J.S. University, Shikohabad

Established by UP Govt. Act No. 07 of 2015
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Value Added Course

[VAC-011]
UPS Invertor Repairing and Maintenance

Faculty of Engineering

Department of Electrical and Electronics Engineering

	J.S. University, Shikohabad Faculty of Engineering	Value Added Course
		AY: 2018-19

UPS, Invertor, Repairing and Maintenance [VAC-011]

Learning Objective:

This Course will provide knowledge of repairing and maintain UPS and invertors to the students.

Duration: 30 Hours. (Theory and Practical)

Course Outcomes: -

Maximum Exposure has to be given on Practical Oriented

After completion of the course the student shall be able to:-

1) Understanding of Electrical Hazards and Safety.
2) Evaluate the basic faults in UPS, Invertors
3) Diagnose the Basic faults in UPS and Invertors
4) Developed the ability to analysis Voltage regulator supply of UPS, Invertor
5) Developed the ability to repair and maintain basic faults occur in UPS and Invertors

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Syllabus Outline

1. **Module-1**

   Introduction to Electrical & Personal Safety

   Electrical hazards- Short Circuit, Loop, High Currents, and High Voltage. Personal Safety Do-Not to Do while working, basic safety equipment

2. **Module-2**

   Basic of Electricity

   Single Phase, Three Phase Power, AC, DC Power, Practical Measurements of Voltage, Current, Resistance using multimeter, Testing of Earth using test lamp, Fuses-Type, rating with applications

3. **Module-3**

   Electronic and Electrical Components of UPS, Invertors

   Basic Passive and Active components, testing, MOSFET applications- Introduction and precautions when handling, Op-Amp- Applications, Voltage Regulators, DIAC, TRIAC, SCR and Logic gates ICs, Transformers, Relays, Fuses, SMPS, Load Limiter

4. **Module-4**

   Operation of UPS, Invertors

   Different types of Invertor, UPS- Single phase, Three Phase, Load wise suitability, Block Diagram, Basic Faults and diagnosis methods, Rectifying common faults, testing of major parts- Transformers, Relay, SMPS, ICs

5. **Module-5**

   Battery Maintenance

   Lead acid battery, Li-Ion battery, Charging and discharging of battery, Simulate load test on battery, faults related to battery and diagnosis.

References:

1. Basic Electronics - Repair & Maintenance of Power supply, Invertor & UPS – NIMI Published by National Instructional Media Institute, Chennai
2. Switching Power Supply Design, 3rd Ed. by Abraham Pressman (Author),
3. Uninterruptible Power Supplies Alexander King, William Knight McGraw Hill Professional
4. "UPS Maintenance and Repair: A Practical Guide" by Salman Abdul Moiz Khan (2018)
5. "Troubleshooting and Repairing Commercial Electrical Equipment" by David Herres (2018)
6. "Handbook of UPS: Maintenance and Troubleshooting" by Dennis L. Tucker (2017)
7. "Power Electronics Handbook: Devices, Circuits and Applications" by Muhammad H. Rashid (2017)
8. "Maintenance and Troubleshooting of Electronic Equipment" by Khandpur R.S. (2015)
9. "Troubleshooting and Repairing Major Appliances" by Eric Kleinert (2012)
10. "Advanced Control of AC / DC Power Networks: System of Systems Approach Based on Spatio-temporal Scales" by Lina Bertling Tjernberg (2011)

(Name of Faculty)	(Name of Faculty)	(Name of Faculty)
Course Coordinator	Dean Academics	Director/Principle/Dean of Faculty/Department
Dr. Saik Sadruh		Dr. Adnan Qamar