logarithmic, linear, multi-turn potentiometers, special purpose thermistor, VVR, LDR, - technical specifications (value, Wattage, Temperature coefficients)	
I	<ul> <li>Capacitors: General information, symbol, colour code, types such as air, paper, electrolytic, mica, tantalum, polystyrene, fixed and variable capacitors, specifications of capacitors. Power factor, working voltage, measurement of capacitance.</li> <li>Inductors and Transformers: Principle of operation, symbol, types of inductors: air core, iron core, ferrite core, AC mains choke, frequency response of inductor, Principle of operation of transformers, Types: single phase/three phase, auto-transformer and isolation transformers, Audio, IF and RF.</li> <li>Batteries: Dry cells, Lead acid accumulators, Nickel Cadmium cells, standard cells, principle, specifications, lifetime, calculation of time and ratings</li> </ul>	
	<b>Fuses, Relays, and Switches:</b> Fast and slow blow fuses, Pilot lamps, Relays- symbol, types and specifications, reed, and electromagnetic relays, SPDT, DPDT, band switches, touch switches, thumb wheel switches, micro-switches, specifications, application areas	
	<b>Miscellaneous Components:</b> Circuit Boards: Strip board, tag board, PCB, Breadboard, General Purpose PCB, Jumpers, SMD and SMT	
	Microphones: symbol, types, variable resistance (carbon), variable capacitance (condenser), variable inductance (moving coil), Loudspeakers: symbol, types, and specifications (frequency response, impedance, power rating, size, directionality) of midrange-speaker, tweeter, woofer	
	Tools in Electronics Laboratories: (10)	
п	Wire stripping pliers, Adjustable stripping plier, Needle nose plier, Slip joint plier, Adjustable slip plier, tweezers, Anti-static tweezers, Wire cutter, Utility knife, Screw driver, Hand drill, Power drill, Wire Wrapping tool, Wrapping tape, Hacksaw, File, Vice / Jammer, Soldering gun, Crimping tool, Different types of soldering guns, Desoldering pump, Continuity tester, Electric tester.	
Text and Reference Books:		
1.	Grob's Basic Electronics, Mitchel E. Schultz, 11th Edition, McGraw Hill	
2.	Practical Electronics: Components and Techniques, J.M. Hughes, O'Reilly Media, Inc.,	
3.	Troubleshooting and Repairing Major Appliances, Eric Kleinert, Third Edition, McGraw Hill	
4.	Troubleshooting Electronic Equipment, R.S. Khandpur, McGraw Hill (200	
5.	Consumer Electronics, S. P. Bali, Pearson (2008).	
Course (	<b>Dutcomes (COs): On completion of the course, the students will be able to:</b>	
CO1: Iden	ntify the electronic components.	
CO2: Ider	tify the electrical components.	
CO3: Iden	ntify the electronic tools.	
CO4: Iden	ntify the electrical tools.	
CO5: Uno	lerstand the specifications of the given components	
CO6: Lea	rn the use of various mechanical and electrical tools	

F. Y. B.Sc. Semester I			
Electronics Instruments			
Course	e code: ELCOET-112 No. of Credits: 2		
Unit	Contents		
No.			
	Introduction to electronic instruments (10)		
	Importance and role of electronic instruments, Basic concepts, and terminology, Overview		
т	of electronics laboratory instruments		
I	Analog and Digital Meters		
	Galvanometer, Voltmeter, Ammeter, Analog multi-meters, Digital panel meters (DPM).		
	Digital Multimeters (DMM), features, and specifications. Measurement of voltage, current,		
	resistance, and continuity, applications of millimeters in circuit testing and troubleshooting		
тт	Power Supplies (5)		
11	Fixed power Supplies, CVCC, SMPS, Mains adapters, UPS – Specifications, advantages		
	and disadvantages, applications		
ш	Function Generators (5)		
111	Function generator principle and operation, front panel controls, shape of output		
	waveforms, frequency and amplitude control, duty cycle control, applications		
	Oscilloscopes (10)		
IV	cathode Ray Oscilloscope (CRO) and Digital Storage Oscilloscope (DSO): Block diagram		
	and working, reatures, specifications, front panel control - time base, voltage magnification etc. Measurement of waveform parameters, CRO Probe types, CRO probe testing, setting		
	up and calibrating CRO/DSO, measurement of various parameters of waveform.		
Reference	ap and canorating CKO/DSO, incustrement of various parameters of waveform.		
Kelei elici			
1.	Electronic Instrumentation, H. S. Kalsi, TMH (2006)		
2.	Electronic Instrumentation and Measurement Techniques, W.D. Cooper, and A.D.		
3.	Helfrick, Prentice- Hall (2005).		
4.	Oscilloscope Fundamentals, Tektronix		
5.	User Manual and Operation Manual of the instruments in the laboratories.		
Course Outcomes (COs): On completion of the course, the students will be able to:			
CO1: List the various instruments used in electronics laboratories.			
CO2: Und	lerstand the operating principle of each instrument		
CO3: Illus	strate the functions of front panel control of the instrument		
CO4: Kno	CO4: Know the accessories required for operations of the instruments		
COS: Learn how to operate the instrument			
CO6:Dev	elop practical skills in using electronic instruments for measurement		

	F. Y. B.Sc. Semester II		
	Basics of Electronics		
Co	ourse code: ELCOET-121 No. of Credits: 2		
Unit	Contents		
Ι	Semiconductors Diode: (5) Classification of materials - insulators, metals and semiconductors, energy band theory (brief idea), intrinsic and extrinsic semiconductors, p and n type semiconductors, mechanism of current conduction in semiconductors, Formation of P-N junction, barrier potential Static V- I characteristic (qualitative), breakdown mechanism: Zener vs. Avalanche effect. Zener diode (as a voltage regulator), LED, Photo diode, Opto-coupler, diode as a rectifier.		
п	<b>Bipolar Junction Transistors (BJT): (5)</b> Basic structure and formation of BJT, different current components, different configuration of transistors (CB, CE, CC). Transistor parameters $\alpha$ and $\beta$ and DC biasing, transistor load-line and Q-point (concept), operating point and need for biasing. Thermal runaway (brief idea). Stability of transistor biasing: factors.		
III	Amplifiers and Oscillators: (5) CE amplifier, current and voltage gain, input and output impedance, power gain. large-signal amplifiers (concept). Feedback in amplifiers :negative and positive feedback, advantages of negative feedback General theory of feedback amplifier, Barkhausen criterion for oscillation, Different types of Oscillator,		
IV	<b>Field Effect Transistor: (5)</b> Junction Field Effect Transistor (JFET): N and P channel JFET, Metal Oxide Semiconductor Field Effect Transistor (MOSFET), n-channel (NMOS) and p-channel (PMOS), depletion and enhancement type MOSFETs, drain and transfer characteristics of MOSFET, FET parameters. Advantages of FETs over BJTs.		
V	Logic gates and Logic families: (5) Introduction to analog signals and digital signals, Positive and Negative logic, Logic gates: definition, symbols, truth tables, Boolean expressions of NOT, OR, AND, NAND, NOR, EX-OR, EX-NOR gates Different logic families: TTL, ECL, MOS & CMOS, specification, fan-out, power dissipation, propagation delay, noise margin,		
VI	Integrated Chips IC Design Technology: (5) Introduction to chip integration: Scale of integrations: SSI, MSI, LSI, VLSI, ULSI (basic idea only). Different ICs of logic gates. Study of Timer IC 555, Astable, Mono-stable and Bistable multivibrators		
Refere	eference Books:		
1. 2. 3.	Malvino Electronics Principles By- Malvino A. P. Ed-6, McGraw Hill publication. Modern DigitalElectronics By Jain R.P. Ed-4, Pub- Tata McGraw Hill publication India DigitalFundamentals By FloydT.M. Ed-11,Pub-Person Education Publication.		
Cours	e Outcomes (COs): On completion of the course, the students will be able to:		
CO1: CO2: CO3: CO4: C CO5:	Study and Explain construction details of various semiconductor devices. Explain operation, characteristics behavior, technical specification of various semiconductor devices. Explain needs and operation details of elementary electronic circuits and systems. Get familiar with concepts of digital electronics. Understand basic logic gates and different logic families.		
CO6:	Understand Integrated chips with reference to logic gates and timer IC555.		

## F. Y. B.Sc. Semester II

# Home appliances and E-Waste Management

## Course code: ELCOET- 122

No. of Credits: 2

Fundamentals of Services (10)		
Fundamentals of Services (10)		
<ul> <li>Fundamentals of Services (10)</li> <li>Selecting, purchasing, and installing major home appliances – Electric and Electronic ranges, cook tops and ovens, refrigerators and Freezers, dishwashers, air-conditioners, Television, AM FM Radio receiver, Emergency LED light, Inverters, Desk Top, rechargers</li> </ul>		
IIPreventive maintenance and safety (5)IIPreventive maintenance procedures for major home appliances – Electric and Electronic ranges Automatic Dishwashers, Automatic Electric Dryers, Electric ranges, Cooktops and Ovens, Microwave Oven, Refrigerators and Freezers, Room Air-conditioners,	s	
IIIIntroduction to E-Waste Management (5)Definition and types of e-waste, Current e-waste scenario in India and the world, Environmenta and health hazards of e-waste, Regulatory framework for e-waste management in India, Scope of the course.	al	
E-Waste Collection, Segregation and Recycling Technologies (10)Collection and transportation of e-waste, Segregation of e-waste based on material type,Importance of proper segregation, Hands-on practice on e-waste segregation.		
Recycling technologies for different types of e-waste, advantages, and limitations of different recycling technologies, Environmental impact of recycling technologies, Case studies of successful e-waste recycling initiatives		
Text and Reference Books:		
<ol> <li>Troubleshooting and Repairing Major Appliances, Eric Kleinert, Third Edition, .McGraw Hill</li> <li>Troubleshooting Electronic Equipment, R.S. Khandpur, . (2007) McGraw Hill</li> <li>Generating S.P.Beli, Deputy (2000)</li> </ol>		
<ol> <li>Consumer Electronics, S.P.Bail, Pearson (2008).</li> <li>Central Pollution Control Board, Ministry of Environment, Forest and Climate Change, Government of India. (2018). E-Waste Management in India: Issues and Challenges. Retrieved from http://www.commun.com/particle/commun.com/particle/commun.com/particle/commun.com/particle/commun.com/particle/commun.com/particle/commun.com/particle/commun.com/particle/commun.com/particle/c</li></ol>		
<ol> <li>Chatterjee, S., Kumar, A., &amp; Vats, A. (2018). E-waste management in India: A review. Journal of Clean Production, 181, 279-291.</li> </ol>	er	
vlev, A., Schmeda-Lopez, D. R., Corder, G. D., &Giurco, D. (2016). E-waste recycling: Where does it go om here? Resources, Conservation and Recycling, 109, 68-77.		
Course Outcomes (COs): On completion of the course, the students will be able to:		
CO1: Identify the different electronic products used in homes		
202. Study the electrical, electronics and gas related components 203: Classify the various skills related to home appliances for preventive maintenance and safety		
CO4: Outline the appliance service, installation, and preventive maintenance procedures		
CO5: List the effects of e-waste on environment and health.		
CO6: Discuss the need and requirements of the e-waste management.		
CO7: Make awareness of e-waste and e-waste management in society		

Electronics Practical (OE) Lab -5         Course code: ELCOEP- 231       No. of Credits: 2         Total 10 experiments are to be performed by student.         Contents         1       Total 10 experiments are to be performed by student.         Contents         1       Preparatory Experiment         Study of DSO and Signal generator (Parameters)         3       Study of DSO and Signal generator (Parameters)         Study of Switches, Fuses and Relays         Study of Various types of Batteries.         6         Study of Tools in Electronics Laboratories and practice of various soldering techniques.         Study of Tools in Electronics Laboratories and practice of various soldering techniques.         Study of Tools in Electronics Laboratories and practice of various soldering techniques.         Study of Tools in Electronics Laboratories and practice of various soldering techniques.         Study of Tools in Electronics Laboratories and practice of various soldering techniques.         Study of IC555         Note:- Preparatory Experiments are Compulsory. Take any 8 practicals from 3 to 13.         Electronics. Mitchel E. Schultz, 11 <sup>th</sup> Edition, .McGraw Hill		S. Y. B.Sc. Seme	ster III
No. of Credits: 2         Total 10 experiments are to be performed by student.         Contents         1         Note Credits: 2         Total 10 experiments are to be performed by student.         Contents         Study of Components and instruments.         2         Preparatory Experiment         Study of DSO and Signal generator (Parameters)         3.         Study of Suiches, Fuses and Relays         Study of various types of Batteries.         6.         Study of Tables, connector and Circuit Boards         7.         Study of Tables, connector and Circuit Boards         1.		Electronics Practical	(OE) Lab -5
Total 10 experiments are to be performed by student.           Contents           1. Preparatory Experiment Study of Components and instruments.           2. Preparatory Experiment Study of DSO and Signal generator (Parameters)           3. Study of DSO and Signal generator (Parameters)           3. Study of Switches, Fuses and Relays           5. Study of various types of Batteries.           6. Study of cables, connector and Circuit Boards           7. Study of Tools in Electronics Laboratories and practice of various soldering techniques.           9. Study of Tools in Electronics Laboratories and practice of various soldering techniques.           9. Study of rectifies           11. Testing of transistor and its study as amplifier           12. Study of logic gates           13. Study of IC555           Note:- Preparatory Experiments are Compulsory. Take any 8 practicals from 3 to 13.           teferences:           Grob's Basic Electronics, Mitchel E. Schultz, 11 <sup>th</sup> Edition, .McGraw Hill           Preparatory Experiments are Compulsory. Take any 8 practicals from 3 to 13.           Corderse Cutonics Components and Techniques, J.M. Hughes, O'Reilly Media, Inc.,           Troubleshooting and Repairing Major Appliances, Eric Kleinert, Third Edition, .McGraw Hill           Consumer Electronics, S.P.Bali, Pearson (2008).           Course Outcomes		Course code: ELCOEP- 231	No. of Credits: 2
Contents         1. Preparatory Experiment Study of components and instruments.         2. Preparatory Experiment Study of DSO and Signal generator (Parameters)         3. Study of DSO and Signal generator (Parameters)         3. Study of Switches, Fuses and Relays         5. Study of various types of Batteries.         6. Study of cables, connector and Circuit Boards         7. Study of Cables, connector and Circuit Boards         7. Study of Tools in Electronics Laboratories and practice of various soldering techniques.         9. Study and testing of different types of diodes.         10. Study of rectifies         11. Testing of transistor and its study as amplifier         12. Study of logic gates         13. Study of IC555         Note:- Preparatory Experiments are Compulsory. Take any 8 practicals from 3 to 13.         teferences:         Grob's Basic Electronics, Mitchel E. Schultz, 11 <sup>th</sup> Edition, .McGraw Hill         Preparatory Experiments are Compulsory. Take any 8 practicals from 3 to 13.         teferences:         Corb's Basic Electronics, Mitchel E. Schultz, 11 <sup>th</sup> Edition, .McGraw Hill         Preparatory Experiments are Compulsion (2007) McGraw Hill         Troubleshooting and Repairing Major Appliances, Eric Kleinert, Third Edition, .McGraw Hill         Consumer Electronics, S.P.Bali, Pearson (2		Total 10 experiments are to be p	erformed by student.
<ol> <li>Preparatory Experiment Study of components and instruments.</li> <li>Preparatory Experiment Study of DSO and Signal generator (Parameters)</li> <li>Study of DSO and Signal generator (Parameters)</li> <li>Study of Switches, Fuses and Relays</li> <li>Study of various types of Batteries.</li> <li>Study of adles, connector and Circuit Boards</li> <li>Study of Tools in Electronics Laboratories and practice of various soldering techniques.</li> <li>Study of rools in Electronics Laboratories and practice of various soldering techniques.</li> <li>Study of rools in Electronics Laboratories and practice of various soldering techniques.</li> <li>Study of rectifies</li> <li>Testing of transistor and its study as amplifier</li> <li>Study of logic gates</li> <li>Study of IC555</li> <li>Note:- Preparatory Experiments are Compulsory. Take any 8 practicals from 3 to 13.</li> </ol> <b>References:</b> <ul> <li>Grob's Basic Electronics, Mitchel E. Schultz, 11<sup>th</sup> Edition, .McGraw Hill</li> <li>Practical Electronics: Components and Techniques, J.M. Hughes, O'Reilly Media, Inc.,</li> <li>Troubleshooting Electronic Equipment, R.S. Khandpur,.(2007) McGraw Hill</li> <li>Consumer Electronics, S.P.Bali, Pearson (2008).</li> </ul> <b>Course Outcomes (COs): On completion of the course, the students will be able to:</b> <ul> <li>Able to identify different types of resistors, capacitors.</li> <li>Able to identify different types of Inductors and transformers.</li> <li>Able to identify different types of Inductors and transformers.</li> <li>Able to identify different types of inductors and transformers.</li> <li>Able to identify different types of inductors and transformers.</li> <li>Able to identify different types of inductors and transformers.</li> <li>Able to identify different types of inductors and transformers.</li> <li>Able to identify different types of inductors and transformers.</li> <li>Able to identify differen</li></ul>		Contents	
References:         . Grob's Basic Electronics, Mitchel E. Schultz, 11 <sup>th</sup> Edition, .McGraw Hill         . Practical Electronics: Components and Techniques, J.M. Hughes, O'Reilly Media, Inc.,         . Troubleshooting and Repairing Major Appliances, Eric Kleinert, Third Edition, .McGraw Hill         . Troubleshooting Electronic Equipment, R.S. Khandpur,.(2007) McGraw Hill         . Consumer Electronics, S.P.Bali, Pearson (2008).         Course Outcomes (COs): On completion of the course, the students will be able to:         ?O1: Able to identify different types of resistors, capacitors.         ?O1: Able to identify different types of Inductors and transformers.         ?O3: Able to select correct components according to application.         ?O4: Identify and select correct battery specification according to application.         ?O5: To acquire skill of use of Tools used in Electronics Laboratories.         ?O6: To acquire skill of soldering various components on zero PCB.	1. 2. 3. 4. 5. 6. 7. 8. 9. 10 11 12 13 *Note	Preparatory Experiment Study of components and instruments. Preparatory Experiment Study of DSO and Signal generator (Parameters) Study of Inductors and transformers Study of Switches, Fuses and Relays Study of Switches, Fuses and Relays Study of various types of Batteries. Study of cables, connector and Circuit Boards Study of Microphones and Loudspeakers Study of Tools in Electronics Laboratories and prac Study and testing of different types of diodes. Study of rectifies Testing of transistor and its study as amplifier Study of logic gates Study of IC555 Preparatory Experiments are Compulsory. Take any	tice of various soldering techniques. 8 practicals from 3 to 13.
<ul> <li>Grob's Basic Electronics, Mitchel E. Schultz, 11<sup>th</sup> Edition, .McGraw Hill</li> <li>Practical Electronics: Components and Techniques, J.M. Hughes, O'Reilly Media, Inc.,</li> <li>Troubleshooting and Repairing Major Appliances, Eric Kleinert, Third Edition, .McGraw Hill</li> <li>Troubleshooting Electronic Equipment, R.S. Khandpur,.(2007) McGraw Hill</li> <li>Consumer Electronics, S.P.Bali, Pearson (2008).</li> </ul> <b>Course Outcomes (COs): On completion of the course, the students will be able to:</b> Col: Able to identify different types of resistors, capacitors. Col: Able to identify different types of Inductors and transformers. Co3: Able to select correct components according to application. Co4: Identify and select correct battery specification according to application. Co5: To acquire skill of use of Tools used in Electronics Laboratories.	Refer	ences:	
<ul> <li>Practical Electronics: Components and Techniques, J.M. Hughes, O'Reilly Media, Inc.,</li> <li>Troubleshooting and Repairing Major Appliances, Eric Kleinert, Third Edition, .McGraw Hill</li> <li>Troubleshooting Electronic Equipment, R.S. Khandpur,.(2007) McGraw Hill</li> <li>Consumer Electronics, S.P.Bali, Pearson (2008).</li> </ul> <b>Course Outcomes (COs): On completion of the course, the students will be able to:</b> Col: Able to identify different types of resistors, capacitors. Col: Able to identify different types of Inductors and transformers. Co3: Able to select correct components according to application. Co4: Identify and select correct battery specification according to application. Co5: To acquire skill of use of Tools used in Electronics Laboratories. Co6: To acquire skill of soldering various components on zero PCB.	1. Gi	ob's Basic Electronics, Mitchel E. Schultz, 11th Edition	on, .McGraw Hill
<ul> <li>Troubleshooting and Repairing Major Appliances, Eric Kleinert, Third Edition, .McGraw Hill</li> <li>Troubleshooting Electronic Equipment, R.S. Khandpur,.(2007) McGraw Hill</li> <li>Consumer Electronics, S.P.Bali, Pearson (2008).</li> </ul> Course Outcomes (COs): On completion of the course, the students will be able to: C01: Able to identify different types of resistors, capacitors. C01: Able to identify different types of Inductors and transformers. CO3: Able to select correct components according to application. C04: Identify and select correct battery specification according to application. C05: To acquire skill of use of Tools used in Electronics Laboratories. C06: To acquire skill of soldering various components on zero PCB.	2. Pr	actical Electronics: Components and Techniques, J.M	Hughes, O'Reilly Media, Inc.,
<ul> <li>Troubleshooting Electronic Equipment, R.S. Khandpur, (2007) McGraw Hill</li> <li>Consumer Electronics, S.P.Bali, Pearson (2008).</li> </ul> Course Outcomes (COs): On completion of the course, the students will be able to: C01: Able to identify different types of resistors, capacitors. C01: Able to identify different types of Inductors and transformers. C03: Able to select correct components according to application. C04: Identify and select correct battery specification according to application. C05: To acquire skill of use of Tools used in Electronics Laboratories. C06: To acquire skill of soldering various components on zero PCB.	3. Tr	oubleshooting and Repairing Major Appliances, Eric	Kleinert, Third Edition, .McGraw Hill
<ul> <li>Consumer Electronics, S.P.Bali, Pearson (2008).</li> <li>Course Outcomes (COs): On completion of the course, the students will be able to:</li> <li>Col: Able to identify different types of resistors, capacitors.</li> <li>Col: Able to identify different types of Inductors and transformers.</li> <li>Co3: Able to select correct components according to application.</li> <li>Co4: Identify and select correct battery specification according to application.</li> <li>Co5: To acquire skill of use of Tools used in Electronics Laboratories.</li> <li>Co6: To acquire skill of soldering various components on zero PCB.</li> </ul>	4. Tr	oubleshooting Electronic Equipment, R.S. Khandpur,	(2007) McGraw Hill
<ul> <li>Course Outcomes (COs): On completion of the course, the students will be able to:</li> <li>CO1: Able to identify different types of resistors, capacitors.</li> <li>CO1: Able to identify different types of Inductors and transformers.</li> <li>CO3: Able to select correct components according to application.</li> <li>CO4: Identify and select correct battery specification according to application.</li> <li>CO5: To acquire skill of use of Tools used in Electronics Laboratories.</li> <li>CO6: To acquire skill of soldering various components on zero PCB.</li> </ul>	5. Co	onsumer Electronics, S.P.Bali, Pearson (2008).	
<ul> <li>2O1: Able to identify different types of resistors, capacitors.</li> <li>2O1: Able to identify different types of Inductors and transformers.</li> <li>2O3: Able to select correct components according to application.</li> <li>2O4: Identify and select correct battery specification according to application.</li> <li>2O5: To acquire skill of use of Tools used in Electronics Laboratories.</li> <li>2O6: To acquire skill of soldering various components on zero PCB.</li> </ul>	Cou	rse Outcomes (COs): On completion of the course	e, the students will be able to:
<ul> <li>201: Able to identify different types of Inductors and transformers.</li> <li>203: Able to select correct components according to application.</li> <li>204: Identify and select correct battery specification according to application.</li> <li>205: To acquire skill of use of Tools used in Electronics Laboratories.</li> <li>206: To acquire skill of soldering various components on zero PCB.</li> </ul>	CO1:	Able to identify different types of resistors, capacitors	
203: Able to select correct components according to application. 204: Identify and select correct battery specification according to application. 205: To acquire skill of use of Tools used in Electronics Laboratories. 206: To acquire skill of soldering various components on zero PCB.	CO1:	Able to identify different types of Inductors and transf	ormers.
204: Identify and select correct battery specification according to application. 205: To acquire skill of use of Tools used in Electronics Laboratories. 206: To acquire skill of soldering various components on zero PCB.	CO3:	Able to select correct components according to application	ation.
205: To acquire skill of use of Tools used in Electronics Laboratories. 206: To acquire skill of soldering various components on zero PCB.	CO4:	Identity and select correct battery specification accord	ing to application.
to acquire skill of soldering various components on zero PCB.	CO5:	To acquire skill of use of Tools used in Electronics La	boratories.
107: To acquire knowledge of different electronics components and its use in circuits	CO0	To acquire skill of soldering various components on z	elorob.

## S. Y. B.Sc. Semester IV

### **Electronics Practical (OE) Lab -6**

### Course code: ELCOEP- 241

### No. of Credits: 2

#### Contents

• As students are from non-science streams, the knowledge imparted so far is not sufficient. So far they just acquainted to basics of electronics. They are not aware of latest developments in a subject. Considering this fact This course is combination of Theory and practical.

Guide lines are as follows:

- Each student is expected to perform 2 Hobby projects in this semester.
- Per teacher 10 students are allotted.
- Maximum 2 students are allowed in one group.
- Teacher should guide them for feasibility of different circuit ideas suggested by student.
- He should also provide theoretical support needed for the project.
- In special case if cost and complexity of project is too much then more number of students are allowed to accommodate in single project.
- After 15 days student should approach the respective guide to provide the project progress.
- Evaluation process: -
  - 1. Continuous and cumulative evaluation after 15 days.
  - 2. Project demonstration along with Handwritten project report.
  - 3. Project oral/Presentation.
  - 4. Report should not be copy written.

#### **References:**

- 6. Grob's Basic Electronics, Mitchel E. Schultz, 11<sup>th</sup> Edition, .McGraw Hill
- 7. Practical Electronics: Components and Techniques, J.M. Hughes, O'Reilly Media, Inc.,
- 8. Troubleshooting and Repairing Major Appliances, Eric Kleinert, Third Edition, .McGraw Hill
- 9. Troubleshooting Electronic Equipment, R.S. Khandpur, (2007) McGraw Hill
- 10. Consumer Electronics, S.P.Bali, Pearson (2008).

#### Course Outcomes (COs): On completion of the course, the students will be able to:

CO1: Able to identify technical specifications & types of resistors, capacitors, Inductors and transformers. CO1: Able to select correct components according to application.

CO1. Able to select correct components according to application.

CO3: Identify and select correct battery specification according to application.

CO4: To acquire skill of identify technical specifications of Tools used in Electronics Laboratories.

CO5: To acquire skill of ordering and purchasing correct electronic components from market.

CO6: To acquire skill of soldering various components on zero PCB.

CO7: To acquire knowledge of different electronics components and its use in circuits