

Diploma Programme In

ELECTRONICS AND COMMUNICATION ENGINEERING

1. SALIENT FEATURES OF THE PROGRAMME

- 1) Name of the Programme : Diploma Programme in **Electronics and Communication Engineering**
- 2) Duration of the Programme : Three years (6 semester)
- 3) Entry Qualification : Matriculation or equivalent as prescribed by State Board of Technical Education, Haryana
- 4) Intake : 60
- 5) Pattern of the Programme : Semester Pattern
- 6) Ratio between theory and Practical : 45 : 55(Approx)

7) **Industrial Training:**

A minimum duration of four weeks of industrial training is included after 4th semester during summer vacation. An Internal assessment out of 50 marks and an external assessment out of another 50 marks have been 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 - 50 Marks

8) **Ecology and Environment :**

As per directives of Government 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. **Personality Development**

A camp focusing on personality development of students has been incorporated in the fifth semester. There will be assessment under SCA.

11. **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 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 AND ACTIVITY PROFILE OF DIPLOMA HOLDERS IN ELECTRONICS AND COMMUNICATION ENGINEERING

An exercise, to have first hand information about employment opportunities and activity profile of diploma engineers in the field of electronics, was done by Curriculum Development Centre of National Institute of Technical Teachers' Training and Research, Chandigarh. The feedback from industries and other organizations has revealed that diploma holders in Electronics and Communication Engineering find employment in the following organizations:

(A) *EMPLOYMENT OPPORTUNITIES*

Various Departments/ organizations/boards and corporations

- 1) Tele-Communication Engineering and related Departments
- 2) AIR, Doordarshan,
- 3) Overseas Communication,
- 4) Mine Communication,
- 5) Radar and Wireless,
- 6) Railways,
- 7) Defence Services, Para-military Forces and Police
- 8) Civil Aviation
- 9) Defence Research and Development Organizations (DRDO)
- 10) Electricity Boards and Corporations etc.
- 11) Engineering Institutions
- 12) Research and Development Deptt.
- 13) Maintenance Department.
- 14) Airport Authority of India (Airports)

Industry

- 15) Communication Industry manufacturing wireless mobile equipment for defence and Paramilitary forces
- 16) PCB Design and Fabrication Industry
- 17) Consumer Electronics Industry
- 18) Electronic Components and Devices Manufacturing and Installation Organizations
- 19) Computer Assembling and Computer Peripheral Industry;

- 20) Computer Software Areas for Electronic Design and Semi Conductor Manufacturing Industry
- 21) Instrumentation and Control Industries
- 22) Internet Server Provides
- 23) Food Product Industries
- 24) Construction Industries
- 25) Agro and dairy Industry
- 26) Public Sector Undertakings (like BHEL, BEL, HAL, etc)
- 27) D.T.H component and Fabrication factory
- 28) Mobile Phone assembly Industries
- 29) Medical Electronics Industry
- 30) EPABX/ Telephone Exchange Manufacturing Industries
- 31) Computer Software Areas for Electronic Design and Semi Conductor Manufacturing Industry
- 32) Computer Assembling and Computer Peripheral Industry;
- 33) Automobile Industry
- 34) Automation and Control Industry (viz bottling plant, cement plant, automobile units, escalators etc.

Development/Testing Laboratories/Organizations

- 35) Electronics Service Centres
- 36) Opto Electronics (Medical & Comm.)
- 37) Computer Networking
- 38) Hospitals
- 39) Educational Institutions (Engineering Institutes, ITIs, Vocational Schools etc)
- 40) Sales and Services of Electronic Gadgets from Small Scale Industries
- 41) Call Centres

Self Employment

- Marketing and Sales (Distributors - whole sale and retailers)
- Service Sector(repair and Maintenance; job work)
- Cable laying and jointing DBs etc.
- Preparing Simulated Models
- Manufacturing Unit (e.g.- Bulb manufacturing, chalk manufacturing, circuit manufacturing units etc)

(B) JOB/ACTIVITY PROFILE

The diploma holders in Electronics and Communication Engineering (ECE) generally get employed in manufacturing, assembly industries of consumer electronics, manufacturing of wireless equipment, Doordashan and All India Radio (AIR), defence organizations, marketing and servicing organizations. Some of the activities they perform are listed below:

- 1) Reading, interpreting and preparing drawings and circuits in electronics and related fields
- 2) Supervising the fabrication and assembly work at sub-assembly and final assembly
- 3) Selecting components and devices for simple applications
- 4) Testing the materials used in assembly work.
- 5) Assisting the engineer in quality control of the product being assembled or manufactured
- 6) Operating, recording and display equipment in AIR/Doordarshan, satellite stations and studios
- 7) Supervising of the fabrication and assembly work of trans-receivers and walkie-talkie used for police wireless, mines communication and defence services
- 8) Operation, testing and maintenance of radar equipment used in defence services
- 9) Preparing estimates for different jobs of installation and maintenance
- 10) Assistance to the engineers/scientist doing research/development work by fabricating and testing different electronic circuits
- 11) Operates, maintains and tests computer and computer peripheral equipment
- 12) Supervising the assembly and testing work in computer industry
- 13) Operates wireless/ radar in defence services
- 14) Assists in firing and maintenance of guided weapons and launching equipment
- 15) As a self employed person he/she has to use multifarious activities such as designing PCBs, procuring raw material and components, assemble, manufacture, repair and maintenance, testing and fault diagnosis, sale and service, marketing etc.
- 16) Customer care service (BPOs etc)
- 17) As Internet service providers for LAN, WAN, VPN, and Internet. Configuration of Routers, Firewall, ATMs, L-3- switches Voip etc.

3. COMPETENCY PROFILE OF DIPLOMA HOLDERS IN ELECTRONICS AND COMMUNICATION ENGINEERING

Keeping in view the job opportunities, activity profile and various domains of learning, the diploma holders in Electronics and Communication Engineering should have following competency profile in terms of knowledge and skills:

- 1) Skills in reading and interpreting drawings pertaining to electronic circuits, instruments, and equipment
- 2) Understanding of basic principles of electrical and electronics engineering
- 3) Understanding of electrical machines and equipment
- 4) Understanding of basic principles of digital electronics; communication engineering and systems; audio video systems and industrial electronics
- 5) Knowledge of different electronic devices, components, materials and instruments used in manufacturing and testing of electronic products
- 6) Skills in fabrication and testing of different types of electronic circuits and devices by making use of testing and measuring instruments
- 7) Skills in fabrication of PCBs and designing the layout of various instruments, chassis and equipment for wiring/circuit development
- 8) Knowledge of installation and maintenance of
 - Electronic telephone exchanges
 - Communication systems and Tele communication Systems
 - Computer systems and Networking

- 9) Knowledge and skills pertaining to installation and maintenance of industrial electronics equipment and system and process control instrumentation
- 10) Knowledge and skills in using information technology tools for information storage, retrieval and dissemination, and making use of computer application software and Networking
- 11) Competency in solving simple problems related to various functional areas of electronics engineering may it be prototype development, diagnostic and fault finding or repair and maintenance of plant and equipment pertaining to:
 - Electronic measuring instruments
 - Electronic consumer goods
 - Entertainment equipment (Audio/video system)
 - Communication systems
 - Wireless and mobile communication
- 12) Knowledge of Microwave and Radar Engineering and Optical Fibre Communication
- 13) Knowledge of microprocessors, Microcontrollers and their applications in electronic system
- 14) Understanding of various relevant standards for testing and quality control in electronics
- 15) Knowledge of latest trends in the field of communication, tele-communication and instrumentation
- 16) Knowledge of basic principles of management and entrepreneurship to manage men, material and machines optimally and efficiently, awareness about the environment, use of non-conventional energy sources, external financial and technical support system, adopting energy conservation techniques

- 17) Knowledge of applied and engineering sciences for better comprehension of technologies used in electronics and related industry and service sector and to develop scientific temper, analytical skills and to facilitate continuing education
- 18) Proficiency in oral and written communication, technical report writing, managing relationship with juniors, peers and seniors for effective functioning in the world of work

4. DERIVING CURRICULUM AREAS FROM COMPETENCY PROFILE

Following curriculum areas have been derived from competency profile as identified in Section 3:

Sr. No.	Competency Profile	Curriculum Area/Subjects
1.	Skills in reading and interpreting drawings pertaining to electronic circuits, instruments and equipment	<ul style="list-style-type: none"> - Engineering Drawing - Analog Electronics
2.	Understanding of basic principles of electrical and Electronics Engineering,	<ul style="list-style-type: none"> - Basic Electrical Engineering - Analog Electronics - Digital Electronics
3.	Understanding of electrical machines and equipment	<ul style="list-style-type: none"> - Electrical Machines - Analog Electronics
4.	Understanding of basic principles of digital electronics; communication engineering and systems; audio video systems and industrial electronics	<ul style="list-style-type: none"> - Digital Electronics - Audio Video Systems/ Consumer Electronics - Principles of Communication Engineering
5.	Knowledge of different electronic devices, components, materials and instruments used in manufacturing and testing of electronic products	<ul style="list-style-type: none"> - Electronic Components and Materials - Electronic Instruments and Measurement - Instrumentation -
6.	Skills in fabrication and testing of different types of electronic circuits and devices by making use of testing and measuring instruments	<ul style="list-style-type: none"> Electronic Instruments and Measurement - Instrumentation - Electronic Circuits and Devices/ Analog Electronics
7.	Skills in fabrication of PCBs and designing the layout of various instruments, chassis and equipment for wiring/circuit development	<ul style="list-style-type: none"> - Electronics Design and Fabrication Techniques - Electronic Workshop

Sr. No.	<u>Competency Profile</u>	<u>Curriculum Area/Subjects</u>
8.	Knowledge of installation and maintenance of : <ul style="list-style-type: none"> - Electronic telephone exchanges - Communication systems and Tele- communication Systems - Computer systems and Networking 	<ul style="list-style-type: none"> - Fault Diagnosis and Trouble-Shooting and Maintenance of Electronic Equipment - Communication Systems - Maintenance of Computer Systems
9.	Knowledge and skills pertaining to installation and maintenance of industrial electronics equipment and system and process control instrumentation	<ul style="list-style-type: none"> - Power Electronics - Electrical Machines
10.	Knowledge and skills in using information technology tools for information storage, retrieval and dissemination, and making use of computer application software and Networking	<ul style="list-style-type: none"> - Basics of Information Technology - Computer Programming and Applications
11.	Competency in solving simple problems related to various functional areas of electronics engineering may it be prototype development, diagnostic and fault finding or repair and maintenance of plant and equipment pertaining to: <ul style="list-style-type: none"> - Electronic measuring instruments - Electronic consumer goods - Entertainment equipment (Audio/video system) - Communication systems - Wireless and mobile communication 	<ul style="list-style-type: none"> - Fault Diagnosis and Trouble Shooting of Electronic Goods and equipment - Consumer Electronics - Communication Systems - Telemetry - Wireless and Mobile Communication
12.	Knowledge of Microwave and Radar Engineering and Optical Fibre Communication	<ul style="list-style-type: none"> - Microwave and Radar Engineering - Optical Fibre Communication
13.	Knowledge of microprocessors, Microcontrollers and their applications in electronic system	<ul style="list-style-type: none"> - Microprocessors and Peripheral Devices - Micro controllers
14.	Understanding of various relevant standards for testing and quality control in electronics	<ul style="list-style-type: none"> - Trouble Shooting of Electronic Equipment

Sr. No.	<u>Competency Profile</u>	<u>Curriculum Area/Subjects</u>
15.	Knowledge of latest trends in the field of communication, tele-communication and instrumentation	<ul style="list-style-type: none"> - Optical Fibre Communication - Satellite Communication - Digital Signal Processing - VLSI System Design - Medical Electronics
16.	Knowledge of basic principles of management and entrepreneurship to manage men, material and machines optimally and efficiently, awareness about the environment, use of non-conventional energy sources, external financial and technical support system, adopting energy conservation techniques	<ul style="list-style-type: none"> - Entrepreneurship Development and Management - Personality Development - Employability Skills
17.	Knowledge of applied and engineering sciences for better comprehension of technologies used in electronics and related industry and service sector and to develop scientific temper, analytical skills and to facilitate continuing education	<ul style="list-style-type: none"> - Applied Physics - Applied Mathematics - Applied Chemistry - Engineering Drawing, CAD - Workshop Practice
18.	Proficiency in oral and written communication, technical report writing, managing relationship with juniors, peers and seniors for effective functioning in the world of work	<ul style="list-style-type: none"> - Employability Skills - Communication Skills - Project Work

5. ABSTRACT OF CURRICULUM AREAS/ SUBJECTS

The subjects have been divided in four different categories:

1. ***Basic Sciences***

- (1) Communication Skills - 1 & II
- (2) Employability Skills - 1 & II
- (3) Environmental Education
- (4) Entrepreneurship Development and Management

2. ***Applied Sciences***

- (5) Applied Physics - I & II
- (6) Applied Chemistry - I & II
- (7) Applied Mathematics - I and II

3. ***Basic Courses in Engineering/ Technology***

- (8) Engineering Drawing-I
- (9) General Workshop Practice - I & II
- (10) Basics of Information Technology

4. ***Area Specific Engineering/ Technology Subjects***

- (11) Basic Electrical Engineering
- (12) Analog Electronics - I & II
- (13) Electronic Instruments and Measurement
- (14) Principles of Communication Engineering
- (15) Digital Electronics- I & II
- (16) Electrical Machines
- (17) Computer Programming and Applications
- (18) Network, Filters and Transmission Lines
- (19) Communication Systems
- (20) Instrumentation
- (21) Microprocessor and Peripheral Devices
- (22) Electronic Design and Fabrication Techniques
- (23) Consumer Electronics
- (24) Power Electronics
- (25) Trouble Shooting of Electronic Equipment

- (26) Optical Fibre Communications
- (27) Maintenance of Computer System
- (28) Microwave and Radar Engineering
- (29) Wireless and Mobile Communication
- (30) Major Project Work

5 Specialised Courses in Engineering/ Technology

Elective to choose any one from the following:

- (31) Medical Electronics
- (32) VLSI System Design

In addition,

- a) *Personality Development Camp will be organized in 5th semester*
- b) Industrial Training:

There will be industrial training during summer vacation after 4th semester. An Internal assessment out of 50 marks and an external assessment out of another 50 marks have been added in 5th semester. Total marks allotted to industrial training will be 100.

