1. SALIENT FEATURES OF THE DIPLOMA PROGRAMME IN MECHATRONICS

1)	Name of the Programme	:	Diploma Programme in Mechatronics
2)	Duration of the Programme	:	Three years (Six Semesters)
3)	Entry Qualification	:	Matriculation or equivalent as prescribed by State Board of Technical Education, Haryana
4)	Intake	:	40/60 (or as prescribed by the Board)
5)	Pattern of the Programme	:	Semester Pattern
6)	Ratio between theory and practice	:	50 : 50 (Approx.)

7) Industrial Training:

Four weeks of industrial training is included after IV semester during summer vacation. Internal assessment out of 50 marks and external assessment out of another 50 marks will be added in 5th semester. Total marks allotted to industrial training will be 100.

Distribution of Marks:

- Daily diary and reports of training - 50 Marks
- Viva Voce (External) - 50 Marks

8) Ecology and Environment:

As per Govt. of India directives, a subject on Environmental Education has been incorporated in the scheme.

9) Entrepreneurship Development:

A subject on Entrepreneurship Development and Management has been incorporated in the scheme.

10) Student Centred Activities:

A provision of 5-6 hrs per week has been made for organizing Student Centred Activities for overall personality development of students. Such activities will comprise of co-curricular activities like extension lectures, library studies, games, hobby clubs e.g. photography, painting, singing, seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, Civil Defence/Disaster Management activities etc.

2. EMPLOYMENT OPPORTUNITIES FOR DIPLOMA HOLDERS IN MECHATRONICS

Mechatronics is a discipline which implies a mixture of various engineering disciplines like electrical, electronics, mechanical and computer that serves the very purpose of controlling advanced hybrid systems. Mechatronics is the field of engineering which focuses on the design and production of automated equipment.

Diploma holders in this field apply their knowledge to design, develop, operate and maintain high tech systems and products that entail automation and high performance. There is a lot of scope of Mechatronics as it incorporates the ideas of Electronic and Mechanical Engineering into one entity and covers those areas of engineering which is concerned with the increasing integration of mechanical, electronic and software engineering into a production process. It takes the principles of electronics, mechanics and computing to design a simpler and economical system.

A diploma holder in Mechatronics has employment opportunities in any industry using automation. He/she can work in fields like process industry (textile, food, pharamaceutical, chemical etc.), manufacturing, automobile, transport including metros, robotics,defence, aerospace and aviation.

There are also job opportunities in the Army, the Navy and the Air force and organisations like the Defence Research and Development Organisation (DRDO) and Indian Space Research Organisation (ISRO).Diploma holders also find employment in technical/ vocational training institutions. In addition, there are avenues in sales and service of automation products.

There are also good avenues of self employment for these diploma holders as entrepreneurs.

3. COMPETENCY PROFILE OF DIPLOMA HOLDERS IN MECHATRONICS

Keeping in mind the employment opportunities, a diploma holder in Mechatronics should have following competencies:

1. Understanding of basic principles of Electrical, Electronics and Mechanical Engineering.
2. Understanding of basic principles of digital electronics and embedded systems and their applications in automation system.
3. Knowledge of power electronics and industrial operations
4. Skills in fabrication and testing of different types of electronic circuits and devices.
5. Ability to use electrical, electronics and mechanical measuring instruments and skill of operating instruments and inspection techniques.
6. Ability to use and operate basic production machines, tools and equipment including use of high-tech machines, CNC machines and PLC (programmable Logic Controllers) for increased productivity and quality.
7. Implementing quality management techniques, quality control tools and standards.
8. Knowledge and skills in the operation and maintenance of various plant facilities like material handling equipment and operating facilities.
9. Knowledge of sensors and transducers and their interfacing with controllers.
10. Knowledge and skill of electric, pneumatic and hydraulic sensors, actuators and controllers and their use in design of automation systems.
11. Knowledge of distributed control system.
12. Competency in problem solving in various functional areas may it be prototype development, diagnostic and faultfinding or repair and maintenance of plant and equipment.
13. Knowledge and skills in communication, interpersonal relations and basic skills in management.

14. Understanding regarding labour management and awareness regarding Laws and Acts related to labour welfare, environment, health and safety.

15. Knowledge about effluents and pollution and methods to control pollution.

16. Appreciation of appropriate attitudes, professional ethics and values.

17. Awareness regarding facilities and support system to promote entrepreneurship.

18. Reading interpreting and preparing Electrical Engineering and Mechanical Engineering drawings.

19. Knowledge and skills in applied sciences so as to develop scientific temper and their application in technology subjects and as a foundation for continued learning.

20. Knowledge and skills in Engineering Sciences which are pre-requisite to understand technology subjects

4. DERIVING CURRICULUM AREAS FROM COMPETENCY PROFILE

Sr. No.	COMPETENCY PROFILE	CURRICULUM AREAS
1.	Understanding of basic principles of Electrical, Electronics and Mechanical Engineering.	▪ Electrical Engineering Fundamentals ▪ DC and AC machines
2.	Understanding of basic principles of digital electronics and embedded systems and their applications in automation system.	▪ Digital Electronics ▪ Embedded systems
3.	Knowledge of power electronics and industrial electronics	▪ Power Electronics
4.	Skills in fabrication and testing of different types of electronic circuits and devices.	▪ Analog Electronic Devices ▪ Digital Electronics
5.	Ability to use electrical, electronics and mechanical measuring instruments and skill of operating instruments and inspection techniques.	▪ Inspection and Quality control ▪ Process control and Data communication
6.	Ability to use and operate basic production machines, tools and equipment including use of high-tech machines, CNC machines and PLC (programmable Logic Controllers) for increased productivity and quality.	▪ Manufacturing Processes ▪ CNC Machine and Automation
7.	Implementing quality management techniques, quality control tools and standards.	▪ Inspection and Quality Control
8.	Knowledge and skills in the operation and maintenance of various plant facilities like material handling equipment and operating facilities.	▪ Robotics
9.	Knowledge of sensors and transducers and their interfacing with controllers.	▪ Instrumentation
10.	Knowledge and skill of electric, pneumatic and hydraulic sensors, actuators and controllers and their use in design of automation systems.	▪ Hydraulic and Pneumatic systems
11.	Knowledge of distributed control system.	▪ Industrial automation
12.	Competency in problem solving in various functional areas may it be prototype development, diagnostic and faultfinding or repair and maintenance of plant and equipment.	▪ Project work ▪ Computer Programming and application
13.	Knowledge and skills in communication, interpersonal relations and basic skills in management.	▪ Communication Skill ▪ Employability skills
14.	Understanding regarding labour management and awareness regarding Laws and Acts related to labour welfare, environment, health and safety.	▪ Entrepreneurship Development and Management
15.	Knowledge about effluents and pollution and methods to control pollution.	▪ Environmental Education
16.	Appreciation of appropriate attitudes, professional ethics and values.	▪ Employability Skills

17.	Awareness regarding facilities and support system to promote entrepreneurship.	▪ Entrepreneurship Development and Management
18.	Reading interpreting and preparing Electrical Engineering Instrumentation and Mechanical Engineering drawings.	▪ Engineering Drawings ▪ Mechatronics-Design and Drawing
19.	Knowledge and skills in applied sciences so as to develop scientific temper and their application in technology subjects and as a foundation for continued learning.	▪ Applied Physics ▪ Applied Chemistry ▪ Applied Mathematics
20.	Knowledge and skills in Engineering Sciences which are pre-requisite to understand technology subjects	▪ Applied Mechanics ▪ Engineering materials ▪ Hydraulic and Pneumatics Systems

5. ABSTRACT OF CURRICULUM AREAS

Following is the abstract of curriculum areas:

5.1 Applied Science

- Applied Mathematics
- Applied Physics
- Applied Chemistry
- Basics of Information Technology

5.2 Engineering Sciences

- Engineering Drawing
- Applied Mechanics

5.3 Core Engineering/Technology

- Mechanical Engineering Fundamentals
    - Manufacturing Processes
    - Electrical and Electronics
    - Computer Programming and applications
    - Analog Electronics Devices
    - Digital Electronics
    - DC and AC Machines
    - Instrumentation
    - Electrical and Electronic Instruments and measurement
    - Hydraulic and Pneumatic Systems
    - Mechatronics - Design and Drawing
    - CNC Machines and Automation
    - Power Electronics
    - Embedded Systems
    - Process Control and Data Communication
    - Industrial Automation
    - Robotics
    - Inspection and Quality Control
    - Mechanisms and Machines
    - Industrial Training
    - Project Work

5.4 Management Subjects

- Communication Skills
- Employability Skills
- Environmental Education
- Entrepreneurship Development and Management

5.5 Student Centred Activities

It includes industrial visits, extension lectures, seminars, library studies, hobby clubs, sports and games and cultural activities.

6. HORIZONTAL AND VERTICAL ORGANISATION

Sr. No.	Subject	Distribution of time in various semesters					
		I	II	III	IV	V	VI
1.	Communication Skills	5	5	-	-	-	-
2.	Applied Mathematics	5	5	-	-	-	-
3.	Applied Physics	6	6	-	-	-	-
4.	Applied Chemistry	5	5	-	-	-	-
5.	Engineering Drawing	6	6	-	-	-	-
6.	General Workshop Practice	6	6	-	-	-	-
7.	Basics of Information Technology	4	-	-	-	-	-
8.	Applied Mechanics	-	5	-	-	-	-
9.	Manufacturing Processes	-	-	12		9	
10.	Mechanical Engineering Fundamentals	-	-	4			
11.	Electrical Engineering Fundamental	-	-	6			
12.	Computer programming and application	-	-	6			
13.	Analog Electronics Devices	-	-	7			
14.	Digital Electronics	-	-		5		
15.	DC and AC Machines	-	-		6		
16.	Instrumentation	-	-		5		
17.	Electrical and Electronic Instruments and measurement	-	-		6		
18.	Hydraulic and Pneumatic Systems	-	-		6		
19.	Mechatronics- Design and Drawing	-	-		6		
20.	CNC Machine and Automation	-	-			5	
21.	Power Electronics	-	-			6	
22.	Employability Skills	-	-			2	2
23.	Environmental Education	-	-			3	
24.	Embedded Systems	-	-			7	
25.	Process Control and Data Communication	-	-			3	
26.	Industrial Automation	-	-				6
27.	Robotics	-	-				6
28.	Inspection and Quality Control	-	-				6
29.	Entrepreneurship Development and Management						3
30.	Mechanisms and Machine						3
31.	Project Work	-	-				9
32.	Student Centered Activities	3	2	5	6	5	5
	Total	**40**	**40**	**40**	**40**	**40**	**40**