

Government of Karnataka
Department of Technical Education
Board of Technical Examinations, Bangalore

	Course Title: PROFESSIONAL PRACTICES (Mechanical Stream)		
	Scheme (L:T:P) : 0:2:4	Total Contact Hours: 78	Course Code:15ME55P
	Type of Course: Assignment Group talk and practice	Credit : 03	Core/ Elective: Core(practice)
CIE- 25 Marks		SEE- 50 Marks	

Prerequisites: Enthusiasm to Explore New things by taking individual tasks and acquires skills from participating in group activities.

Course Objectives:

Professional development of Diploma engineering students is to be done by exposing them to various simulative situations in the industries. This is achieved by involving students in activities such as inviting experts from various industries for sharing their experiences, arranging industrial visits, seminars etc.

COURSE OUT COME

On successful completion of the course, the students will be able to:

Course Outcome		CL	Linked activity	Linked PO	Teaching Hrs
CO1	Search the information related to topic, and acquire knowledge of contemporary issues related to advancements in Mechanical engineering.	Analysis	1	2,8,9	15
CO2	Exposure to various industry environment practice and global, societal, economic, and/or environmental issues, by listening experts talks and interact with them	Application/ analysis	2	2,7,8,9	15
CO3	Discuss & disseminate about advancements in related profession including societal, environmental	Innovative /Analysis	3	7,8,9	15
CO4	Develop individual confidence and acquire life skills to handle various engineering assignments	Application	4	2,7,8	15
CO5	Enhancing the employability skills and to increase his ability to engage in, life-long learning, by undergoing industrial visits	Analysis /Creation	5	2,4,10	18
		Total			78



COURSE-PO ATTAINMENT MATRIX

Course	Programme Outcomes									
	1	2	3	4	5	6	7	8	9	10
PROFESSIONAL PRACTICES	0	3	0	1	0	0	2	3	2	1
Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed. Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO. If $\geq 40\%$ of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3 If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2 If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1 If $< 5\%$ of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.										

1. Information Search and Data collection:

15HRS

Information search can be done through manufacturer's catalogue, websites, magazines; books etc. *Following topics are suggested.*

1. Engine lubricants & additives
2. Automotive gaskets and sealants
3. Automobile automatic diagnostics
4. Engine coolants and additives
5. Two and Four wheeler carburettor.
6. Power steering
7. Filters
8. Different drives/Transmission systems in two wheelers.
9. Types of bearings – applications and suppliers.
10. Heat Exchangers
11. Maintenance procedure for solar equipment.
12. Tools holder on general purpose machines and drilling machines.
13. The student should search any relevant information of innovation principles should lead to selection of Project in Current semester.
14. Cutting tools
15. Additive manufacturing
16. Alternative materials for manufacturing
17. Composite materials
18. Nano materials
19. Welding in medical applications
20. Micro machining and fabrication
21. Advanced metal casting
22. Special purpose machines
23. Jigs and fixtures
24. Plant maintenance
25. Industrial safety
26. Fire fighting
27. Industrial Effluent treatment
28. Low cost automation

Method for conducting Graded activities

1. The student should individually select the topic, and search the information related to topic.
2. The report is strictly hand written document to have knowledge of precise writing and report making based on data collection



3. Carry out class room presentation.

2. Guest Lecturers: To be organized from any two of the following areas 15 HRS

Experts / Professionals from different field/industries are invited to deliver lectures at least TWO sessions in a semester. The topics may be selected by the teacher /industry expert to develop required skills.

Note: The ISTE student chapter/CCTEK/ Institute of engineers (Institute chapter)/ student clubs of polytechnic may be used as platform to conduct this activity.

1. Pollution control.
2. Non destructive testing.
3. Fire Fighting / Safety Precautions and First aids.
4. Computer Networking and Security.
5. Career opportunities,
6. Yoga Meditation,
7. Aids awareness and health awareness.
8. Use of plastics in automobiles.
9. Nonferrous Metals and alloys for engineering applications
10. Surface Treatment Processes like electroplating, powder coating etc.
11. Computer aided drafting.
12. Industrial hygiene.
13. Composite Materials.
14. Heat treatment processes.
15. Ceramics
16. Safety Engineering and Waste elimination
17. Interview Techniques.
18. Alternate fuels – CNG / LPG , Biodiesel, Ethanol, hydrogen
19. Piping technology
20. Electronic fuel injection systems
21. Exhaust gas analysis.
22. Vehicle testing.
23. Environmental pollution & control.
24. Vehicle aerodynamics & design.
25. Earth moving machines.
26. Biotechnology
27. Nanotechnology
28. Rapid prototyping
29. Programmable logic controllers
30. TQM
31. MPFI
32. Hybrid motor vehicles
33. Packaging technology
34. Cloud computing
35. Expert systems

Method for conducting Guest lectures

1. The teacher/ISTE student chapter convener should fix up the date for guest lecture
2. The HOD of the department should chair the event
3. The students of class allowed to participate in the session



4. Watch the talk and make the brief hand written report on the guest lecture delivered by each student as a part of Term work.
5. Make Audio/visual record of the guest lecture by using any smart devices
6. Opportunity should be provided for students for live Interaction with experts and record it on any one smart device.

3. Group Discussion: (One topic)

15HRS

The students shall discuss in group of six students .Some of the suggested topics are

1. Polythene bags must be banned!
2. Do we really need smart cities?
3. E – Books or Printed books – what's your choice?
4. Is Face book for the attention – seeking and lazy people?
5. Globalization and its impact on Indian Culture.
6. Analytically evaluate the solutions to traffic problems
7. Global warming is caused more by developed countries
8. Rain forests help in maintaining the earth's ecosystem
9. Reservation for women would help the society
10. How to deal with terrorism
11. Water resources should be nationalized
12. Daughters are more caring than sons
13. NGOs - Do they serve people's interests?
14. Managers are born, not trained
15. Managerial skills learnt in the classroom
16. Women are good managers
17. India's growth rate is bridging gap between rich and poor.
18. Nuclear power is a safe source of energy
19. Electronic media vs. print media
20. Corruption is the price we pay for democracy
21. Multinational corporations: Are they devils in disguise?
22. Advertising is a waste of resources.
23. Privatization will lead to less corruption.
24. China market - a threat to Indian market
25. Technology Creates Income Disparities
26. India should be reorganized into smaller states.
27. Rising petrol prices - Govt. can control?
28. Smaller businesses and start-ups have more scope
29. Developing countries need trade, not aid.
30. Business and Ethics do not go together
31. Performance based bonuses for government employees should be welcomed
32. Depreciation of Indian Rupee has only negative impact on the economy
33. Gold: Best investment or a bursting bubble?
34. Freedom of press should exist
35. India needs a strong dictator
36. Media is a mixed blessing/How ethical is media?
37. Computer viruses are good
38. India should practice "Swadeshi"
39. The government should stop funding IIT's and IIM's
40. Food Bill - Is it really something India needs?
41. Will India really be the superpower of 21st century?



42. Quality is a myth in India.
43. China - A threat to India?
44. Indian villages - our strength or our weakness?
45. Mobile phones - requirement of the day.
46. Cursing the weather is bad farming
47. If you want peace, prepare for war
48. Education is a progressive way of discovering your ignorance.
49. Beauty contests degrade womanhood
50. If you are not a part of the solution, you are part of the problem
51. Examinations - has it killed education?
52. The medium of teaching in schools should be English
53. A room without books is like a body without soul.
54. Educated Indians lack national commitment.
55. E-Learning is good for the education system and society

Methodology for conducting Group discussion/Seminar

1. The teacher will allot a topic for a group of six students
2. The teacher should give an introductory talk on Ways and rules to carry out group discussion
3. The students should ask to show interest with others and work effectively with them to meet common objective. The teacher should provide tips to accept feedback in a constructive and considerate way and how to handle frustrations in group, while discussion.
4. The placement officer and any other senior faculty of the institute/ HOD of other department should be invited and they should act as observing members, apart from teacher
5. The teacher should fix up the time duration for initiating and conducting the activity
6. **Documentation to be produced for validation**
 - Hand written document on minutes of discussion, description of the topic discussed
 - Record the few minutes of discussion by smart device

4. Individual Assignments and Life skills

15HRS

The students will perform ANY ONE of the following activities individually (other similar activities may be considered) in both the sections

A. Individual assignments

1. Collecting Failure data for automobile / machines / equipment.
2. Study of Hydraulic system for any one application like – dumpers, Earth moving equipment, Auto service station.
3. Survey of oils used for hydraulic circuits – specifications, properties, costs, manufacturers names etc.
4. Study any one type of CNC machining centre and prepare report on tooling and tool holding devices
5. For a given job write a sequence of operations performed by automated manufacturing system. Draw a block diagram of control system to perform above operations
6. Survey of types of bearings involving information about construction working principles, mounting, lubrication, materials, advantages, limitations and cost.



7. Prepare a trouble shooting chart for any refrigeration system and suggest remedial measures to avoid failures
8. For a drilling or milling operations on a simple machine component,
9. Draw a jig or fixtures showing various features like locating clamping, fool proofing etc.
10. Compare non traditional methods on the basis of working principles, accuracy , MRR, Applications and limitations a) EBM b) PAM C)AJM d)WJM

B. Life skills

1. Conduct aptitude, general knowledge test, IQ test, Solve Puzzles.
2. Set the goal for personal development.
3. Develop good habits to overcome stress.

Methodology for conducting activity

1. The teacher will assign a topic for individual student; give sufficient time to complete the task. Ask the student to submit an hand written report
2. The teacher should conduct any one specified life skill activity with local NGO/ placement cell/ISTE student chapter/CCTEK/ NSS unit of the institute. The student should present his/her experiences in a class and make report.

5. Industrial Visits

18HRS

Structured industrial visits be arranged and report of the same shall be submitted by the individual student, to form a part of the term work. Following are the suggested types of Industries/ Fields.

Note: One Industrial visit is arranged per practical batch of students.

1. Automobile manufacturing / press component / auto component manufacturing units to observe the working of SPM / Non Conventional Manufacturing process / CNC / FMS / Robots
2. Refrigeration and air conditioning manufacturing / servicing units
3. Industries
4. State transport depot/workshops
5. Automobile service stations for four wheelers/Wheel Balancing unit for light and/or heavy motor vehicles/exhaust gas analysis and vehicle testing / ST workshop.
6. Co-ordinate measuring machine to observe its construction working specifications and applications. Engine Testing unit to gather details regarding the testing procedures/parameters etc.
7. Food processing/ Dal mill/ Oil Mill/ Automated bakery unit.
8. Textile industry / Textile machinery manufacturing / garment manufacturing /embroidery / textile printing and dyeing units.
9. Hydro electric and Thermal power plants.
10. Tyre retreading, paint manufacturing, foundries, forging unit, heavy fabrication unit, steel and wooden furniture/Toys manufacturing/Agricultural equipment manufacturing units.
11. Hardware and Machinery stores selling agro equipment
12. Plastic injection moulding, extrusion, blows moulding.
13. Stone crushers / hot mix plant/ service stations of JCBs and other earthmoving equipment

M Methodology for conducting activity

1. The subject teacher(s) have liberty to select nearby organization/industry of local vicinity with prior approval of principal of the institute
2. Arrange the nearby visit and Prepare a word processing report of the visit including details observations made, Details of visit should be mentioned with date , place etc



Course Delivery:

The course will be delivered through discussions and activities

Course Assessment and Evaluation Scheme:

	What		To whom	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment meth	CIE	IA	Students	Each activities @5 marks each	25	Report	1,2,3,4,5
				End of the course	50	Answer scripts at BTE	1,2,3,4,5
Indirect Assessment	Student Feedback on course		Students	Middle of the course		Feedback forms	1,2,3 Delivery of course
	End of Course Survey			End of the course		Questionnaires	1,2,3,4,5,6 Effectiveness of Delivery of instructions & Assessment Methods

Note to IA verifier: The following documents to be verified by CIE verifier at the end of semester

1. Student activities report for 25 marks
2. Student feedback on course regarding Effectiveness of Delivery of instructions & Assessment Methods.

For end examination:

1. **Note for examiners : The records of the activities should be preserved in the department for minimum three years and the examiner should verify these records to prevent duplication of the activity**

Scheme of Valuation for End Examination

Serial no	Description	Marks
1	Report and presentation on Information Search and Data collection	10
2	Document on Guest Lecturer by experts	10
3	Recording of Group discussions made by any smart devices	10
4	Report on Individual assignment/ Life skill activity recorded	10
5	Report on Industrial visit	10
	TOTAL	50



• MODEL OF RUBRICS /CRITERIA FOR ASSESSING STUDENT ACTIVITY

RUBRICS FOR ACTIVITY(5 Marks)						
Dimension	Unsatisfactory	Developing	Satisfactory	Good	Exemplary	Student Score
	1	2	3	4	5	
Collection of data	Does not collect any information relating to the topic	Collects very limited information; some relate to the topic	Collect much information; but very limited relate to the topic	Collects some basic information; most refer to the topic	Collects a great deal of information; all refer to the topic	Ex: 4
Fulfil team's roles & duties	Does not perform any duties assigned to the team role	Performs very little duties but unreliable.	Performs very little duties	Performs nearly all duties	Performs all duties of assigned team roles	5
Shares work equally	Always relies on others to do the work	Rarely does the assigned work; often needs reminding	Usually does the assigned work; rarely needs reminding	Normally does the assigned work	Always does the assigned work without having to be reminded.	3
Listen to other Team mates	Is always talking; never allows anyone else to speak	Usually does most of the talking; rarely allows others to speak	Talks good; but never show interest in listening others	Listens, but sometimes talk too much	Listens and speaks a fair amount	2
Average / Total marks=(4+5+3+2)/4=14/4=3.5=4						

Note: This is only an example. Appropriate rubrics/criteria may be devised by the concerned faculty (Course Coordinator) for assessing the given activity



MODEL QUESTION PAPER

- Semester Diploma Examination

Course Title: **PROFESSIONAL PRACTICES**

Time: **3 Hours**]

[Max Marks: **50**

1. Write brief note on information searched and data collected activity 10marks
2. Give brief explanation about knowledge acquired by you during the guest lecture 10 marks
3. Write the conclusion of the topic given for the group discussion 10 marks
4. Write brief note on individual assignment performed and information gathered and data collected activity 10marks
5. Write the sequence of processing followed in the industry/work shop You have visited 10 marks

Note: The marks should be awarded on the basis of Reports/Documents submitted by the student

