परिपत्रक - UG (1) ST

॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

'ज्ञानतीर्थ', विष्णुपुरी, नांदेड – ४३१ ६०६ (महाराष्ट्र राज्य) भारत

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

Established on 17th September, 1994, Recognized By the UGC U/s 2(f) and 12(B), NAAC Re-accredited with 'B++' grade

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Academic-1 (BOS) Section

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E-mail: bos@srtmun.ac.

विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत राष्ट्रीय शैक्षणिक धोरण २०२० नुसार पदवी प्रथम वर्षाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२४–२५ पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, या विद्यापीठा अंतर्गत येणा–या सर्व संलग्नित महाविद्यालयामध्ये शैक्षणिक वर्ष २०२४–२५ पासून पदवीस्तरावर राष्ट्रीय शैक्षणिक धोरण –२०२० लागू करण्याच्या दृष्टीकोनातून विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत येणा–या अभ्यासमंडळांनी तयार केलेल्या पदवी प्रथम वर्षाचे अभ्यासक्रमांना मा. विद्यापरिषदेने दिनांक १५ मे २०२४ रोजी संपन्न झालेल्या बैठकीतील विषय क्रमांक १५/५९–२०२४ च्या ठरावाअन्वये मान्यता प्रदान केली आहे. त्यानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील खालील बी. एस्सी प्रथम वर्षाचे अभ्यासक्रम (Syllabus) लागू करण्यात येत आहेत.

1) B. Sc. I year - Botany
2) B. Sc. I year - Seed Technology
3) B. Sc. I year - Horticulture
4) B. Sc. I year - Geology
5) B. Sc. I year - Dairy Science
6) B. Sc. I year -Electronics
7) B. Sc. I year - Environmental Science
8) B. Sc. I year - Fishery Science
9) B. Sc. I year - Mathematics
10) B. Sc. I year - Microbiology
11) B. Sc. I year - Agricultural Microbiology
12) B. Sc. I year - Physics
13) B. Sc. I year - Food Science
14) B. Sc. I year – Computer Science (N M D College Hingoli)

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या **www.srtmun.ac.in** या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी, ही विनंती.

डॉ. सरिता लोसरवार
सहा.कुलसचिव
शैक्षणिक (१–अभ्यासमंडळ) विभाग

'ज्ञानतीर्थ' परिसर,
विष्णुपुरी, नांदेड – ४३१ ६०६.
जा.क्र.:शै–१/एनइपी/विवत्रंविपदवी/२०२४–२५/९१२
दिनांक १२.०६.२०२४

प्रत : १) मा. आधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
२) मा. संचालक, परीक्षा व मुल्यमापन मंडळ, प्रस्तुत विद्यापीठ.
३) मा. प्राचार्य, सर्व संबधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
४) मा. संचालक, सर्व संकुले परिसर व उपपरिसर, प्रस्तुत विद्यापीठ
५) मा. प्राचार्य, न्यू मॉडल डिग्री कॉलेज हिंगोली.
६) सिस्टीम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. याना देवून कळविण्यात येते की, सदर परिपत्रक संकेतस्थळावर प्रसिध्द करण्यात यावे.

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED - 431 606 (MS)

(Credit Framework and Structure of Four Year UG Program with Multiple Entry and Exit Option as per NEP-2020)

UNDERGRADUATE PROGRAMME OF

SCIENCE & TECHNOLOGY

Major in **Electronics** and Minor in **DSM** (Subject)

Under the Faculty of Science & Technology

(Revised as per the Govt. Of Maharashtra circular Dt. 13th March 2024)

Effective from the Academic year 2024 – 2025

(As per NEP-2020)

Details of the Board of Studies Members in the subject Electronics under the faculty of Science & Technology of S.R.T.M. University, Nanded

Sr No	*Name of the Member*	*Designation*	*Address*	*Contact No.*
1	Prof. A C Kumbharkhane	Chairman	School of Physical Sciences, SRTM University, Nanded	9421869112
2	Prof. Y S Joshi	Member	Lal Bahadur Shastri Mahavidyalaya, Dharmabad	9405362172
3	Prof. S M Yenorkar	Member	Shri Shivaji College Parbhani	7276532176
4	Dr S K Gore	Member	Dnyanopasak Mahavidyalya, Jintur	9422879596
5	Dr M B Swami	Member	Maharashtra Udaygiri Mahavidyalaya, Udgir	8830089774
6	Dr D B Suryawanshi	Member	Shri Havgiswami College, Udgir	9423307098
7	Dr R S Kawale	Member	Dnyanopasak Mahavidyalya, Jintur	9545231648
8	Prof. I G Shere	Member	Shri Havgiswami College, Udgir	8329792082
9	Prof. Vikas Baburao Patil	Member	Punyashlok Ahilyadevi Holkar Solapur University, Solapur	9422532521
10	Prof. Girish Mukundrao Joshi	Member	Institute of Chemical Technology (ICT), Mumbai Marathwada Campus, Jalna	8838660102
11	Prof. R L Raibagkar	Member	Deptt. of Physics, Gulbarga University, Kalburgi	9739302083
12	Shri Jagdish Arun Deshmukh	Member	Cermet Resistronics, Pvt. Ltd. Pune	9623371844
13	Shri Arun Pandit Potdar	Member	Micromax Instruments Pvt. Ltd. Pune	9822061328
14	Miss. Shruti Mahesh Tiwari	Invitee Member (UG Student)	Lal Bahadur Shastri Mahavidyalaya, Dharmabad	
15	Shrise Sayantra Maroti	Invitee Member (PG Student)	Yeshwant Mahavidyalaya, Nanded	

Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

General Guidelines for Selection of Courses

i. The **Major subject** is the discipline or course of main focus, bachelors' degree shall be awarded in that Discipline / subject.

ii. **Minor Subject(s)** is/are the subjects from the same discipline / faculty and shall act as supporting subjects to the Major.

iii. At the entry level of the 3/4-year UG program students shall be required to choose any THREE of the available subjects in a college/institute as **Major (Optional 1), Minor 1 (Optional 2) and Minor 2 (Optional 3) subjects, respectively**

iv. No. of credits assigned to the **Major (Optional 1), Minor 1 (Optional 2) and Minor 2 (Optional 3) shall be same in Semesters I and II.**

v. **In the second year of the degree program students shall select one of the three subjects (Optional 1, 2 and 3) as a Major Subject and one as Minor Subject, while third optional shall be discontinued.**

vi. Students shall have an option to switch over from **Major to Minor or vice-versa after first year**.

vii. Once they finalize their **Major subject** in the beginning of the second year of the programme, they shall pursue their further education in that particular subject as the **Major** subject. Therefore, from second year onwards curriculum of the **Major** and **Minor** subjects shall be different.

viii. Students are required to select **Generic /Open Elective** (**vertical 3 in the credit framework**) compulsorily from the **faculties different than that of their Major / Minor subjects** (select from **Basket 3**).

ix. Content and other details of the GE are available in the document prepared by the respective BOS from which the candidate has chosen his/her GE.

x. Students shall be required to complete the Skill based courses of 06 credits in the first two years.

xi. Vocational Courses (VSEC or VSC) shall be related to the **Major** course

xii. Ability Enhancement Courses (AEC):

a) English Communication Course (Language) of 2 credits shall be offered in Semester I and III

b) Modern Indian Languages shall be of 2 credits and shall be offered in Semester II and IV

xiii. Courses marked as VEC, CI, IKS and CCC in Column Nos. 7and 8 shall be common for all the students irrespective of their faculties of studies.

xiv. Curriculum of VEC, CI, IKS and CCC shall be provided by the University separately.

B.Sc. FY (Electronics) (Semester I)

SELECT1101 (Theory): Fundamentals of Analog & Digital Electronics

Periods: 30 Hours **Max. Marks: 50** [ESE:40 & CA:10] **Credits : 2**

Course Pre- requisite: HSC (XIIth Science) pass

Course Objectives:

1. To impart knowledge of basic concepts in analog & digital electronics.
2. To understand the various laws and concepts of network theorems for circuit analysis.
3. To learn various number systems used in digital electronics.
4. To learn & understand various logic gates and Boolean Rules & laws.

Course Outcome: After completion of this course students will be -

1. able to apply the knowledge to analyze the series and parallel circuits.
2. able to apply the knowledge of circuit analysis to real life problems.
3. able to solve complex circuits using network theorem and analyse the linear electronic circuits.
4. able to understand the fundamental concepts and techniques used in digital electronics.
5. able to perform inter conversions of the various number systems its and application in digital electronics.
6. Students will get the knowledge of Logic gates and Boolean laws.

Curriculum Details:

SELECT1101 (Theory): Fundamentals of Analog & Digital Electronics

Module No.	Unit No.	Topic	No. of hours. required to cover the contents
1		**Basic Circuit Analysis**	**07**
	1.1	Ohm's Law: relation between voltage, current, and resistance, Kirchhoff's Current Law (KCL), Kirchhoff's Voltage Law (KVL), Sign Conventions for Battery EMF and IR Drop on resistors.	
	1.2	Series Circuits: Proportional Voltage Formula and Voltage Divider, Opens and Shorts in Series circuit.	
	1.3	Parallel Circuits: Proportional Current Formula, Opens and Shorts in Parallel circuit. (Book – 1)	
2		**Network Theorems**	**08**
	2.1	Ideal constant-voltage source, ideal constant-current source	
	2.2	Super Position theorem	
	2.3	Thevenin theorem, Norton theorem and how to Thevenize and how to Nortonise given circuit	
	2.4	Maximum Power Transfer theorem (Book – 2)	
3		**Number Systems and Codes**	**07**
	3.1	Decimal, Binary Octal and Hexadecimal number systems, inter conversions of number systems	
	3.2	Binary arithmetic (addition, subtraction, multiplication, division)	
	3.3	Codes: BCD, Gray code, Conversion of BCD to Binary,Binary to Gray code and vice versa.	
4		**Logic Gates and Boolean Laws**	**08**
	4.1	Positive logic, Negative logic	
	4.2	Definition, symbol and truth table of NOT, OR, AND, NAND, NOR, EX-OR, EX-NOR gates	
	4.3	De-Morgan's theorem	
	4.4	Universal properties of NAND and NOR gates	
	4.5	Boolean Rules and Laws.	
		Total	**30**

Text Books:

1. Basic Electronics Solid State (Multicolor illustrative edition), by B. L. Theraja, S. Chand & Company Pvt. Ltd, New Delhi
2. A Textbook of Electrical Technology, by B.L. Theraja, Vol.1, Nirja Construction & Development Company.
3. Digital Principles & Applications by A.P. Malvino & D.P. Leach (TMH, New Delhi)
4. Modern Digital Electronics by R.P. Jain, Tata McGraw Hill Publication.
5. Digital Fundamentals by Floyd, Pearson Education.

Recommended Books/References:

1. A Text book of Applied Electronics by R. S. Sedha, Revised Edition 2013, Reprint 2017 S. Chand & Company Ltd., New Delhi
2. Principles of Electronics (Multicolour Revised Edition), by V.K. Mehta, Rohit Mehta, S. Chand & Company, Ram Nagar, New Delhi.
3. Basic Electronics (eighth edition), by Bernard Grob, Pub.: Glencoe Mc Graw Hill, Pub.Co.
4. Digital Electronics: W. H. Gothman Prentice Hall , India.
5. Fundamentals of Digital Circuits by A. Anand Kumar, 3rd Edn, PHI Learninig Pvt. Ltd. Delhi.
6. Digital Electronics with practical approach –G N Shinde, Shivani Pub. Nanded.
7. Android based App – 'Electronics' and similar
8. https://www.falstad.com/circuit/e-index.html (for circuit simulator applets).

B.Sc. FY (Electronics) (Semester I)

SELECP1101: Electronics Lab-I: Practical based on SELECT1101

Periods :60 Hours **Max. Marks: 50** [ESE:30 & CA:20] **Credits : 2**

Course Objectives: Students are expected to:

1. Familiarize with basic electronics components, testing and measuring instruments.
2. Understand the practical use of various networks theorems
3. Study the electronics circuit analysis and verification of the circuits
4. get the practical knowledge of various logic gate ICs

Course outcomes: After completion of this course -

1. Students will get the basic knowledge of electronic components and measuring instruments and their applications.
2. Understand and analyse, linear and digital electronic circuits.
3. Review, prepare and present technological developments.

Curriculum Details:

SELECP1101: Electronics Lab-I - Practical based on SELECT1101

Group I :

1. Identification of electronic components: Resistors, Capacitors, Inductors, transformers, diodes & transistors.
2. Study of electronic instruments: Voltmeter, Ammeter and Multimeter.
3. Study of Electronic instruments: Power supply, signal generator and CRO.
4. Determination of value of given resistors by using colour code method & verification of it by multimeter.
5. Verification of Kirchhoff's laws.
6. Determination of amplitude, frequency and time period of observed voltage waveform by using CRO.
7. Verification of Thevenin's theorem.
8. Verification of Superposition Theorem
9. Verification of Norton's theorem
10. Study of Maximum power transfer theorem and determination of internal resistance of a source.

Group II :

1. Study of basic gates (verification of truth table) using ICs.
2. Study of Universal gates (NAND & NOR) and Special gates (EX-OR & EX-NOR) using ICs.
3. Construction and verification of basic gates using NAND gates.
4. Construction and verification of basic gates using NOR gates.
5. Verification of De Morgan's theorems.
6. 4-bit Binary to Gray converter using IC 7486.
7. 4-bit Gray to Binary converter using IC 7486.

Note:

i. Every student must perform at least **10** experiments, not less than **Four** Experiments from each group.

ii. Use graphs wherever necessary.

B.Sc. FY (Electronics) (Semester I)

SELEGE1101 [Generic Elective (GE) 1]: Electronic Components

Periods :30 Hours **Max. Marks: 50** [ESE:40 & CA:10] **Credits: 2**

Course Pre- requisite: HSC (XIIth) pass from any faculty

Course Objectives:

1. To impart basic knowledge of electronic components to the students from other faculty.
2. To familiarize students with the concepts of active and passive components and terminology in electronics.
3. To help the students to understand the role of components in simple electronic circuits.

Course Outcome: After completion of this course

1. Students can identify the various electronic components.
2. Students will understand the applications of electronic components in electronic circuits.

Curriculum Details:

SELEGE1101 [Generic Elective 1]: Electronic components

Module No.	Unit No.	Topic	No. of hours. required to cover the contents
1		**Introduction to Electronic Components**	**08**
	1.1	Overview the use of electronics components and their importance in everyday life. Concepts of active and passive components and terminology in electronics	
	1.2	Introduction to common electronic components: resistors, capacitors, inductor, diodes, and transistors	
	1.3	Understanding the role of components in simple electronic circuits	
2		**Resistors, Inductors and Capacitors**	**09**
	2.1	Detailed exploration of resistors: types, color coding, resistance values, and applications. Understanding the behavior of resistors in circuits: Ohm's law, series and parallel connection	
	2.2	Introduction to inductor, types and values and applications of inductor	
	2.3	Introduction to capacitors: types, capacitance values, and applications	
3		**Diodes and Transistors**	**07**
	3.1	Study of diodes: types (semiconductor diode, light-emitting diodes), characteristics, and applications Understanding diode behavior: forward bias, reverse bias, and rectification	
	3.2	Introduction to transistors: types (e.g., bipolar junction transistors, field-effect transistors), configurations, and applications Exploring transistor operation modes: cutoff, saturation, and active region	
4		**Integrated Circuits**	**06**
	4.1	Overview of integrated circuits (ICs): types (e.g., logic gates, OP AMP), functionality, and applications, Introduction to IC packaging and pin configurations	
		Total	**30**

Text Books:

1. Electronics Circuit Design: S. N. Talbar & Dr. T. R. Sontake
2. Basic Electronics (Eight Edition) by Bernard Grob: Glance Mc Graw Hill, Pub. Company.
3. Principal of Electronics (Multicolor revised edition) by V. K. Mehta, Rohit Mehta, S. Chand Pub.
4. Op-Amp and Linear Integrated Circuits by Ramakant Gaikwad, Prentice Hall of India Pvt Ltd
5. Handbook of Electronics by Gupta, Kumar, 44thEdn, 2017, Pragati Prakashan, Meerut.
6. Electronic Components and Materials by Madhuri Joshi, 3rd edn. Mc Press, 2010
7. Basics of Electronic Components, M B Swami & P G Hudge, Aruna Prakashan, Latur, 2024

B.Sc. FY (Electronics) (Semester I)

SELESC1101: Electronic Measurements and Instrumentation (Skill)

Periods :60 Hours **Max. Marks: 50** [ESE:30 & CA:20] **Credits: 2**

Course Pre- requisite: HSC (XIIth) science pass

Course Objectives:

1. To introduce basic measurement instruments
2. To learn measurement of various electrical quantities.
3. To learn measuring instruments like Oscilloscope and digital meters

Course Outcomes: After completion of this course

1. Student will acquire basic knowledge about measurement systems
2. Students will able to measure ac and dc quantities.
3. Students will be able to familiar with oscilloscopes and digital meters.

Curriculum Details:

SELESC1101: Electronic Measurements and Instrumentation.

Module No	Unit No	Topic	Hrs. Required to cover the contents
1		**Basic Measurement Instruments**	**15**
	1.1	Introduction: Characteristics of instruments, Static and dynamic, error, types of errors, sources of errors	
	1.2	Basic D'Arsonval meter construction and working principle of operation.	
	1.3	DC measurement. Conversion of basic meter into DC voltmeter and multimeter.	
	1.4	AC measurement: Voltmeter, ammeter Digital type voltmeter, digital multimeters.	
2		**DC and AC Bridges**	**15**
	2.1	Measurement of low resistance by Kelvin's double bridge method, Measurement of medium resistance by wheatstone bridge. Measurement of high resistance, difficulties in measurement in high resistance.	
	2.2	Measurement of self inductance: Maxwell's inductance bridge, Owen's bridge	
	2.3	Measurement of Capacitance: DeSauty's bridge	
3.		**Oscilloscopes**	**15**
	3.1	CRT, Wave form display and electrostatic focusing, time base and sweep synchronization	
	3.2	Measurement of voltage, frequency and phase by CRO	
	3.3	Sampling Oscilloscope, Digital Storage Oscilloscope	
4.		**Digital Instruments**	**15**
	4.1	Principle of working of digital meters,	
	4.2	characteristics of digital meter,	
	4.3	digital voltmeter, digital multimeter	
	4.4	Connectors and probes: low capacitance probe, high voltage probes, identifying electronic connectors- audio and video, RF, Co-axial and USB	
		Total	**60**

Books:

1. Electronic Instrumentation by H. S. Kalsi, TMH publication.
2. Electrical and Electronic measurements and instrumentation by A. K. Sawhney, Dhanpat Rai and sons 2007.-
3. Electronic Instrumentation and Measurement Techniques, W. D. Cooper and A. D. Helfrick, Prentice Hall (2005).
4. Instrumentation Devices and Systems, S. Rangan, G. R. Sarma and V. S. Mani, Tata Mcgraw Hill
5. Instrumentation, Measurement and Analysis by B. S. Nakara and V. S. Mani (TMH)
6. Basic Electronics Solid State (Multicolor illustrative edition), B. L. Theraja, S. Chand & Company Ltd. New Delhi.

B. Sc. FY (Electronics) (Semester II)

SELECT1151 (Theory): Electronic Devices and Digital Logic Circuits

Periods: 30 Hours **Max. Marks: 50** [ESE: 40 & CA:10] **Credits : 2**

Course Pre- requisite: SELECT1101 (Theory): Fundamentals of analog & digital Electronics

Course Objectives:

1. To impart knowledge of semiconductor devices and their characteristics
2. To learn the construction and characteristics of transistors.
3. To introduce to data processing logic circuits.
4. To introduce to various Flip-Flops.

Course Outcome: After completion of this course Students will –

1. get the knowledge of working of various semiconductor diodes and transistor.
2. understand the applications of diodes and transistors.
3. be able to use of arithmetic and data processing circuits.
4. be able to understand various types of Flip flop.

Curriculum Details:

SELECT1151 (Theory): Electronic Devices and Digital Logic Circuits

Module No.	Unit No.	Topic	No. of hours. required to cover the contents
1		**Semiconductor Diodes**	**07**
	1.1	Semiconductor: Intrinsic, Extrinsic, P-type, N-type, PN junction diode –formation/construction, Formation of Depletion Layer, forward and reverse biasing and V-I characteristics.	
	1.2	Idea of static and dynamic resistance.	
	1.3	Zener diode- V-I characteristics, Zener and avalanche breakdown Reverse saturation current	
	1.4	Construction, working and characteristics of LED, photodiode, varactor diode. (Book-1)	
2		**Transistors**	**08**
	2.1	Construction and operation of BJT (NPN and PNP), Regions of operation (active, cut off and saturation), F-F, R-R, F-R biasing,	
	2.2	Current gains α_{dc} and β_{dc} of a transistor and their relationship, C-E transistor characteristics: collector curves and base curves.	
	2.3	Construction, working and characteristics of UJT. (Book-2)	
3		**Arithmetic & Data Processing Circuits**	**08**
	3.1	Half Adder, Full Adder, realization of half and full adder using Gates, 4-bit parallel binary adder. Introduction to multiplexers (MUXs), designing of 2:1 MUX, 4:1 MUX, and 8:1 MUX,	
	3.2	Introduction to demultiplexers (DEMUX), designing of 1:2 DEMUX, 1:4 DEMUX, and 1:8 DEMUX,	
	3.3	Encoders: decimal to BCD encoder, priority encoder	
	3.4	Decoders: BCD to decimal decoder, BCD to seven segment decoder	**07**
4		**Flip-Flops**	
	4.1	1-bit memory cell, S-R flip-flop, clocked S-R flip-flop, preset and clear facility in flip–flop	
	4.2	J–K flip- flop, race around condition, master-slave JK Flip Flop	
	4.3	D-type and T-type flip flop.	**30**

Text Books:

1. Principles of electronics by V.K. Mehta & Rohit Mehta (Multicolour revised edition) S.Chand & Company.
2. Electronic principles, A.P. Malvino, Tata Mc. Graw Hill, Pub. Co.Ltd., (Third edition).
3. Digital Principles & Applications by A.P. Malvino& D.P. Leach (TMH, New Delhi)
4. Modern Digital Electronics by R.P. Jain, Tata McGraw Hill Publication.
5. Digital Fundamentals by Floyd, Pearson Education.
6. Basics of Electronic Components, M B Swami & P G Hudge, Aruna Prakashan, Latur, 2024

Recommended Books/References:

1. Basic electronics (solid state) by B.L. Theraja, (multicolour illustrative edition),S.Chand& Company Ltd., Ram Nagar, New Delhi.
2. A Text book of Applied Electronics by R. S. Sedha, Revised Edition 2013, Reprint 2017 S. Chand & Company Ltd., New Delhi
3. Basic electronics by Bernard Grob, Glencoe, (8th Edn) Mc. Graw Hill Pub.Company.
4. Digital Electronics: W. H. Gothman Prentice Hall , India.
5. Fundamentals of Digital Circuits by A. Anand Kumar, 3rd Edn, PHI Learninig Pvt. Ltd. Delhi.
6. Digital Electronics with practical approach –G N Shinde, Shivani Pub. Nanded.
7. Android based App – 'Electronics' and similar
8. https://www.falstad.com/circuit/e-index.html (for circuit simulator applets).

SELECP1151: Electronics Lab-II: Practical based on SELECT1151

Periods :60 Hours **Max. Marks : 50** [ESE:30 & CA:20] **Credits : 2**

Course Objectives:

Students are expected to:

1. Familiarize with various Semiconductor devices.
2. To understand the behavior of semiconductor devices.
3. Understand the practical use of various semiconductor devices.

Course outcome:

Learner will be able to ….

1. Apply the concept and knowledge of Semiconductor devices.
2. Apply practical knowledge to solve real life problems of the society.
3. Understand of the course and create scientific temperament and give exposure to the students for independent use of digital integrated circuit chips for innovative applications.

Curriculum Details:

SELECP1151: Electronics Lab-II : Practical based on SELECT1151

Group I :

1. Study of P-N junction diode characteristics and determination of bulk resistance.
2. Study of LED characteristics.
3. Study of Photo diode characteristics.
4. Study of Varactor diode characteristics.
5. Study of Zener diode characteristics and determination of breakdown voltage.
6. Study of Common-Emitter transistor characteristics and determination of βdc.
7. Study of UJT characteristics.

Group II :

1. Construction and study of half adder using NAND gates.
2. Construction and study of full adder using NAND gates.
3. Study of 4:1 Multiplexer
4. Study of 1:4 Demultiplexer
5. Study of decimal to BCD encoder
6. Construction and study of JK, T-type and D-type flip-flops using IC 7476.

Note:

i. Every student must perform at least **10** experiments, not less than **Four** Experiments from each group.

ii. Use graphs wherever necessary

B.Sc. FY (Electronics) (Semester II)

SELEGE1151 (Theory): Consumer Electronics

Generic Elective (GE)

Periods: 30 Hours **Max. Marks: 50** [ESE:40 & CA:10] **Credits: 2**

Course Pre- requisite: Electronic Components (SELEGE1101)

Course Objectives:

To develop an ability

1. To explain working of microphone and speakers.
2. To describe DTH and Colour TV.
3. To know working of camera and photocopier.

Course Outcomes:

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

1. Describe working of microphone and speakers.
2. Explain the working of DTH and Colour TV.
3. Understand working of camera and photocopier.

Curriculum Details : **SELEGE1152: Consumer Electronics**

Module No	Unit No	Topic	Hrs. Required to cover the contents
1		**Microphone and Speakers**	**08**
	1.1	Sound characteristics: level & loudness, pitch, sensitivity, selectivity & fidelity	
	1.2	Working principles of microphone	
	1.3	Types of microphone: carbon, condenser, crystal, electrets and tie clip	
	1.4	Working principle of speaker	
2		**DTH and Colour TV**	**08**
	2.1	Block diagram of colour TV and working	
	2.2	Working of LCD & LED TV	
	2.3	Direct To Home (DTH) receiver block diagram	
	2.4	Block diagram of OLED and function of each block	
3		**Digital Camera and Photocopier**	**07**
	3.1	Pick up Devices in digital camera and cam coder	
	3.2	Picture processing and picture storage	
	3.3	Block diagram of photocopier and its functions	
4		**Domestic Consumer Appliances**	**07**
	4.1	Microwave oven	
	4.2	Automatic washing machine: principle and working	
		Total	**30**

Textbooks:

1. Consumer Electronics by Bali S P, Pearson Education, India, 2007
2. Audio Video System: Principle, Practices and Troubleshooting, Bali Rajeev, Bali S.P., Khanna Publishers, 2014
3. Audio Video System: Principle, Maintenance and Troubleshooting, Gupta R.G., McGraw Hill, New Delhi, 2010
4. Modern Television Practice: Transmission, Reception and Applications, Gulati R.R., New Age International, New Delhi, 2015
5. Television and Video Engineering, Dhake A.M. McGraw Hill, New Delhi, 2006

B.Sc. FY (Electronics) (Semester II)

SELESC1151: AC fundamentals & Electronic Circuits

Periods :60 Hours **Max. Marks: 50** [ESE:30 & CA:20] **Credits: 2**

Course Pre- requisite: B.Sc. I Sem Electronics Pass

Course Objectives:

1. To know basic electronic circuit designing of practical importance.
2. To equip the students with skill of circuit designing for a given requirement.
3. To impart hands on practice: circuit assembling, testing and designing.

Course Objectives: After completion of this course

1. Student can develop electronic circuits
2. Student will able to assemble, design the electronic circuits

Curriculum Details :

SELESC1151: AC Fundamentals & Electronic Circuits

Module No	Unit No	Topic	Hrs. Required to cover the contents
1		**Phasor Algebra and AC Fundamentals**	**15**
	1.1	Symbolic notation, Significance of Operator 'j', various forms of vector representation	
	1.2	Types of alternating waveforms, cycle, time period, frequency, amplitude of ac voltage/current, Characteristics of sine wave, different values of sinewave voltage/current, phase, phase difference.	
	1.3	RL, RC and Series RLC circuit, Series resonance, Resonance curve, Bandwidth, Q-factor.	
2		**Simple Circuits**	**15**
	2.1	Series parallel combinations of resistors, capacitors and inductors and its verification through Hands on exercise,	
	2.2	Series and parallel combination of electrical sources (cell or battery) and its verification	
	2.3	Delta- Star and star –delta transformations and its verification for resistors.	
3		**AC Circuits**	**15**
	3.1	Filter circuits, RC Circuit and frequency response	
	3.2	low pass filter, high pass filter, cut off frequency	
	3.3	RL Circuit, RL low pass, high pass filter cutoff frequency.	
	3.4	LCR bandpass filter, its bandwidth, LCR band reject filter and its bandwidth	
4		**Clipper, Clamper and amplifier circuits**	**15**
	4.1	Voltage clipper, clamper circuit	
	4.2	designing of clipper and clamper circuit to clip or clamp the given waveform at particular voltage	
	4.3	Designing of single stage CE amplifier.	
		Total	**60**

Recommended Books:

1. Basic Electronics Solid State, Multicolour edition, B. L. Theraja, S. Chand &Company, New Delhi
2. Electronic Principle by Albert Malvino, David J. Bates, 7th Edition, TMH, 2007.
3. Grob's Basic Electronics by Mitchel E. Schultz, 10th Edition, TMH, New Delhi
4. Handbook of Electronics by Gupta, Kumar Part –I 44th Edn, 2017, Pragati Prakashan, Meerut
5. Electronic Devices and Circuits, by David A Bell Fifth Edition, Oxford University Press.

Guidelines for the Course Assessment:

A. Continuous Assessment (CA) (20% of the Maximum Marks) of theory and practical courses:

i. **For Theory Course:** CA shall form 20% of the Maximum Marks and shall be carried out over the entire semester. It shall be done by conducting **Two Tests** (Test I on 40% curriculum) and **Test II** (on remaining 40% syllabus) and average of the marks scored by a student in these two tests of a particular paper shall be taken as the **CA** score.

ii. **For Practical Course:** CA score of the practical course shall be marks scored by a student in the internal practical examination conducted by the concerned teacher.

B. End Semester Assessment (80% of the Maximum Marks) of theory and practical courses:

(For illustration a paper of 02 credits, 50 marks has been considered and shall be modified appropriately depending upon credits of the individual paper)

Question Paper Pattern of the ESA:

i. **ESA Question paper shall consist 6 questions, each of 10 marks**
ii. **Question No.1 shall be compulsory and shall be based on the entire syllabus**
iii. Students shall have to solve ***ANY THREE*** of the remaining Five Questions (i.e. from question 2 to 6)
iv. **Students shall have to solve a TOTAL of 4 Questions.**

C. Assessment of On Job Training (OJT) Course (for 04 credits):

a. Continuous assessment part (**40%, 40 marks out of 100**) of this course shall be done by the mentor of the student, where he /she is supposed to complete his On Job Training. This shall be based on the regularity, participation and performance of the students at the place of OJT.

b. Semester End Assessment (ESA) (**60% of the total marks, 60 marks out of 100**) of this course shall be done by a panel of examiners in two parts

i. based on the work report submitted by the student (**50% i.e. 30 marks)** and

ii. **Remaining 50%** (30 marks) shall be based on his presentation and viva-voce on the work carried to be assessed by the panel of examiners. This assessment shall be done along with practical examinations of respective courses / subjects.

D. Assessment of Field Project (FP) and Research Project (RP) (e.g. for 02 credits)

a. Continuous assessment part (**40%, 20 marks out of 50**) of this course shall be done by the mentor of the student and shall be based on regularity, experimental work and performance of the student.

b. Semester End Assessment (ESA) (**60% of the total marks, 30 marks out of 50**) of this course shall be done shall be done by a panel of examiners in two parts

i. based on the work report submitted by the student (**50% i.e. 30 marks)** and

ii. **Remaining 50%** (30 marks) shall be based on his presentation and viva-voce on the work carried out by the student. This assessment shall be done along with practical examinations of the respective courses / subjects.

E. Assessment of Co-Curricular courses (CCC):

a. Assessment of the CCC course shall be done by the respective course coordinator as a part of CA and be based on the regularity, performance of a student and his participation in various activities as prescribed in the regulations prepared in this regard.

b. The End Semester Assessment (ESA) of the CCC courses shall be done as per the regulations prepared in this regard and shall be done on the basis of the write-up, presentation by the student on the activities that he has carried out in a semester.

c. Students shall have freedom to opt for more than one CCC courses. However, score of the best performing CC shall be considered for preparing his result.

F. Syllabi, Teaching and Examination Scheme for the courses in Column 7 and Column 8 (AEC, VEC, IKS, CI, EVS, CCCs, etc.) shall be common for all the students from different faculties.

Note: Number of lectures required to cover syllabus of a course depends on the number of credits assigned to a particular course. One credit of theory corresponds to 15 Hours lecturing and for practical course one credit corresponds to 30 Hours. For example, for a course of two credits 30 lectures of one hour duration are assigned, while that for a three credit course 45 lectures.

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