

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
1st Year Curriculum Structure for B.Tech courses in Engineering & Technology
(Applicable from the academic session 2018-2019)

Course Code : ES-ME192/ ES-ME 292	Category : Engineering Science Courses
Course Title : Workshop/ Manufacturing Practices	Semester : First/ Second
L-T-P : 1-0-4	Credit:3
Pre-Requisites:	

(i) Lectures & videos:

Detailed contents:

1. Manufacturing Methods- casting, forming, machining, joining, advanced manufacturing methods
2. CNC machining, Additive manufacturing
3. Fitting operations & power tools
4. Electrical & Electronics
5. Carpentry
6. Plastic moulding, glass cutting
7. Metal casting
8. Welding (arc welding & gas welding), brazing

(ii) Workshop Practice:

- **Machine shop (8 hours)**

Typical jobs that may be made in this practice module:

- To make a pin from a mild steel rod in a lathe.
- To make rectangular and vee slot in a block of cast iron or mild steel in a shaping and / or milling machine.

- **Fitting shop (8 hours)**

Typical jobs that may be made in this practice module:

- To make a Gauge from MS plate.

- **Carpentry (8 hours)**

Typical jobs that may be made in this practice module:

- To make wooden joints and/or a pattern or like.

- **Welding shop (8 hours (Arc welding 4 hrs + gas welding 4 hrs))**

Typical jobs that may be made in this practice module:

- **ARC WELDING (4 hours):** To join two thick (approx 6mm) MS plates by manual metal arc welding.
- **GAS WELDING (4 hours):** To join two thin mild steel plates or sheets by gas welding.

- **Casting (8 hours)**

Typical jobs that may be made in this practice module:

- One/ two green sand moulds to prepare, and a casting be demonstrated.

- **Smithy (4 hours) ~ 4 hours**

Typical jobs that may be made in this practice module:

- A simple job of making a square rod from a round bar or like.

- **Plastic moulding & Glass cutting (4 hours)**

Typical jobs that may be made in this practice module:

- For plastic moulding, making at least one simple plastic component should be made.
- For glass cutting, three rectangular glass pieces may be cut to make a kaleidoscope using a black colour diamond cutter, or similar other components may be made.

- **Electrical & Electronics (8 hours)**

- Familiarization with LT switchgear elements, making its sketches and noting down its specification. Kitkat fuse, Glass cartridge fuse, Plastic fuse holders (optional), Iron clad isolators, MCB style isolators, Single phase MCB, Single-phase wire, wiring cable.
- Demonstration of domestic wiring involving two MCB, two piano key switches, one incandescent lamp, one LED lamp and plug point.
- Simple wiring exercise to be executed to understand the basic electrical circuit.
- Simple soldering exercises to be executed to understand the basic process of soldering.
- Fabrication of a single-phase full wave rectifier with a step down transformer using four diodes and electrolytic capacitor and to find its volt-ampere characteristics to understand basic electronic circuit fabrication.

Examinations could involve the actual fabrication of simple components, utilizing one or more of the techniques covered above.

Laboratory Outcomes

- Upon completion of this laboratory course, students will be able to fabricate components with their own hands.
- They will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes.
- By assembling different components, they will be able to produce small devices of their interest.

Learning Resources:

1. Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., “Elements of Workshop Technology”, Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
2. Kalpakjian S. and Steven S. Schmid, “Manufacturing Engineering and Technology”, 4th edition, Pearson Education India Edition, 2002.
3. Gowri P. Hariharan and A. Suresh Babu, “Manufacturing Technology – I” Pearson Education, 2008.
4. Roy A. Lindberg, “Processes and Materials of Manufacture”, 4th edition, Prentice Hall India, 1998.
5. Rao P.N., “Manufacturing Technology”, Vol. I and Vol. II, Tata McGrawHill House, 2017.