



## MECHANICAL & PRODUCTION ENGINEERING DEPARTMENT (MPE)

### WASTE MANAGEMENT AND RECYCLING GUIDELINES FOR MPE DEPARTMENT

#### 1. MECHANICS LAB AND MACHINE SHOP:

##### A. LATHE MACHINE, DRILLING MACHINE, MILLING MACHINE, SHAPING MACHINE, GRINDING MACHINE:

- Regularly inspect and maintain machines to reduce the generation of waste.
- Implement a tool reuse program to extend the lifespan of cutting tools.
- Collect metal shavings for recycling purposes.
- Properly dispose of used lubricants and coolants at designated recycling centers.

##### B. WELDING APPARATUS AND FABRICATION SECTION:

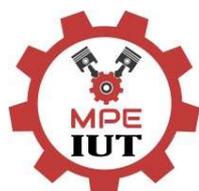
- Encourage the use of scrap metal from previous projects.
- Implement a scrap metal recycling program.
- Properly dispose of welding waste, such as slag and unused materials, according to local regulations.

##### C. CASTING SECTION:

- Promote the reuse of casting molds where possible.
- Collect and recycle excess casting materials.
- Dispose of casting sand and other waste in an environmentally friendly manner.



Figure 1 The Waste Framework Directive defines a hierarchy in waste management.



## 2. REFRIGERATION AND AIR CONDITIONING LAB:

- Regularly maintain equipment to extend its lifespan and reduce the need for replacements.
- Implement a refrigerant recovery program for old equipment.
- Recycle packaging materials from new equipment deliveries.
- Properly dispose of outdated or non-functional components.



Figure 2 7 steps in handling waste according to ISO 14001

## 3. FLUID MACHINERY LAB:

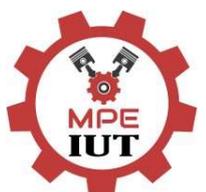
- Collect and recycle used fluids such as hydraulic oils and lubricants.
- Encourage the use of environmentally friendly hydraulic fluids.
- Properly dispose of worn-out or damaged machinery components according to regulations.

## 4. SIMULATION LAB:

- Promote the use of virtual simulations to minimize the need for physical materials.
- Recycle electronic waste generated from outdated computers or equipment.
- Dispose of obsolete simulation models in an environmentally responsible manner.

## 5. AUTOMOBILE LAB:

- Implement a used parts program for non-critical components.
- Properly dispose of hazardous materials, such as used oils and batteries, at designated recycling centers.
- Recycle metal and plastic components from decommissioned vehicles.



## 6. CEZERI LAB (3D PRINTING, LASER CUTTER, CNC DRILLING MACHINE, CNC LATHE MACHINE):

- Encourage the use of recycled or biodegradable filaments for 3D printing.
- Implement a filament reuse program for leftover or failed 3D prints.
- Collect and recycle materials used in laser cutting, such as acrylic and wood.
- Dispose of electronic waste from CNC machines responsibly through designated channels.
- Implement a regular maintenance schedule for 3D printers, laser cutters, and CNC machines to reduce the generation of faulty prints and waste.

## 7. RENEWABLE ENERGY LAB:

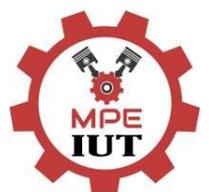
- Minimize paper usage through electronic documentation and communication.
- Recycle materials from lab experiments and prototypes.
- Properly dispose of batteries, solar panels, and other lab equipment at designated recycling centers.
- Implement energy-saving practices within the lab, such as turning off equipment when not in use.
- Explore the use of sustainable materials in lab experiments and projects.



Figure 3 The 3 R's of Solid Waste Management

## 8. OFFICE:

- Implement a paper reduction policy by encouraging electronic documentation.
- Set up designated bins for recycling paper, plastics, and other recyclables.
- Purchase office supplies in bulk to reduce packaging waste.
- Promote energy conservation measures, such as turning off lights and electronics when not in use.
- Minimize the use of single-use plastics in the office area.
- Encourage the use of reusable office supplies and containers.
- Implement a battery recycling program for used batteries from electronic devices.



- Establish clear guidelines for the proper disposal of electronic waste, including old computers, keyboards, and other office equipment.



*Figure 4 Segregation of waste with proper signage*

#### GENERAL GUIDELINES:

- Conduct regular training sessions for staff and students on waste reduction and recycling practices.
- Collaborate with local recycling facilities for the proper disposal of specific materials.
- Periodically review and update waste management policies to ensure relevance and effectiveness.
- Monitor and report on the department's waste reduction and recycling efforts to encourage continuous improvement.
- Create awareness campaigns to educate lab users on the importance of waste reduction and recycling.
- Display clear signage for waste disposal, indicating the types of materials suitable for recycling.
- Establish a feedback mechanism for lab users to suggest and implement additional waste reduction initiatives.

By implementing these guidelines, the MPE department at IUT can contribute to a more sustainable and environmentally friendly approach to waste management.

