

Dr. Sambhaji V. Patil

B. Sc., Ph. D.

PRINCIPAL



Maratha Vidya Prasarak Samaj's

ARTS, SCIENCE & COMMERCE COLLEGE

Ozar (Mig), Tal : Niphad, Dist : Nashik (Maharashtra) 422 206

Ph. : (02550) 275219, 206019

Fax : (02550) 275219

Website : www.ozarcollege.com

E-mail : ozarcollege@gmail.com

Affiliated to Savitribai Phule Pune University (ID No PUINS/ASC/027/1984)

Junior College Code : J 13.08.016

Junior Vocational College Code : J 13.08.907

NAAC Accredited B Grade (CGPA : 2.66)

Ref. No. 503/8018/L3

Date: 17-09-2018

To,
The Deputy Registrar,
Academic Section,
Savitribai Phule Pune University,
Ganeshkhind, Pune-07

Subject: Submission of B.Voc. Syllabus (Annexure-II) for approval

Sir,

We have been approved B.Voc. in "Electrical Technology" from UGC, New Delhi. Herewith we have submitted the syllabus in Annexure-II for your approval in the subject "Electrical Technology" to be run from the academic year 2018-19. We request you to give approval for "Electrical Technology" syllabus.

Thank you.

Sincerely yours

Dr. Sambhaji V. Patil
Principal

- Encl: 1. UGC approval letter
2. Annexure-II
3. Soft copy (CD)



o/c



शैक्षणिक विभाग, (मान्यता कक्ष)
गणेशखिड, पुणे-४११ ००७
दूरध्वनी क्र.: ०२०-२५६०५२५८/५८
ई-मेल : boards@puniversity.ac.in
वेबसाइट : www.unipune.ac.in

सावित्रीबाई फुले पुणे विद्यापीठ
(पूर्वीचे पुणे विद्यापीठ)
Savitribai Phule Pune University
(Formerly University of Pune)

Academic Section
(Approval Cell)
Ganeshkhedi, Pune-411 007
Phone: 020-25601257/58
E-mail: boards@puniversity.ac.in
Website: www.unipune.ac.in

संदर्भ क्र.:सी.बी.एस./८३०

दिनांक: २७.११.२०२१

परिपत्रक क्र. ३५९/२०२१

विषय :- विद्यापीठ अनुदान आयोगाच्या N.S.Q.F. योजनेतर्गत विज्ञान व तंत्रज्ञान विद्याशाखेतर्गत विविध महाविद्यालयांच्या B.Voc./ Community College च्या प्रमाणपत्र/ पदवीका/ पदवी/ अभ्यासक्रमांस पुढे दर्शविलेल्या शैक्षणिक वर्षापासून मान्यता देणेबाबत....

विद्यापीठ अधिकार मंडळाने घेतलेल्या निर्णयानुसार सर्व संघवितांस या परिपत्रकाद्वारे कळविण्यात येते की, विद्यापीठ अनुदान आयोगाच्या N.S.Q.F. योजनेतर्गत विज्ञान व तंत्रज्ञान विद्याशाखेतर्गत विविध महाविद्यालयांच्या B.Voc./ Community College च्या प्रमाणपत्र/ पदवीका/ पदवी अभ्यासक्रमांस पुढे दर्शविलेल्या शैक्षणिक वर्षापासून मान्यता देण्यात येत आहे.

Sr. No.	College Name	Course Name	Fresh Remarks
1	ACS College, CIDCO, Nashik	1. B.Voc. (Electrical Appliances Maintenance and Repairing)	F.Y.,S.Y. & T.Y. B.Voc. Syllabus approved from A.Y. 2020-21 for
2	AKI's Poona College of ACS, Pune	B.Voc. (Software Development)	F.Y.,S.Y. & T.Y. B.Voc. Syllabus approved from A.Y. 2020-21
3	Arts, Science & Comm. College, Nampur, Nashik	B.Voc. (Software Development)	F.Y.,S.Y. & T.Y. B.Voc. Syllabus approved from A.Y. 2020-21
4	Anantnagar Pawar College, Pirangut, Pune	B.Voc. (Multimedia & Animation) (Revised)	F.Y.,S.Y. & T.Y. B.Voc. Syllabus approved from

B. Voc
१२/१२

Arts, Science and Comm
College, Ozar (Mig)
Inward No. 483/2021-22
Date: 2-11-2021

27/11/2021

			A.Y. 2020-21
5	Dadasaheb Bhalke Arts, Science & Commerce College, Path, Nashik	Certificate Course in Information Technology (Community College)	Approved from Academic Year 2019-20 Certificate Course in Information Technology (Community College)
6	Mamasahab Mohol College, Arts, Commerce and Science, Yashwantrao, Paud Road, Pune-411038	B.Voc. (Software Development)	F.Y., S.Y. & T.Y. B.Voc. Syllabus Approved from A.Y. 2020-21
7	Arts, Science and Commerce College, Ozar (Mig), Nashik-422206	B.Voc. (Electrical Technology)	F.Y., S.Y. & T.Y. B.Voc. Syllabus approved from A.Y. 2020-21
8	Loknete Vyankatrao Hiray Arts, Commerce and Science College, Panchwati, Nashik	B.Voc. (Automobile Technology)	F.Y., S.Y. & T.Y. B.Voc. Syllabus approved from A.Y. 2020-21
9	Mul Education Society's, Arts Commerce & Science College, Sonai, Tal. Newasa, Dist. Ahmednagar-414 105	B.Voc. Food Processing	T.Y. Syllabus Approved (From A.Y. 2020-21)
10	Dr. D.Y. Paul Arts, Commerce and Science College, Pimpri, Pune-411018	Instrumental Techniques in Chemistry	Syllabus Approved (From 2020-21)
11	Agricultural Development Trust's, Shirdanagar, Sharfabi Pawar Mahila Arts, Commerce & Science College, Shirdanagar, Baranati-413 115.	1. B.Voc. (Food Processing) 2. B.Voc. (Dairy Technology)	F.Y. Syllabus Approved (From A.Y. 2020-21) F.Y. Syllabus Approved (From A.Y. 2020-21)
12	Amasabab Awate College, Manchar, Ambegaon, Pune-410503	B.Voc. (Food Processing and Quality Management)	F.Y., S.Y. & T.Y. B.Voc. Syllabus Approved (from A.Y. 2019-20)
13	Arts, Science and Commerce college, CIDCO, Nashik	a. Diploma in Sericulture b. Diploma in Medical Laboratory Technology c. Diploma in Sustainable Agriculture	Approved from A.Y.2020-21 Approved from A.Y.2020-21 Approved from A.Y.2020-21

Handwritten signature



उच्च शिक्षण विभाग

www.ugc.ac.in

Ph. No. 011-23604284



संघीय प्रभुत्व

विश्वविद्यालय अनुदान आयोग
(मानव संसाधन विकास मंत्रालय, भारत सरकार)
बहादुरशाह जफर मार्ग, नई दिल्ली - 110 002

University Grants Commission

(Ministry of Human Resource Development, Govt. of India)
Bahadurshah Zafar Marg, New Delhi - 110 002

No. F. 4-83/2018(NSQF)

1st August, 2018

The Principal
Maratha Vidya Prasarak Samaj's
Arts, Science & Commerce College
Tal. Niphad
Dist. Nashik
Maharashtra - 422 206

Subject: Approval of programmes/courses under NSQF

Dear Sir/Madam,

This is with reference to your proposal for introducing vocational courses under NSQF. I am directed to convey approval of the UGC for the following programmes/courses to be run by your institution under NSQF from the academic session 2018-19.


B. Voc.

- Electrical Technology
- Automobile

It is further informed that the institution may admit 50 students per course, and appoint faculty and staff as per the provisions of the NSQF Guidelines.

You are requested to kindly ensure compliance of the terms and conditions/provisions as laid down in the Guidelines for providing Skill-based Education under National Skill Qualification Framework. You are also requested to convey your confirmation to start the course/s from the academic session 2018-19 along with the course-wise actual intake of students to UGC at the earliest.

Yours faithfully,


(Mriganka Sekhar Sarma)
Education Officer

4/9/2018

SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE



Syllabus

For

B.Voc. (Electrical)

Electrical Technology

BACHELOR OF VOCATION (B.Voc.)

To be implemented from Academic Year 2018-2019 onwards



Maratha Vidya Prasarak Samaj's
ARTS, SCIENCE & COMMERCE
COLLEGE,
Ozar (mig), Dist-Nashik-422210

Department:
B.VOC. Electrical Technology

Annexure II

- 1. Title of the Course:** Electrical Technology
- 2. Course Level:** The certification levels shall lead to Diploma/Advanced Diploma/ B.Voc Degree in Electrical Technology

Award	Duration	Corresponding NSQF level
Diploma in Electrical Technology	1 Year	5
Advanced Diploma in Electrical Technology	2 Year	6
B. Voc. Degree in Electrical Technology	3 Year	7

COMMON COURSE STRUCTURE AND CREDIT DISTRIBUTION

Table:2 Credit

- 3. Syllabus to be implemented from Academic Year:** 2018-19 onwards.
- 4. Preamble of the Syllabus:** Arts, Science and Commerce College Ozar(mig),Dist- Nashik is offering a three year Bachelor Program in Vocational Education (B. Voc.) in **Electrical Technology** from academic year 2018-19. The curriculum design of this program is undertaken in the following framework (Preamble) as per the UGC guidelines for providing skill based education under National Skill Qualification framework (NSQF).

In the age of modernization and increased unemployment there is huge demand for skilled workers in electrical field. This has opened a great avenue and career options for the students. Generating power stations, various Industries, Government agencies (like Mahagenco, Mahatransco, Mahadiscom), Hospitals, Commercial Complexes, educational and research institutions need the expertise of people holding advanced degree in Electrical Technology. An electrical repair and maintenance worker (i.e. wireman, electrician, Technician, supervisor) is typically required to earn an associate degree or complete a formal training program before earning employment. Government of India (Union Power Ministry) established (Electrical Hub) Central Power Research Institute (CPRI) in around 100 acres at Shilapur, 15 Km away from Nashik. In present scenario, there is also need to develop Entrepreneurship among the students. Electrical Technology has wide application in Domestic, Commercial and Industrial sector.

5. Faculty of the Course:

For B. Voc. degree program - One Asst. Professor per course for three years (purely on contractual basis), visiting and guest faculty as per requirement

6. Eligibility for Admission:

As the CBSE and many other school boards are initiating skill based vocational courses with certification at NSQF Level 3 & 4 for students completing 10+2, there may be three types of learners getting admission to first semester of skill based courses under NSQF:

Category–1 : students already acquired NSQF certification Level 4 in a particular industry sector and opted admission in the skill based courses under NSQF in the institutions recognized under Community Colleges / B.Voc Degree programme / Deen Dayal Upadhyay KAUSHAL Kendras in same trade with job role for which he /she was previously certified at school level.

Category–2: students who have acquired NSQF certification Level 4 but may like to change their trade and may enter into skill based courses in a different trade.

Category–3: students passed 10+2 examination with conventional schooling without any background of vocational training.

7. Duration of the Course:

Course	Duration
Diploma in Electrical Technology	1 Year
Advanced Diploma in Electrical Technology	2 Year
B. Voc. Degree in Electrical Technology	3 Year

8. Intake Capacity of Students: 50 Students per year

9. Examination:

I. Pattern of Examination

i. Internal exam, Term end exam, Practical, Oral, Project.

A. General component:

- i. There shall be comprehensive In-semester examination for 50% marks for each paper (evaluation based Mid-term test, Oral, Tutorial, Assignment, Seminar presentation)
- ii. There shall be End-semester examination for 50% marks for each paper.

B. Skill component:

- i. There shall be comprehensive In-semester examination for 50% marks for each paper
- ii. There shall be End-semester examination for 50% marks for each paper.
- iii. The industrial training work shall be comprehensive In-semester evaluation for 75 marks and End-semester evaluation for 300 marks.

ii. Pattern of the question paper: As per University rules

II. Standard of Passing:

Student has to obtain 40% marks in the combined examination of In-Semester and End-Semester assessment with minimum passing of 30% passing in both assessments separately.

No. of Credits	Internal Marks Total	External Marks Total	Total Marks	Internal Passing Marks (Min.30%)	External Passing Marks (Min.30%)	Total Passing Marks (Min.40%)

3	35	40	75	11	12	30
4	50	50	100	15	15	40
6	75	75	150	23	23	60
8	75	125	200	23	38	80
10	75	175	250	23	53	100

III. ATKT Rules:

A student cannot register for third semester if she/he fails to complete the 50% credits of the total credits expected to be ordinarily completed within two semesters.

To qualify for admission to 5th semester (3rd year) of the course, the candidate must have passed 1st year and completed 50% credits of the 3rd and 4th semester (2nd year).

IV. Award of Class:

Grades will be awarded from grade point average (GPA) of the credits.

Marks/Grade/Grade Point (10 Point Scale)

Marks	Grade	Grade point
80-100	O: Outstanding	10
70-79	A+: Excellent	9
60-69	A: Very Good	8
55-59	B+: Good	7
50-54	B: Above Average	6
45-49	C: Average	5
40-44	P: Pass	4
0-39	F: Fail	0
-	Ab: Absent	0

Final Grade (10 Point Scale)

Grade Point Average	Grade
9.00 – 10.00	O
8.50 – 8.99	A+
7.50 – 8.49	A
6.50 – 7.49	B+
5.50 – 6.49	B
4.25 – 5.49	C
4.00 – 4.24	P
0.00 – 3.99	F

Remark- B+ is equivalent to 55% marks and B is equivalent to 50% marks.

Computation of SGPA and CGPA

Credit Point (CP) = Credit (C) × Grade Point (G)

$$\text{SGPA (S}_i\text{)} = \frac{\sum (\text{C}_i \times \text{G}_i)}{\sum \text{C}_i}$$

SGPA = Semester Grade Point Average

C_i = Number of Credit of the ith course component

G_i = Grade Points scored by the student in the ith course component

CGPA= Cumulative Grade Point Average

$$CGPA = \frac{\sum (C_i \times S_i)}{\sum C_i}$$

S_i = SGPA of the i^{th} Semester

C_i = Number of credits in that semester

$$\text{Grade Point Average} = \frac{\text{Total of Grade Point Earned} \times \text{Credit hrs for each Course}}{\text{Total Credit Hours}}$$

V. External students: Not applicable as this is a practical oriented course.

VI. Setting of Question Paper/Pattern of Question Paper:

Question Number	Type	Sub questions		Marks
Q.1	Short answer	10	No internal options	20
Q.2	Long answer	4	Any two out of four	10
Q.3	Long answer	4	Any two out of four	10
Q.4	Long answer	3	Any two out of three	10

VII. Verification/Revaluation: There is also a provision for verification and revaluation.

In case of verification, the existing rules of SP Pune University, Pune will be applicable.

The revaluation result will be adopted if there is a change of at least 10% marks and in the grade of the course. There shall be revaluation of answer script of end semester examination, but not of internal assessment papers.

10. Structure of the Course:**First Year**

Semester I		Semester II	
Paper Code	Title of the Paper	Paper Code	Title
BVET11	Communication Skill	BVET21	Applied Mathematics
BVET12	Basic Electrical Engg-I	BVET22	Electrical Appliances-I
BVET13	Basic Electrical Engg-II	BVET23	Electrical Machines-I
BVET14	Lab Practical-1 (Based on BVET12)	BVET24	Lab Practical-1 (Based on BVET22)
BVET15	Lab Practical-2 (Based on BVET13)	BVET25	Lab Practical-2 (Based on BVET23)
BVET16	Lab Practical-3 (Based on Elect Wiring)	BVET26	Lab Practical- (Based on Rewinding)

Second Year

Semester III		Semester IV	
Paper Code	Title of the Paper	Paper Code	Title
BVET31	Computer Technology	BVET40	Environment Awareness
BVET32	Electrical Appliances-II	BVET41	Entrepreneurship and Employable
BVET33	Electrical Machines-II	BVET42	Basic Electronics

BVET34	Lab Practical-1(Based on BVET31)	BVET43	Electrical Measurement
BVET35	Lab Practical-2(Based on BVET32)	BVET44	Lab Practical-1(Based on BVET42)
BVET36	Lab Practical-3(Based on BVET33)	BVET45	Lab Practical-2(Based on BVET43)
		BVET46	Lab Practical-3(Based on Motor Pump)

Third Year

Semester V		Semester VI	
Paper Code	Title of the Paper	Paper Code	Title
BVET51	Install., Testing and maintenance of Electrical Equipment	BVET61	Utilization of Electrical Energy & Electrical Audit
BVET52	Generation and transmission and Switchgear	BVET62	New Trends in Electrical Engineering and Technology
BVET53	Power Electronics & Drives	BVET63	Advanced Electrical Appliances
BVET54	Lab Practical-1(Based on BVET51)	BVET64	Industrial Training
BVET55	Lab Practical-2(Based on BVET52)	BVET65	Project
BVET56	Lab Practical-3(Based on BVET53)		

I. Compulsory Paper: All papers are compulsory

II. Optional Paper: Not applicable

III. Question Paper and Paper: As mentioned above

IV. Medium of Instructions: English

11. Equivalence of previous syllabus along with propose syllabus: Not applicable

12. University Terms: 6 terms

13. Subject wise Detailed Syllabus: Attached with this format

14. Recommended Books: Given at the end of syllabus

15. Qualification of Teacher: As per UGC regulations

Syllabus: B.Voc. : Electrical Technology
COURSE STRUCTURE

First Year (Diploma in Electrical Technology)						
Semester	Paper Code	Title of the Paper	Credits			Marks
			Total	Theory	Practical	
I	BVET11	Communication Skill	4	4	-	100
	BVET12	Basic Electrical Engg-I	4	4	-	100
	BVET13	Basic Electrical Engg-II	4	4	-	100
	BVET14	Lab Practical-1 (Based on BVET12)	6	-	6	150
	BVET15	Lab Practical-2 (Based on BVET13)	6	-	6	150
	BVET16	Lab Practical-3 (Based on Electrical Wiring)	6	-	6	150
Total Credits			30	12	18	750
Semester	Paper Code	Title	Credits			Marks
			Total	Theory	Practical	
II	BVET21	Applied Mathematics	4	4	-	100
	BVET22	Electrical Appliances-I	4	4	-	100
	BVET23	Electrical Machines-I	4	4	-	100
	BVET24	Lab Practical-1 (Based on BVET22)	6	-	6	150
	BVET25	Lab Practical-2 (Based on BVET23)	6	-	6	150
	BVET26	Lab Practical-(Based on Rewinding Motors)	6	-	6	150
Total Credits			30	12	18	750

Second Year (Advanced Diploma in Electrical Technology)						
Semester	Paper Code	Title of the Paper	Credits			Marks
			Total	Theory	Practical	
III	BVET31	Computer Technology	4	4	-	100
	BVET32	Electrical Appliances-II	4	4	-	100
	BVET33	Electrical Machines-II	4	4	-	100
	BVET34	Lab Practical-1 (Based on BVET31)	6	-	6	150
	BVET35	Lab Practical-2 (Based on BVET32)	6	-	6	150
	BVET36	Lab Practical-3 (Based on BVET33)	6	-	6	150
Total Credits			30	12	18	750
Semester	Paper Code	Title	Credits			Marks
			Total	Theory	Practical	
IV	BVET40	Environment Awareness	Grade			
	BVET41	Entrepreneurship and Employable Skill	4	4	-	100
	BVET42	Basic Electronics	4	4	-	100
	BVET43	Electrical Measurement	4	4	-	100
	BVET44	Lab Practical-1 (Based on BVET42)	6	-	6	150
	BVET45	Lab Practical-2 (Based on BVET43)	6	-	6	150
	BVET46	Lab Practical-3 (Based on Motor Pump and starters)	6	-	6	150
Total Credits			30	12	18	750

Third Year (Degree in Electrical Technology)						
Semester	Paper Code	Title of the Paper	Credits			Marks
			Total	Theory	Practical	
V	BVET51	Installation, Testing and maintenance of Electrical Equipment	4	4	-	100
	BVET52	Generation and transmission and Switchgear	4	4	-	100
	BVET53	Power Electronics & Drives	4	4	-	100
	BVET54	Lab Practical-1 (Based on BVET51)	6	-	6	150
	BVET55	Lab Practical-2 (Based on BVET52)	6	-	6	150
	BVET56	Lab Practical-3 (Based on BVET53)	6	-	6	150
Total Credits			30	12	18	750
Semester	Paper Code	Title	Credits			Marks
			Total	Theory	Practical	
VI	BVET61	Utilization of Electrical Energy & Electrical Audit	4	4	-	100
	BVET62	New Trends in Electrical Engineering and Technology	4	4	-	100
	BVET63	Advanced Electrical Appliances and Equipments	4	4	-	100
	BVET64	Industrial Training	10	--	10	250
	BVET65	Project	8	--	8	200
Total Credits			30	12	18	750

B.Voc (Electrical Technology)

Diploma in Electrical Technology

Syllabus

First Year : Semester –I

Paper Code : BVET11

Title: Communication Skills

Credit : 4

1. Formal Communication in Marathi (*ejkBh*):

१. प्रशानिक मराठी : प्रास्ताविका , अर्जलेखन, कार्यालयीन टिप्पणी लेखन, घोषणापत्र, निविदा. महितीपत्रक, निमंत्रणपत्रिका.
२. जाहिरात लेखन आणि जाहीर निवेदन: प्रास्ताविक, जाहिरात लेखन, जाहीर निवेदन, माध्यमे(लिखित, श्राव्य, द्रुकश्राव्य, जाहिरातीचा, आकृतिबंध प्रमाण भाषेचे लेखन.
३. व्यावहारिक संवाद कौशल्य: प्रस्तावना, व्याख्या, वैशिष्टे संवादाचे महत्व, विविध माध्यमांसाठी होणारे संवाद, संवादातील अडथळे, ई. मेल .

2. Office Correspondence: Meaning, Importance, Types, Drafting Memo (Memorandums), Orders, Circulars, Letters, Press Releases.

3. Business letters: Meaning, Importance, Qualities or Essentials, Physical

4. Appearance and Layout of Business Letters: Enquiry letters, Replies to Enquiry letters, Order letters, Credit and Status Enquiries, Sale Letters, Complaint letters.

5. Job Application Letter: Meaning, Types and Drafting of Job Application Letters, Resume / Curriculum Vitae.

Diploma in Electrical Technology

First Year : Semester –I

Paper Code: BVET12

Title: Basic Electrical Technology-I

Credit : 4

Units	Name of Unit	Content
I	Safety Precautions & Electrical symbols	Electrical shocks and procedure for separating, person from contact with live wire, First Aid, different methods of artificial respiration, Electric fire, Fire Extinguishers, Importance of Fuse and Earthing for safety. Precautions while working on HT/LT lines, Electrical symbols.
II	Current Electricity	Atomic Structure, Generation of electricity, Types of electricity, Effects of electric current , Different energy sources, EMF, potential difference, current, voltage, resistance, conductance, power, energy, Resistance Laws, specific resistance, energy billing for a month, direct current and alternating current
III	Measuring Instruments	Introduction, types of measuring instruments, analog and digital, Connection and use of ammeter, voltmeter, wattmeter, energymeter, multimeter, Ohm-meter, frequency meter, clip on meter, tachometer, megger, earth resistance tester
IV	DC circuits and Network Theorems	Ohm's law, Series circuit, Parallel circuit & series and parallel combination, types of electrical circuit. Electrical Network-Classification. Theorems-KCL, KVL, Superposition, Thevenin's, Norton's, Maximum power transfer theorem, Star-Delta Transformation
V	Electric cells and Capacitors	Electric cells and Battery, primary and secondary cells, i.e. Volta's cell, Daniel's cell, Dry cell, Lead acid cell, Nickel iron, Nickel cadmium, Lithium cell, Charging and discharging of Battery, series and parallel cells. Capacitors- Energy stored in capacitor, capacitance, charging and discharging of capacitor, Combination of capacitor, series and parallel of capacitor, Types of capacitors.

Diploma in Electrical Technology

First Year : Semester –I

Paper Code: BVET13

Title: Basic Electrical Engineering-II

Credits: 4

Units	Name of Unit	Content
I	Electromagnetism	Introduction, types of magnets, basic magnetisms, electromagnet, difference between permanent and electromagnet, magnetic rules, right hand rule, cork screw rule, end rule, Electromagnetic Induction, Faradays Laws, Fleming Rules, Induced emf-statically and dynamically, self and mutual induction, Force produced on current carrying conductor in magnetic field.
II	AC Fundamental	AC circuits- Introduction, Generation of AC single phase and 3 phase, star delta connection, Understanding of different term-Average, Peak, instantaneous and RMS Value, Peak , form factor, power factor, Phase, Phase Diff., lag and lead, Inductance, Capacitance, Impedance, Reactance-Inductive and Capacitive, True & Apparent power
III	AC circuit	Diff AC circuits, Pure R, Pure L and Pure C circuits, Graphical and Phasor representation, Series R-L, R-C and R-L-C circuits, Parallel R-L, R-C and R-L-C circuits, Resonance circuits, Disadvantages of low power factor, Causes of low power factor, Improvement of pf. R-Z triangle, Power triangle
IV	Illumination	Lamps, Types-Incandescent, Tube light, Neon Lamp, CFL, LED, Mercury Vapors, Sodium Vapors, Hallogen lamp, LED based modern lighting fixtures, Decorating lighting. Important terms of illumination. Direct and indirect lighting scheme
V	Electrical Material	Conducting & Insulating material. Fuse, Soldering and Magnetic Material. Importance of Fuse, Types, Fusing current, Fuse rating, Fuse Material, Soldering, Soldering Method/Procedure, Soldering Tools, Soldering material, Soldering Flux Magnetic Material-Ferro, Para, Die, Soft and hard magnetic material

Diploma in Electrical Technology

First Year : Semester –I

Paper Code: BVET14

Title: Lab Practical-1(Based on BVET12)

Credits: 6

Sr.No	Name of Practical
1	Demonstration of First Aid and Artificial respiration through video.
2	To remove person suffering from contact with live wire.
3	Study and use of Different types of Fire Extinguishers.
4	Drawing sheet on electrical symbol.
5	To Identify the alternating current (AC) and direct current. (DC)
6	To Study & Verify Resistance law.
7	To Study & Verify different effects of Electric current.
8	To Introduction of measuring instrument and their types.
9	To connect Ammeter, Voltmeter in the electrical circuit and measure the current & voltage.
10	To measure Resistance by V-I method, Multimeter method and Colour code method.
11	To measure the power by wattmeter method and V-I method.
12	To measure the energy by using single phase Energy meter and prepare one month electricity bill.
13	To Study & Verify ohm's law.
14	To Study and verify series and parallel Resistance circuit.
15	To Study and verify compound (series-parallel) Resistance circuit.
16	Verification of KCL & KVL for simple circuit.
17	Verification of temperature co-efficient of resistance.
18	Series & Parallel connection of cells.
19	Study the lead acid battery and measure the voltage & specific gravity of charge and discharge battery.
20	Study of series and parallel connection of capacitors.

Diploma in Electrical Technology

First Year : Semester –I

Paper Code: BVET15 Title: Lab Practical-2(Based on BVET13)

Credits: 6

Sr.No	Name of Practical
1	Verification of magnetic field of solenoid with air core and iron core.
2	Verification of torque development in current carrying conductor in magnetic field.
3	Verification of faraday's laws of Electromagnetic induction.
4	To Study & Observation of different magnetic rules.
5	To study Star and Delta circuit and calculate Voltage and current in line and phase.
6	To measure the RMS value and calculate the peak and Average value of AC.
7	To study & observe the self and mutually induced emf.
8	Study of R-L series and parallel circuit, calculation of Impedance & power factor. Draw vector diagram
9	Study of R-C series and parallel circuit, calculation of Impedance & power factor. Draw vector diagram
10	Draw R-Z diagram and power triangle.
11	Study of R- L-C series and parallel circuit, calculation of Impedance & power factor Draw vector diagram
12	To find relation between diameter of fuse wire and fusing current.
13	To study the operation of Fuse, MCB & ELCB
14	Soldering practice.
15	Study the different types of Lamp.
16	To Measure Illumination by luxmeter.
17	To Collect & Study Techo-commercial information of different lamps available in market (i. e. Lamp manufacture, technical specification, cost etc.)
18	Study the different lighting accessories required for various types of lamps.
19	Visit to nearby lamp manufacturing industry.
20	To Identify and rectify faults in lamps Fluorescent tube lights, Sodium/ Mercury vapour lamp and indoor outdoor LED lamps. (Any two)

Diploma in Electrical Technology

First Year : Semester –I

Paper Code: BVET16 Title: Lab Practical-3 (Electrical Wiring)

Credit: 6

Sr.No	Name of Practical
1	To Demonstrate types and use of various tools required for wiring installation/maintenance of electrical work.
2	To Demonstrate the use of safety devices and precaution while working on electrical installation
3	To study the all types of Electrical wiring accesories.
4	To study the all types of Electrical wiring .
5	To control one lamp by one way switch and two lamp and socket by Three one way switch.
6	To perform stair case wiring and Godown wiring.
7	To perform different type of Electrical wiring circuits.
8	To prepare and check the distribution switch board of minimum four point by using test lamp find the fault in electrical equipment.
9	To perform the coridoor (Varandha) wiring on demo-kit.
10	To perform the Hostel wiring on demo-kit.
11	To perform the Tunnel wiring on demo-kit.
12	To wire up the bell circuit and telephone point in casing caping wiring.
13	To trace the wiring daigram of any house and Estimate, costing & billing the wiring.
14	To test wiring of any house/ shop with help of Megger (Insulation Tester)
15	To wire up the dish antenna and intercom in casing caping wiring.
16	To wire up the CCTV in casing caping wiring.
17	To wire up the Three phase motor with DOL Starter in conduit wiring.
18	To Collect & Study Techo-commercial information of different wiring material available in market.
19	To visit the Shop/ Bunglow/ Building/ House where concealed wiring is in progress.
20	Design electrical installation scheme for Flat/Independent bunglow / House: and Draw Installation plan, single line diagram & wiring diagram. Prepare material schedule, detailed estimate & costing.

Diploma in Electrical Technology

First Year : Semester –II

Paper Code: BVET21

Title: Applied Mathematics

Credits: 4

1. **Logic:**
 - Introduction
 - Application of Logic
 - Application of Logic to switching circuit
2. **Complex Numbers**
 - Definition
 - Algebra of Complex number
 - Modulus and Argument
3. **Angles and its Measurements**
 - Trigonometric Functions
 - Introduction Graphs for Trigonometric Functions
4. **Linear Equations**
 - Linear Equation in one and two variable
 - Solution system of Linear equation
5. **Limit**
 - Algebra of Limits
 - Limit of trigonometric function
6. **Derivatives**
 - Derivative of standard Function
 - Rules of Differentiation
 - Maxima, Minima, Approximation
 - Application of Derivatives
7. **Integration**
 - Definition, Integral of some standard function
 - Integration Rules
8. **Differential Equations**
 - Ordinary Differential Equation
 - Order & Degree of Differential Equation
 - Solution of Differential Equation
9. **Menstruation** Find Area and Volume

Diploma in Electrical Technology

First Year : Semester –II

Paper Code: BVET22

Title: Electrical Appliances-I

Credits: 4

Units	Name of Unit	Content
I	Tools and Basic Testing Equipments	Testing Equipments-Neon tester, electronic line tester, series test lamp for single phase, parallel test lamp for single phase, series test lamp for three phase, parallel test lamp for 3phase, multimeter, thermostat, bimetallic relay, electromagnetic relay , thermocouple, overload switch
II	Electric Iron	Electric iron, types of electric iron (ordinary, automatic, steam, spray, laundry), their construction and Working, Testing, Possible faults/causes/Remedies, Precautions while using iron.
III	Room Heater & Toaster	Room Heater & Toaster- their construction and working, Testing, Possible faults /causes /Remedies.
IV	Electric Kettle and coffee percolator	Electric kettle, coffee percolator, their construction and working, Testing, Possible faults /causes /Remedies.
V	Electric Stoves	Stoves-Types, Open type (shegdi), closed type (hot plate), Simple oven, OTG, their construction and Working, Testing, Possible faults /causes /Remedies.
VI	Water Heaters	Immersion Heater and Geyser, their types, Their construction and Working, Testing, Possible faults /causes /Remedies, Precautions while using water heaters.
VII	Water Purifiers	Importance of Water purifier, Types- UV type, RO type, Their construction and Working, Testing, Possible faults /causes /Remedies. Maintenance & Cleaning Schedule.

Diploma in Electrical Technology

First Year : Semester –II

Paper Code: BVET23

Title: Electrical Machines-I

Credits: 4

Units	Name of Unit	Content
I	Single phase ac motors	Introduction and working principle, Constructional details, Classification of Motors Single phase motor self Starting methods Types- Split phase, Capacitor, Shaded pole, AC series, universal. Characteristics of split phase, Capacitor, shaded pole, AC series, universal type single phase induction motor and their applications.
II	Single phase transformers	Introduction, Working principle of transformer, Constructional parts and their functions. Materials used for construction. Classification of transformer. EMF equation of transformer, Transformation ratio, KVA capacity of transformer. Equivalent circuit diagram of transformer. Efficiency & Losses of transformer. Regulation of transformer. Method to find losses and efficiency and regulation of Transformer (OC & SC test). All day efficiency of 1phase transformer. Single phase Autotransformer. principle, advantages and disadvantages Instrument Transformer (CT & PT)
III	DC motors	Definition, Necessity of DC machines Construction of DC machine. Working principle of DC motor. Types of DC motor. Concept and significance of back emf. Torque expression, voltage equation, speed regulation, Characteristics & applications of DC motor, (shunt, series & compound), Speed control of DC Motor, Losses & Efficiency. types of armature windings, difference between Lap & Wave winding. Starters of DC motor-Necessity, Two, Three & Four point starter,
IV	DC generators	Working principle of DC generator, Types of DC generator. E. M. F. equation & voltage, equation of DC generator. Characteristics of DC generators, Armature reaction, Commutation, methods to improve commutation. Losses in DC generator, Applications of shunt, series and compound generator.
V	Special Purpose Motors	Working principle, construction and applications of Reluctance Motor, Hysteresis motor. Construction and Working of linear induction motor. Construction and Working of Brushless DC Motors, PMDC motors, printed circuit (Disc) motor, Stepper motor. Applications of them.

Diploma in Electrical Technology

First Year : Semester –II

Paper Code: BVET24 Title: Lab Practical-1(Based on BVET22)

Credits: 6

Sr.No	Name of Practical
1	Study of line tester, continuity tester, series and parallel test lamp .
2	Study of Thermostatic and Electromagnetic Relay.
3	To study and Measure temperature using Thermocouple.
4	Testing of domestic appliances by using series test lamp and multimeter.
5	Dismantling, fault finding, trouble shooting and reassembling of Electric iron.
6	Dismantling, fault finding, trouble shooting and reassembling of Room Heater.
7	Dismantling, fault finding, trouble shooting and reassembling of Toaster.
8	Dismantling, fault finding, trouble shooting and reassembling of Electric Kettle.
9	Dismantling, fault finding, trouble shooting and reassembling of coffee percolator
10	Dismantling, fault finding, trouble shooting and reassembling of Immersion Heater.
11	Dismantling, fault finding, trouble shooting and reassembling of Geysers.
12	Dismantling, fault finding, trouble shooting and reassembling of Electric stove.
13	Dismantling, fault finding, trouble shooting and reassembling of Heating oven.
14	Dismantling, fault finding, trouble shooting and reassembling of O.T.G (Oven, Toaster, Griller).
15	Dismantling, fault finding, trouble shooting and reassembling of Roti maker.
16	Dismantling, fault finding, trouble shooting and reassembling of Tandoor maker.
17	Dismantling, fault finding, trouble shooting and reassembling of Door Bell.
18	Dismantling, fault finding, trouble shooting and reassembling of Table Lamp.
19	Dismantling, fault finding, trouble shooting and reassembling of UV water purifier.
20	Dismantling, fault finding, trouble shooting and reassembling of RO water purifier.

Diploma in Electrical Technology

First Year : Semester –II

Paper Code: BVET25 Title: Lab Practical-2(Based on BVET23)

Credits: 6

Sr.No	Name of Practical
1	To test the capacitor and centrifugal switch of single phase motor.
2	To find the winding terminal of split phase motor by multimeter and series test lamp method.
3	To measure the starting & running current, voltage and speed of single phase split phase motor in both direction.
4	To measure the starting & running current, voltage and speed of single phase capacitor motor in both direction.
5	To trace out the field connection of shaded pole motor. Connect it on supply and measure the current, voltage and speed.
6	Dismantling, fault finding, trouble shooting and reassembling of given single phase motor and test it by using series test lamp & multimeter.
7	To measure the starting & running current, voltage and speed of single phase universal motor in both direction.
8	To find out the terminal of a two winding transformer and calculate transformation ratio.
9	To conduct open circuit and short circuit test on single phase transformer.
10	Determination the efficiency of single phase transformer.
11	Study the construction & working of Auto transformer.
12	To study and measure the current and voltage with CT & PT.
13	To study the construction of DC Machine.
14	Speed control of DC shunt motor above normal speed control method ii) Below normal speed control method
15	To reverse rotating directions of DC shunt motor & Compound Motor also measure the voltage, current and speed.
16	Load test on DC shunt motor & calculation of efficiency, output, torque etc.
17	To plot Load characteristic of DC generator.
18	Study the different types of DC Motor Starters.
19	To study the construction working of Stepper motor.
20	To study the working of Permanent Magnet DC motor (PMDC) & Printed circuit (Disc) DC motor.

Diploma in Electrical Technology

First Year : Semester –II

Paper Code: BVET26 Title: Lab Practical-3 (Rewinding of Electrical Motors)

Credits: 6

Sr.No	Name of Practical
1	To note down the external & internal data of motor and remove the burnt coil from stator slot.
2	To clean the slot and prepare slot insulation.
3	To make new coils as per old coil data by using appropriate former.
4	To make the developed winding diagram for given single phase motor.
5	Insert the coils in the stator as per diagram.
6	To make the winding connection of coils as per developed diagram of winding and insert the wedges in the stator slots.
7	Taping and Binding of Rewounded stator of motor.
8	Varnishing and Baking of Rewounded stator of motor.
9	Reassembling, testing and running of single phase rewounded motor.
10	To rewind burnt split phase motor.
11	To rewind capacitor motor (ceiling fan, table fan).
12	To rewind Shaded Pole motor (toy motor).
13	To rewind the field winding of mixer/grinder (universal motor).
14	To rewind the basket winding of 24 slots, 2 pole motor.
15	To rewind the concentric winding of 24 slot, 4 pole motor.
16	To replace the grinding blade, bush bearing, and carbon brushes of mixer & grinder (universal motor).
17	Testing and Balancing of rewounded armature or Rotor of single phase motor.
18	To Estimate, Costing & Billing of single phase motor.
19	To note down the data of small transformer and remove the burnt coil from core. To rewind the small transformer (230V/12V).
20	To visit the motor manufacturing industry or Rewinding Shop.