

Model Curriculum for
B.Voc/ D.Voc
in
Medical Image Technology



All India Council for Technical Education
Nelson Mandela Marg, New Delhi

1. Introduction

All India Council for Technical Education (AICTE) Ministry of HRD, Government of India has introduced Entrepreneurship oriented Skill development courses of B.Voc/D.Voc/Skill Diploma. These courses will be run by AICTE approved institutes by using available infrastructure and facilities. In these courses the institute will conduct general education content and sector specific skills will be imparted by Skill Knowledge Providers/ Training Providers/ Industries.

1.1 Key Features:

Objectives

- To provide judicious mix of skills relating to a profession and appropriate content of General Education.
- To ensure that the students have adequate knowledge and skills, so that they are work ready at each exit point of the programme.
- To provide flexibility to the students by means of pre-defined entry and multiple exit points.
- To integrate NSQF within the undergraduate level of higher education to enhance employability of the students and meet industry requirements. Such student apart from meeting the needs of local and national industry are also expected to be equipped to become part of the global workforce.
- To provide vertical mobility to students admitted in such vocational courses.
- The certification levels will lead to Diploma/Advanced Diploma/B. Voc. Degree in Electronic Manufacturing Services and will be offered by respective affiliating University/Board of Technical Education.
- Students may be awarded Level Certificate/Diploma/Advance Diploma /Degree as out-lined in the Table below:

Award	Duration after class X	Corresponding NSQF level
Level 3 Certificate	1 Year	3
Level 4 Certificate	2 Years	4
Diploma	3 Year	5
Advance Diploma	4 Years	6
B.Voc Degree	5 Years	7

2. Course Objectives

After successfully completing the vocational course, the student would have acquired relevant appropriate and adequate technical knowledge together with the professional

skills and competencies in the field of Medical Imaging Technology so that he/she is properly equipped to take up gainful employment in this Vocation. Thus he/she should have acquired.

A. Understanding of

- (a) The relevant basic concepts and principles in basic science subjects (Physics, Chemistry and Biology) so that he/she is able to understand the different vocational subjects.
- (b) The basic concepts in engineering drawing.
- (c) The concepts, principles of working of basic electronic devices and circuits.
- (d) The knowledge of procedures of medical imaging.
- (e) The procedure of operation and upkeep of Medical Imaging equipments.
- (f) The concepts and principles used in safety while using equipments.

B. Adequate Professional Skills and Competencies in

- (a) Testing different electronic components.
- (b) Testing the performance of electronic circuits.
- (c) Locating the fault at component level and at the stage level.

C. A Healthy and Professional Attitude so that He/She has

- (a) An analytical approach while working on a job.
- (b) An open mind while locating/rectifying faults.
- (c) Respect for working with his/her own hands.
- (d) Respect for honesty, punctuality and truthfulness.

D. NSQF compliant skills in Qualification developed by sector skill council in Electronic sector

3. Course Structure

The course will consist of combination of practice, theory and hands on skills in the electronic sector.

Curriculum

The curriculum in each of the years of the programme would be a suitable mix of general education and skill development components.

Skill Development Components:

- The focus of skill development components shall be to equip students with appropriate knowledge, practice and attitude, to become work ready. The skill development components will be relevant to the industry as per its requirements.

- The curriculum will necessarily embed within itself, National Occupational Standards (NOSs) of specific job roles within the industry. This would enable the students to meet the learning outcomes specified in the NOSs.
- The overall design of the skill development component along with the job roles selected will be such that it leads to a comprehensive specialization in few domains.
- The curriculum will focus on work-readiness skills in each of the year of training.
- Adequate attention will be given in curriculum design to practical work, on the job training, development of student portfolios and project work.

General Education Component:

- The general education component adheres to the normal senior secondary and university standards. It will emphasize and offer courses which provide holistic development. However, it will not exceed 40% of the total curriculum.
- Adequate emphasis is given to language and communication skills.

The curriculum is designed in a manner that at the end of year-3, year-4 and year-5, students can meet below mentioned level descriptors for level 5, 6 and 7 of NSQF, respectively:

Level	Process required	Professional Knowledge	Professional skill	Core skill	Responsibility
Level 3	Person may carry put a job which may require limited range of activities routine and predictable	Basic facts, process and principle applied in trade of employment	Recall and demonstrate practical skill, routine and repetitive in narrow range of application	Communication written and oral with minimum required clarity, skill of basic arithmetic and algebraic principles, personal banking, basic understanding of social and natural environment	Under close supervision some responsibility for own work within defined limit

<p>Level 4</p>	<p>Work in familiar, predictable, routine, situation of clear choice</p>	<p>Factual knowledge of field of knowledge or study</p>	<p>Recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts</p>	<p>Language to communicate written or oral, with required clarity, skill to basic arithmetic and algebraic principles, basic understanding of social political and natural environment</p>	<p>Responsibility for own work and learning</p>
<p>Level 5</p>	<p>Job that requires well developed skill, with clear choice of procedures in familiar context</p>	<p>Knowledge of facts, principles, processes and general concepts, in a field of work or study</p>	<p>A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools materials and information</p>	<p>Desired mathematical skill, understanding of social, political and some skill of collecting and organizing information, communication.</p>	<p>Responsibility for own work and learning and some responsibility for other's works and learning</p>
<p>Level 6</p>	<p>Demands wide range of specialized technical skill, clarity of knowledge and practice in broad range of activity involving standard/ non-standard practices</p>	<p>Factual and theoretical knowledge in broad contexts within a field of work or study</p>	<p>A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study</p>	<p>Reasonably good in mathematical calculation, understanding of social, political and reasonably good in data collecting organizing information, and logical communication</p>	<p>Responsibility for own work and learning and full responsibility for other's works and learning</p>
<p>Level 7</p>	<p>Requires a command of wide ranging specialized theoretical and practical skill, involving variable routine and non-routine context</p>	<p>Wide ranging, factual and theoretical knowledge in broad contexts within a field of work or study</p>	<p>Wide range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study</p>	<p>Good logical and mathematical skill understanding of social political and natural environment good in collecting and organizing information, communication and presentation skill</p>	<p>Full responsibility for output of group and development</p>

Curriculum

Level	Code	Educational Component	Credit	Marks
3 Semester I	Theory			
	3.GE.01	Language – I	3	50
	3.GE.02	Applied Chemistry	3	50
	3.GE.03	Applied Physics	3	50
	3.GE.04	Applied Biology –I	3	50
	Lab/Practical			
	3.GP.01	Applied Chemistry Lab	1.5	50
	3.GP.02	Applied Physics Lab	1.5	50
	On-Job-Training (OJT)/Qualification Packs			
	Pharmacy Assistant (HSS/Q5401)		(Any one)	15
Medical Equipment Technician (Basic Clinical Equipment) (HSS/Q5601)				
3 Semester II	Theory			
	3.GV.01	General Foundation Course –I	3	50
	3.GV.02	Basic Electricity	3	50
	3.GV.03	Basic Electronics	3	50
	3.GV.04	Applied Biology – II	3	50
	Lab/Practical			
	3.VP.01	Basic Electricity – Lab	1.5	50
	3.VP.02	Basic Electronics – Lab	1.5	50
	On-Job-Training (OJT)/Qualification Packs			
	Any One of the QP's to be opted from the ones mentioned in Level 3 First semester		(Any one)	15
4 Semester I	Theory			
	4.GV.01	Engineering Science	3	50
	4.GV.02	Trouble Shooting & Maintenance of Electronics Equipment-I	3	50
	4.GV.03	IT Tools-I	3	50
	4.GE.01	Language – II	3	50
	Lab/Practical			
	4.VP.01	Engineering Science – Lab	1.5	50
4.VP.02	Trouble Shooting & Maintenance of Electronics Equipment's- Lab	1.5	50	

Level	Code	Educational Component	Credit	Marks	
	On-Job-Training (OJT)/Qualification Packs				
	X- ray Technician (HSS/Q0701)		(Any one)	15	200
	Radiation Therapy Technologist (HSS/Q0601)				
4 Semester II	Theory				
	4.GV.04	Physics and Technology in Imaging (I yr, Paper II)	3	50	
	4.GV.05	Digital Electronics	3	50	
	4.GV.06	Trouble Shooting & Maintenance of Electronics Equipment's-II	3	50	
	4.GV.07	IT Tools -II	3	50	
	Lab/Practical				
	4.VP.03	IT Tools - Lab	1.5	50	
	4.VP.04	Digital Electronics - Lab	1.5	50	
	On-Job-Training (OJT)/Qualification Packs				
Any One of the QP's to be opted from the ones mentioned in Level 4 First semester		(Any one)	15	200	
5 Semester I	Theory				
	5.GV.01	Electronic Measurement and Instrumentation -I	3	50	
	5.GV.02	Basic Anatomy (Paper I, Yr 1)	3	50	
	5.GV.03	Tools, Equipment & Safety Measures -I	3	50	
	5.GV.04	Soldering & De-Soldering of Components -I	3	50	
	Lab/Practical				
	5.VP.01	Identification of Components, Tools, Equipment and its working -Lab	1.5	50	
	5.VP.02	Basic diagnostics (Practical of Paper I, year 1)	1.5	50	
	On-Job-Training (OJT)/Qualification Packs				
Radiology Technician (HSS/Q0201)		(Any one)	15	200	
5 Semester II	Theory				
	5.GV.05	Electronic Measurement and Instrumentation -II	3	50	
	5.GV.06	Basic Imaging	3	50	
	5.GV.07	Tools, Equipment & Safety Measures -II	3	50	

Level	Code	Educational Component	Credit	Marks
	5.GV.08	Soldering & De-Soldering of Components & Emergency actions II	3	50
	Lab/Practical			
	5.VP.03	Soldering & De-Soldering of Components-Lab	1.5	50
	5.VP.04	Basic Imaging practicals	1.5	50
	On-Job-Training (OJT)/Qualification Packs			
	To continue with the same QP as opted in Level 5 First semester		(Any one)	15
6 Semester I	Theory			
	6.GV.01	Fault analysis & Repairs	3	50
	6.GV.02	Cross Sectional Anatomy	3	50
	6.GV.03	Electronics Devices Circuit -I	3	50
	6.GV.04	Radiation and administrative Issues	3	50
	Lab/Practical			
	6.VP.01	Electronics Devices Circuit -I Lab	1.5	50
	6.VP.02	Fault analysis & Repairs - Lab	1.5	50
	On-Job-Training (OJT)/Qualification Packs			
Assistant Duty Manager - Patient Relation Services (HSS/Q6103)		(Any one)	15	200
6 Semester II	Theory			
	6.GV.05	CT and Ultrasound	6	100
	6.GV.06	Manufacturing & Quality Norms	3	50
	6.GV.07	Electronics Devices Circuit -II	3	50
	Lab/Practical			
	6.VP.03	Electronics Devices Circuit -II Lab	1.5	50
	6.VP.04	Manufacturing Practices	1.5	50
	On-Job-Training (OJT)/Qualification Packs			
To continue with the same QP as opted in Level 6 First semester		Any one)	15	200
7	Theory			
	7.GV.01	MRI, Image Processing and Recording	6	100

Level	Code	Educational Component	Credit	Marks
Semester I	7.GV.02	Advanced Imaging	6	100
	Lab/Practical			
	7.VP.01	MRI, Image Processing and Recording	1.5	50
	7.VP.02	Advanced Imaging	1.5	50
	On-Job-Training (OJT)/Qualification Packs			
	Duty Manager - Patient Relation Services (HSS/Q6104)	(Any one)	15	200
7 Semester II	Theory			
	7.GV.03	Admin, medico legal and interventional proc	6	100
	7.GV.04	Project	6	100
	Lab/Practical			
	7.VP.03	Admin, medico legal and interventional proc	3	100
	On-Job-Training (OJT)/Qualification Packs			
	(The practical and theory need to be performed in a hospital/radiological centre)			
	To continue with the same QP as opted in Level 7 First semester		15	200