

Program : Diploma in Engineering and Technology / Commercial Practice / Management	
Course Code : 4009	Course Title: Minor Project
Semester : 4	Credits: 2
Course Category: Minor Project	
Periods per week: 4 (L:0 T:0 P:4)	Periods per semester: 60

Course Objectives:

- To provide the students with a real-time learning experience.
- To expose students to industrial practices in housekeeping which are practiced as part of lean manufacturing.
- To encourage the students to undertake and solve issues of social significance applying technology, utilizing learning experience which they have acquired till the semester.

Course Prerequisites:

Topic	Course code	Course name	Semester
Fabrication skills		Engineering Workshop Practice	1, 2
Basics of relevant discipline		Basic Engineering courses.	2, 3
		Fundamentals of Electrical & Electronics Engineering	2
Environment impact of technology		Environmental Science	2
Soldering skill / knowledge on prototyping boards		Electronics Tinkering Workshop	2

Course Outcomes:

On completion of the course, the student will be able to:

CO _n	Description	Duration (Hours)	Cognitive level
CO1	Apply housekeeping standards as part of lean manufacturing for workplace maintenance.	21	Applying

CO2	Plan procedures for maintenance and preventive maintenance of equipment, tools, machineries, etc.	12	Applying
CO3	Choose methods for calibration of measuring and test equipment.	9	Applying
CO4	Employ skills acquired to solve problems of social significance or to simplifying day to day tasks.	18	Understanding

CO – PO Mapping

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO1	3				3	3	3
CO2	3				3		
CO3	3						
CO4					3		3

3 - Strongly mapped, 2 - Moderately mapped, 1 -Weakly mapped

Course Outline

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	Apply housekeeping standards as part of lean manufacturing for workplace maintenance.		
M1.01	Make use of 5S standardization procedures for workplace maintenance.	21	Applying
CO2	Plan procedures for maintenance and preventive maintenance of equipment, tools, machineries, etc.		
M2.01	Choose methods for preventive maintenance of machines and equipment.	3	Applying
M2.03	Identify systematic methods for repair and troubleshooting of machineries and equipment.	3	Applying
M2.04	Plan tools, procedures and technical manuals for setting and maintaining self-maintenance cell.	6	Applying
CO3	Choose methods for calibration of measuring and test equipment.		
M 3.01	Apply procedures for calibrating measuring and test instruments used in laboratory.	9	Applying

CO4	Make use of skills acquired to solve problems of social significance or to simplifying day to day tasks.		
M4.01	Identify problems of social significance or with day to day applications or to enhance the productivity of the process that can be solved, simplified or improved applying technology.	6	Applying
M4.02	Apply technology to solve the identified problem. (open ended project)	6	Applying
M4.03	Outline procedures used for solving the problem.	6	Understanding
	Total	60	

The course is organized in two phases

Phase1: Creating an industrial environment within the institute.

- a) 5S Implementation: Students trained in the industry practices such as workplace maintenance, safety, reduction of wastage, teamwork, and maintenance of tools and equipments. 5S standardization as part of lean manufacturing shall be followed. The entire workplace including laboratories, classrooms, faculty rooms, etc. shall be maintained under 5S.
- b) Maintenance and preventive maintenance of equipment, tools, machineries: Each department shall establish a Self Maintenance Cell (SMC) through which students shall be trained and encouraged to undertake maintenance and repairing of equipments, machines, tools, electrical wiring, etc.. The learning experience need not be program-specific but shall utilize course outcomes acquired through Engineering workshop practices. All activities performed should be strictly supervised for work safety, norms specified for the equipment in terms of electrical, structural, machine safeguarding and Electro Static Discharge (ESD) should be followed.
- c) Calibration of measuring and test equipments: Training and practicing procedures for calibration of meters and equipments shall be provided to students.

Phase2: Utilizing discipline knowledge acquired to solve real time problems of social, industrial or academic significance.

- a) Identify problems of social significance or with day to day applications: Students shall be provided with problems of social significance which can be solved applying skills acquired so far. Minor projects in the following domain may be undertaken
 1. Preventive Maintenance of machinery.
 2. Maintenance of UPS.
 3. Electrical wiring.
 4. Machine/equipment maintenance.
 5. Fabrication.
 6. Improvisation of tools.

7. Repairing.
8. Networking.
9. DTP.
10. Configuring software.
11. Solar installations.
12. Automotive maintenance.
13. Maintenance of building/infrastructure.
14. Furniture repair.
15. Maintenance of equipment public educational institutions, hospitals public offices.
16. Repairing and maintenance of public facilities.
17. Involvement in manufacturing activities of inhouse production center.

The list is not exhaustive; additions of activities of relevance are permitted. The minor project does not envisage problems involving extensive engineering designs but shall integrate available resources for solving any problem strictly adhering to the quality and safety standards. Only problems with social significance or day to day applications shall be selected as a minor project.

b) Apply technology to solve the identified problem:

Some Suggested open ended problems:

- Improvise tools used for agriculture to enhance efficiency.
- Organize hackathons to solve pre identified problems of social significance.
- Perform upgradation of computers available in the institution to reduce e waste.
- Implement proper methods for waste management.
- Choose methods for effective recycling of water.
- Perform timely maintenance of computer networks available in the campus.
- Study quality of portable drinking water available in the locality.
- Prepare estimate and supervise low cost housing projects for local community.
- Undertake collaborative projects pertaining to local self-government, Public Work Department, Health Department, Electricity board, Educational Institutions etc.
- Involvement in house production centers.

The list provided is only indicative, necessary inclusions in the list may be made.

Text / Reference

T/R	Book Title/Author
T1	Ade Asefeso, A A Global Sourcing Ltd, 5s for Supervisors
R1	José Luís Quesado Pinto, João Carlos O. Matias, Carina Pimentel, Susana Garrido Azevedo, Kannan Govindan, Springer Just in Time Factory: Implementation Through Lean Manufacturing Tools