

IPS Academy, Institute of Engineering & Science, Indore
(A UGC Autonomous Institute, Affiliated to RGPV)

ESC 203	Electronics and Computer Workshop	0L:0T:2P (2 Hrs)	1 Credits
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Course Objective: The course objectives are to identify different electronic components, devices, making circuit on bread board and PCB using simple ICs and components and testing, to assemble Desktop and creating a LAN network for PCs.

(Part A) Electronics

Module I: (4 hrs.)

Identification of various electrical passive components such as R, C, L, transformers, relays, switches, bread board, universal printed circuit board and electronic devices such as rectifying diode, Zener diode, light emitting diode, transistor, seven segment displays, LCD panel, Integrated circuit chip (with different packages and functionalities, both digital and analog) and Surface mount devices/chips. Acquaintance with ratings, specifications, packages of components and devices listed above, using data-sheets.

Module II: (4 hrs.)

Exposure to usual electronic equipment/instruments such as Multi-meter, Oscilloscope; CRO, DSO, Function generator, IC tester and Power supply, Information about their front panels, Demonstrations on their working, Hands-on for measurement of component values and DC voltage using multi-meter.

Module III: (4 hrs.)

Circuit building practice on standard breadboard using digital ICs, components and single strand wires. Soldering and de-soldering practice on universal PCBs using solder guns/stations/de-soldering pumps, for components/devices/ICs.

Module IV: (4 hrs.)

Electronic circuit design in a team of 3-4 students, designing of single sided PCB, PCB fabrication process, component mounting and soldering.

Example of projects:

- IC 555 based timer and square wave generator
- OP-amp IC 741 based analog computer (adder/subtractor/integrator/differentiator)
- FM remote lock for vehicle
- Digital Clock
- Temperature sensor and display

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(Part B) Computer

Module I: (4 hrs.)

Name and identify various PC hardware components: USB Mouse, PS/2 Mouse, Keyboard, LCD/LED Monitor, VGA, HDMI, CAT5, CAT6, fiber cable, Hard disk, RAM, CMOS battery, SMPS, cache, ROM, BIOS

Module II: (4 hrs.)

Introduction to various important software: Windows, Microsoft Office; Firefox, Google Chrome, Edge; Understand the broad structure and functioning of the Internet; General introduction to Website and webserver. Understand basic networking commands, applications and services: SSH, TELNET, FTP, ping, http, https, and various search services (google, startpage, aggregator search services).

Module III: (2 hrs.)

Assemble a Desktop PC from its components, Installation of Windows, display settings, Introduction to: LAN, DNS, Proxy, Router, Hub, Switch, Server, Client, LAN Network creation.

Module IV: (4 hrs.)

Information and Communications Technology (ICT): Online Teaching and Learning platform; MS team, Google Meet, Zoom, Webex their applications, Video from ppt, MOOC platform: NPTEL, EDX, Coursera, Swayam, etc.

Course Outcomes:

Students earning credits will develop ability to:

1. Identify various electronic components and use of electronic devices and instruments.
2. Design and test simple electronic circuit on PCB.
3. Know hardware components of computer systems, various software and hardware terms and their uses.
4. Learn the setup of a working desktop and creating a LAN network for PCs.
5. Learn about ICT enable tools for Teaching and Learning.

Textbooks/References:

1. S. Salivahanan and N. Suresh Kumar, Electronic Devices and Circuits: second edition, Tata McGraw Hills, 2011.
2. Leach, Malvino, Saha, Digital Principles and Applications (SIE) | 8th Edition, McGraw Hill Education, 2014.
3. Behrouz A. Forouzan, data Communications and Networking (SIE) | 4th Edition, McGraw Hill Education.
4. www.mooc.org.
5. https://en.wikipedia.org/wiki/List_of_MOOC_providers.
6. <https://teambuilding.com/blog/virtual-meeting-platforms>.