

**BRIEF REPORTS ON
CERTIFICATE COURSE IN REPAIR & MAINTENANCE OF POWER SUPPLY, INVERTER &
UPS under UGC COMMUNITY COLLEGE SCHEME**

1. **Name of the Course:** Certificate Course in Repair & Maintenance of Power Supply, Inverter & UPS (under Skill Development in Electronics System Design & Manufacturing Sector)
2. **Course Duration:** One semester (6 months)
3. **Credit:** This certificate course is Level 3 of NVEQF. It consists of three papers with 10 credits each (4 credits for theory, 6 credits for practical)

4. List of students enrolled:

- | | | |
|------------------------|-----------------------------|-----------------------------|
| 1. Vanlalnunpuia | 9. H.lalchhandami | 17. Lalruatsanga |
| 2. Vanlalchami | 10. Malsawmdawngi | 18. Laltlankima |
| 3. Laldinthara | 11. Vansangkimi | 19. Sougaijam Thasana Chanu |
| 4. H. Lalrinfela | 12. Joseph Lalngaihawma | 20. C.Remsangpuui |
| 5. C. Lallianzela | 13. Vanlalhriatrengi | 21. Angela Lallawmzuali |
| 6. Ramherliana | 14. David Paul Thanga | 22. Lalduhawma |
| 7. Lalvenkim Bawitlung | 15. B Vanlalhmangaihchhungi | |
| 8. Chanchal Kumari | 16. Lalrosanga | |

5. Curriculum: The course structured as approved is as follows –

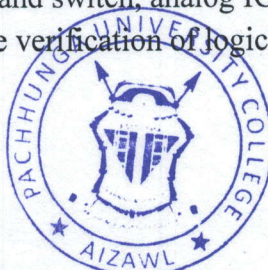
Semester	Course	Course No.	Credit	Continuous Assessment	End-semester Exam	Total	
I	Paper I	Course I- Theory	4	40	60	100	
		Course I -Practical	6	40	60	100	
	Paper II	Course I- Theory	4	40	60	100	
		Course II- Practical	6	40	60	100	
	Paper III	Course I- Theory	4	40	60	100	
		Course II- Practical	6	40	60	100	
	Total			30	240	360	600

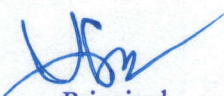
Detail syllabus of Theory papers:

PAPER I: INTRODUCTION TO ELECTRICITY, ELECTRONIC AND ELECTRICAL COMPONENTS

- Electric charge, voltage, electric current, Ohm's law, electric potential, cell.
- Series and Parallel Circuit, transformer – use and operation.
- Active and passive components, resistors, capacitors, inductors – their identification, types and applications, diodes – its type, characteristics and applications, transistors, integrated circuits.
- Study of transistor – uses as an amplifier and switch, analog ICs, 555 timer, IC741 – characteristics.
- Digital ICs, ICs for logic gates, truth table verification of logic gates.


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- Fuse types, uses and its rating, relays and switches, panel components, digital electronics – gates and its application, multiplexers, de-multiplexers, counter

PAPER 2: SOLDERING TECHNIQUES, TOOLS AND EQUIPMENT USE FOR REPAIRING AND MAINTENANCE, STABILIZERS AND CVT

- Soldering iron, wire, flux, soldering method, zero defect soldering, de-soldering pump, temperature controlled soldering station.
- Screw driver set, tweezers, different types of tweezers, nose pillars, wire cutter, hot air gun, liquid soldering pest, magnifying lamp, measuring tools, brush, CRO, nipper, multimeter operation.
- Need of stabilizer, working principle, type of stabilizer, autotap and automatic stabilizer, servo stabilizer, study of control circuit of stabilizer.
- Transformer employed in stabilizer, multi-winding/multi-tapped transformer, introduction to constant voltage transformer, general circuit diagram of CVT, working principle of CVT, EMI/RFI filter, Surge Suppressor, repairing of CVT.

PAPER 3: BASICS OF INVERTER AND UPS AND TROUBLESHOOTING TECHNIQUES

- Introduction to Inverter, Block diagram of inverter, rectifier, its type and working principle, filter employed in rectifier, battery charger circuit, working of inverter.
- Oscillator, type of oscillator, square wave generator, DC to AC Converter/ Inverter, designing an inverter, circuit using PWM UPS, working principle, specifications, explanation with the help of block diagram, UPS installation, finding of total load, selecting suitable inverter/UPS.
- Battery types, Primary cell, secondary cell, wet-charged, dry-charged, low maintenance, construction of battery, case cover plates, separator cells, electrolyte, etc., Lead acid battery, electrochemical reaction, Ni-CD battery, capacity rating, CCA, RC, AH & Power (watt), factor affecting charging, cause of battery failure, diagnosis and testing, visual, inspection, heavy load test.
- Basic troubleshooting method, getting into troubleshooting, selected instruments for troubleshooting, component testing methods, testing of components in circuits, logic steps of fault finding, troubleshooting through circuit diagram, removal and replacement of faulty component.

Detail syllabus of Practical papers:

PAPER –I

1. Verification of Ohm's law
2. Determination of diode and transistor characteristics
3. CE Amplifier circuit characteristics
4. Applications of IC741
5. Verification of logic gates

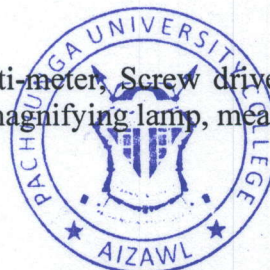
PAPER –II


1. Soldering and de-soldering of electronic circuits
2. CRO characteristics
3. Demonstration of uses of different functions in Multi-meter, Screw driver set, tweezers, nose pillars, wire cutter, hot air gun, liquid soldering pest, magnifying lamp, measuring tools, brush.
4. Repairing of stabilizers/ CVT

PAPER –III

1. Assembly/ Repair of UPS


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2. Diagnosis and load testing of different types of battery.
3. Various troubleshooting techniques for UPS and Power lines.

6. Examination and Assessment: Each paper shall be evaluated at the scale of 100. For all papers, irrespective of theory and practical, there shall be continuous internal assessment carrying 40 marks (40%) and an end-semester examination carrying 60 marks (60%).

a) Continuous Assessment (40 marks/paper):

The outline for continuous assessment activities shall be proposed by the teacher(s) concerned. There shall be series of tests at regular intervals as per schemes of awarding of marks below:

i) Scheme of awarding marks in Continuous Assessment in theory paper shall be as below:

- Best two of 2 Class Tests and Assignment/seminar/project = 30 Marks
- Attendance & Class Room performance = 10 Marks

TOTAL = 40

ii) Scheme of awarding marks in Continuous Assessment in practical paper shall be as given below:

- Best one of 2 hands on practical tests = 30 Marks
- Attendance & Class Room performance = 10 Marks

TOTAL = 40

b) End Semester Examination (60 marks/paper): There will be End Semester Examination at the end of every Semester. Each paper will carry 60 marks. Duration of exam will be - 3 hours in Theory per paper and 6 hours in Practical per paper.

i) Scheme of awarding marks in end Semester theory paper shall be as given below:

- Section A: Multiple choice - 10 Questions – 10x1 = 10 marks
- Section B: Short answer - 5 Questions – 5x4 = 20 marks
- Section C: Descriptive - 3 Questions – 3x10 = 30 marks

TOTAL = 60

ii) Scheme of awarding marks in end Semester Practical paper shall be as given below:

- Section A: Major experiment - 1 Question – 1x20 = 25 marks
- Section C: Minor experiment - 1 Question – 1x10 = 15 marks
- Section D: Viva voce = 10marks
- Section E: Practical Record/Field Report - = 5 marks

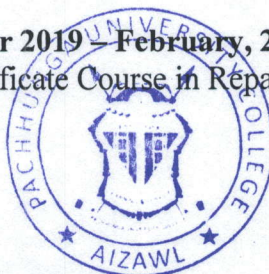
TOTAL = 60


A minimum of 30 Credits are required for awarding of the certificate.

- a) For passing of each course a candidate must secure a minimum of 50% marks (equivalent Grade 'B') in end semester examination. For internal assessment there shall be no passing marks. However, grading shall be based on marks obtained in both components i.e., continuous assessment and end semester examination.
- b) A student, who has not secured above marks has to reappear in end semester examination.
- c) In any case a student shall not be allowed to repeat a course for continuous assessment component.
- d) No candidate shall be allowed to appear any paper for more than three times (including the regular chance), and no candidate shall be allowed to appear in any course beyond three semesters of his/her first admission.

7. Summary report of the first batch (September 2019 – February, 2020): The first batch of students for UGC Community College Scheme funded Certificate Course in Repair & Maintenance of Power Supply,


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Inverter & UPS was admitted during August, 2019. Actual classes could start only in September, 2019. On usual working days (Monday to Friday), classes were conducted after 3:30 PM every day without disturbing the normal undergraduate classes in the college. Though admission was open for anyone with a minimum qualification of class X standard, only students of final year B.Sc. (Physics core) were admitted on the basis of first come, first served. In total 30 students took admission, but after few weeks 8 of them decided to discontinue the course as it was too much of a burden for them (in addition to their normal UG course). As per the requirement, 22 students were able to continue the course and classes were conducted till February, 2020 (6 months). All the classes were conducted in the facilities provided by the college – lecture hall and laboratory space. However, one instructor from nearby Industrial Training Institute, Mr. R. Lalengliana was able to render his service. His remuneration was also paid from the scheme. While students were hopeful of successfully completing the course by appearing in the final assessment, till today our institution could not find certified assessor from the relevant skill sector council to give assessment for the award of the certificate. It is very unfortunate that after repeated communication from our institution since February 2020, the skill sector council could not give positive response during this pandemic situation. Therefore, at this stage we are not in a position to report any successful completion of the course as we have not awarded any certificate yet.

COLLECTION OF PICTURES OF STUDENTS TAKING PART IN THE COURSE



(DR. LALHRIATZUALA)
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