WEST BENGAL STATE COUNCIL OF TECHNICAL EDUCATION

Proposed Syllabus for the Diploma in Medical Laboratory Technology

Part - III

(6th Semester)

[Modification of curriculum structure & syllabus of part-II and part- III of Diploma in Engineering Course]

March'2014

1. INSTALLATION, MAIMTENANCE OF MEDICAL EQUIPMENT

Course: Diploma in Medical Laboratory Technology		**Credit: 3**	
Subject of Study: **Installation, Maintenance of Medical Equipment**		Evaluation Scheme:	
Subject Code: MLT 601		Internal:	30
Subject Offered in : **DMLT Part-III 6th Semester**		TA: 10 + CT: 20	
Contact Periods: 3 L/ Week		ESE	70
Subject: **Theoretical** Duration: **17 weeks**		**Total Marks**	**100**

AIM:
1. To acquire the basic knowledge of Installation of medical Instruments
2. To be familiar with the Layout of installation site.
3. To acquire the basic knowledge Maintenance and Care of medical instruments
4. To acquire the basic knowledge requirements for the installation.

TEACHING SCHEME			
Teaching	15 weeks	45 Periods	45 Hrs
Internal Assessment	2 weeks	6 Periods	6Hrs
Total Contact Periods:	17 weeks	51 Periods	51 Hrs

END SEMESTER EXAMINATION SCHEME							
Sl. No	Questions	Group	From Unit	To be Set	To be Answered	Allotted Marks	Total Marks
1. a. b. c.	**Objective Questions** MCQ Fill in the blanks True/False		All	10 8 8	8 6 6	1 x 8 1 x 6 1 x 6	**20**
2. to 11	**Subjective Questions** (May have Part Marking)	A B C	1, 2, 3 4	3 4 3	**Any 5** at least Taking **one** From each Group	10 x 5	**50**
Grand Total							70

DETAIL SUBJECT CONTENT		
Unit	Topic	Contact Periods
1	**Electrical Power Supply:** Concept of single phase & three phase power supply system, Voltage, wattage, Earthing method, Open ground problem, Shielding, Electrical rules & regulation, switch, fuse, UPS	5
2	**Electrical Shock Hazard & safety :** Electrical Shock, Type of shock, Gross shock, Micro Shock, Let-go-current, Physiological effect of electrical shock, electrical safety, Prevention of shock, Isolation circuit, leakage current, code & regulation for the medical Instrument, Patient safety,	10
3	**Installation:** Checklist, Requirement for the installation of medical Instruments - Power , Room size, construction & others, drawing of Layout and Requirement for the installation of X-ray, USG, CT, MRI, Laboratory Instruments – colorimeter, Spectrophotometer, Semi analyzer, Auto-analyzer, Electrophoresis machine, ECG, EEG, EMG , Computed Spirometer etc.	15
4	**Maintenance:** Function of the instruments**,** Use of manual **,** maintenance, Troubleshooting –fault, possible cause, solution, Approach of fault analysis, Preventive maintenance& annual maintenance of different medical instruments such - X-ray, USG, CT, MRI, Laboratory Instruments – colorimeter, Spectrophotometer, Semi analyzer, Auto-analyzer, Electrophoresis machine, ECG, EEG, EMG , Computed Spiro meter, BP Instrument, Stethoscope etc.	15
TOTAL		45

Sl. No	Books	Author	Publisher
1	Medical Equipment Maintenance Management & Oversight	Binseng Wang	Morgan & Claypool Pub. Sr.
2	Servicing Biomedical Equipment	Elliott S. Kanter	
3	Medical Equipment Maintenance (Guidelines by Ministry of Health)		

REFERENCE BOOKS

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2. ADVANCED BIOMEDICAL ENGINEERING

Course: Diploma in Medical Laboratory Technology Subject of Study: **Advanced Biomedical Engineering** Subject Code: MLT 602 Subject Offered in : **DMLT, Part-III, 6th Semester** Contact Periods: 3 L+1TU / Week Subject: **Theoretical** Duration: **17 weeks**	**Credit: 3**	
	Evaluation Scheme:	
	Internal: TA: 10 + CT: 20	30
	ESE	70
	Total Marks	**100**

AIM:
1. To understand the basic concept of Biotelemetry
2. To acquire the basic knowledge of the different advanced medical instruments.
3. To acquire the basic knowledge to design the bio-amplifier and signal processing
4. To acquire the basic knowledge computer application in medical instrumentation system.

TEACHING SCHEME

Teaching	15 weeks	60 Periods	60 Hrs
Internal Assessment	2 weeks	8 Periods	8 Hrs
Total Contact Periods:	17 weeks	68 Periods	68 Hrs

END SEMESTER EXAMINATION SCHEME

Sl. No	Questions	Group	From Unit	To be Set	To be Answered	Allotted Marks	Total Marks
1. a. b. c.	**Objective Questions** MCQ Fill in the blanks True/False		All	10 8 8	8 6 6	1 x 8 1 x 6 1 x 6	**20**
2. to 11	**Subjective Questions** (May have Part Marking)	A	1, 2, 3	3	**Any 5** at least Taking **one** From each Group	10 x 5	**50**
		B	4, 5	3			
		C	6	3			
	Grand Total						70

DETAIL SUBJECT CONTENT

Unit	Topic	Contact Periods
1	**Biotelemetry:** Introduction to telemetry, Biotelemetry, need of Biotelemetry, With ware telemetry system, Wireless telemetry system, acquisition, Modulation, Demodulation, Single channel biotelemetry, Multi channel biotelemetry system, TDM, FDM,	10
2	**Automated Drug delivery System:** Infusion pump, Component of Drug infusion system, Implantable infusion system,	5
3	**Radiotherapy Equipment:** Principle of radiotherapy, Use of High voltage X-ray machine,	10

	Development of Betatron, Cobalt 60 machine, Medical Linear accelerator Machine, Safety protocols	
4	**LASER:** Principle operation of LASER, Overview of Nd-YAG, pulsed Ruby, CO_2 , He-Ne Laser and their applications, LASER in Surgery	10
5	**Design of Bio-amplifier and signal processing:** ECG amplifier, QRS detection, EMG amplifier, design of filters , Notch filter	10
6	**Application of Computer in Biomedical Engineering:** Microcomputer in Medical Instrument, interfacing computer with the medical Instruments, Application in Biomedical Engineering, Role of database in HIS, Need of networking, different hardware component, Component for networking, modality, Dicom, difference between common networking, PAC, Use of PAC, RIS	15
	TOTAL	60

REFERENCE BOOKS			
Sl. No	Books	Author	Publisher
1	Medical Instrumentation application & design	John G. Webster	Wiley
2	Biomedical Instrumentation	R. S. Khandpur	Tata Mc
3	Biomedical Instrumentation	Cromwell	
4	A text book of Medical Instrument	S. Ananthi	
5	Biomedical Instrumentation	Carr and Brown	
6	Hand book of Biomedical Engineering	Josep D. Bronzino	

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3. MICROPROCESSOR & MICROCONTROLLER

Course: Diploma in Medical Laboratory Technology Subject of Study: **Microprocessor & Microcontroller** Subject Code: MLT 603 Subject Offered in : **MLT Part-III 6th Semester** Contact Periods: 3 L+ 1TU / Week Subject: **Theoretical** Duration: **17 weeks**	**Credit: 3**

Evaluation Scheme:	
Internal: TA: 10 + CT: 20	30
ESE	70
Total Marks	**100**

AIM:
1. To study about the architecture of 8085 IC.
2. To study about the architecture of 8086 IC.
3. To develop the knowledge of assembly language programming for 8085 & 8086
4. To study about the interfacings of 8085 & their applications.

TEACHING SCHEME			
Teaching	15 weeks	60 Periods	60 Hrs
Internal Assessment	2 weeks	8 Periods	8 Hrs
Total Contact Periods:	17 weeks	68 Periods	68 Hrs

END SEMESTER EXAMINATION SCHEME							
Sl. No	Questions	Group	From Unit	To be Set	To be Answered	Allotted Marks	Total Marks
1.	**Objective Questions**						**20**
a.	MCQ		1 to 5	8	8	1 x 8	
b.	Fill in the blanks			6	6	1 x 6	
c.	True/False			6	6	1 x 6	

2.	**Subjective Questions**	A	1,2	3	Any 5 taking at	10 x 5	**50**
To	(May have Part Marking)	B	3	3	least one from		
10		c	4,5	2	each group		
	Total						70

	DETAIL SUBJECT CONTENT	
Unit	**Topic**	**Contact Periods**
1	**Introduction to Microprocessors :** Evolution of microprocessors; Specific features of microprocessors; Application of microprocessors	5
2	**Architecture of Microprocessors :** Explanation of each Functional Block Diagram and Internal Architecture of 8085,8086/8088 – ALU, Registers, Control unit, Clocks, Bus Structure; Address, Data and Control Bus of 8085, 8086/8088; pin Details of 8085, 8086/8088, Introduction to PC range of Microprocessors	12
3	**Programming of Microprocessors:** Different Addressing modes of 8085,8086/8088; Instruction Cycle of 8085,8086/8088 (including subroutine calls, jumping, comparing, string instructions of 8086); Timing Diagram of different parts of Instruction Cycles; Solving basic problems of Assembly Language Programming using 8085 Trainer Kit and Using any 8086 Assembler or DOS Debug Program.	16
4	**Interfacing of Memory and I/O Ports:** Address Space; Memory mapped I/O, I/O mapped I/O; address Decoding and Interfacing of Memory; DMA Description with sequence of steps and control flow, Structure of a generic DMA controller; programmer's model of 8251, Programmer's model of 8255 with its Interfacing; Outputting data to Parallel Port using 8086 Commands in DOS/WIN9x; Interrupts – Hardware and Software interrupts, A brief overview of BIOS Interrupts, An introduction to (i) Disk Access Interrupts (ii) CRT/Graphics Interrupts	12
5	**Single Chip Microcontroller:** Programming model of 8051: CPU – Address bus – Data bus – Control bus – Register – Internal RAM and ROM – Ports (serial and parallel) – Timers – Interrupts. ADDRESS MODES: Immediate – Register – Direct – Indirect – Indexed. INSTRUCTION TYPES: Arithmetic – Logical – Data Transfer (Internal/External) – Boolean. Control Transfer and Special Function Register	15
	Total	60

	REFERENCE BOOKS		
Sl. No	Books	Author	Publisher
1	Microprocessor	R.S.Gaonkar	Wiely Eastern
2	Microprocessor and Its applications	B.Ram	
3	Microprocessor & Digital System	D.V. Hall	TMG
4	The 8051 Microcontroller & Embeded System using Assembly and C (2nd Ed.)	Muhammad Ali Mazidi	Pearson
5	8051 Microntroller Architecture Programming and application	M. Mahalakshmi	

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4. I BIOMATERIALS (Elective)

Course: Diploma in Medical Laboratory Technology		**Credit: 3**	
Subject of Study: **Biomaterials (Elective)**		Evaluation Scheme:	
Subject Code: MLT 604-i		Internal: TA: 10+ CT: 20	30
Subject Offered in : **MLT Part-III 6th Semester**			
Contact Periods: 3 L + 1 TU / Week		ESE	70
Subject: **Theoretical**	Duration: **17 weeks**	**Total Marks**	**100**

AIM:
1. To introduce materials used in medical devices & prostheses
2. To know the basic properties of biomaterials
3. To be familiar biocompatibility

TEACHING SCHEME			
Teaching	15 weeks	60 Periods	60 Hrs
Internal Assessment	2 weeks	8 Periods	8 Hrs
Total Contact Periods:	17 weeks	68 Periods	68 Hrs

END SEMESTER EXAMINATION SCHEME							
Sl. No	Questions	Group	From Unit	To be Set	To be Answered	Allotted Marks	Total Marks
1. a. b. c.	**Objective Questions** MCQ Fill in the blanks True/False			 10 8 8	 8 6 6	 1 x 8 1 x 6 1 x 6	**20**
2. To 11	**Subjective Questions** (May have Part Marking)	A	1,2	3	Any 5 taking at least **one** from each group	10 x 5	**50**
		B	3	3			
		C	4,5	4			
		Total					70

DETAIL SUBJECT CONTENT		
Unit	Topic	Contact Periods
1	**Introduction:** Materials, definition of biomaterials, requirements of biomaterials, Classification of biomaterials, Some common biomaterials	6
2	**Property of Biomaterials:** Surface properties, Physical properties, mechanical properties of biomaterials, comparison of properties of some common biomaterials, Effect of Physiological fluid on the properties of biomaterials.	12
3	**Different Biomaterials:** overview of Metallic implant materials, Polymeric implant materials, Ceramic & composite materials and their uses	25
4	**Biocompatibility :** Definition of biocompatibility, blood compatibility, tissue compatibility, Toxicity test	7
5	**Sterilization of Biomaterials:** Autoclaving, gamma radiation, ETO, Effect of sterilization on materials	10
	Total	60

REFERENCE BOOKS			
Sl. No	Books	Author	Publisher
1	Biomaterials	Sujata vat	
2	Material Science	Calister	

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4.II TISSUE ENGINEERING (Elective)

Course: Diploma in Medical Laboratory Technology	Credit: 3	
Subject of Study: **Tissue Engineering (Elective)**	Evaluation Scheme:	
Subject Code: MLT 604-ii	Internal: TA: 10+ CT: 20	30
Subject Offered in : **MLT Part-III 6th Semester**		
Contact Periods: 3 L + 1 TU / Week	ESE	70
Subject: **Theoretical** Duration: **17 weeks**	**Total Marks**	**100**

AIM:
1. To introduce the organization of cell
2. To acquire the basic knowledge of cell culture
3. To be familiar with the molecular biology aspects
4. To introduce the concept of scaffolds & transplant.

TEACHING SCHEME			
Teaching	15 weeks	60 Periods	60 Hrs
Internal Assessment	2 weeks	8 Periods	8 Hrs
Total Contact Periods:	17 weeks	68 Periods	68 Hrs

END SEMESTER EXAMINATION SCHEME							
Sl. No	Questions	Group	From Unit	To be Set	To be Answered	Allotted Marks	Total Marks
1. a. b. c.	**Objective Questions** MCQ Fill in the blanks True/False		1 to 4	10 8 8	8 6 6	1 x 8 1 x 6 1 x 6	**20**
2. To 11	**Subjective Questions** (May have Part Marking)	A B C	1,2 3 4	3 3 3	Any 5 taking at least **one** from each group	10 x 5	**50**
Total							70

DETAIL SUBJECT CONTENT		
Unit	Topic	Contact Periods
1	**Introduction:** Basic definition, Structural and organizational of tissues – Epithelial, connective, vascularity and angiogenesis, basic wound healing, cell migration	5
2	**Cell Culture:** Different cell types, progenitor cells, cell differentiations, different kinds of matrix, cell-cell interaction, Aspect of cell culture	15
3	**Molecular Biology Aspect:** Cell signaling molecules, Growth factors, hormones and growth factors signaling, Growth factors delivery in the tissue engineering, Cell attachment, cell adhesion, receptor ligand binding and cell surface markers	20
4	**Scaffold and Transplant:** Biomaterials in tissue engineering, Degradable materials (collagen, silk and polylactic acid) , porosity, Mechanical Strength, Engineering tissue for replacing bone, cartilage, skin, liver, Basic transplant immunology, stem cell, hepatopoiesis	20
Total		60

Sl. No	Books	Author	Publisher
	REFERENCE BOOKS		
1	Principles of Tissue Engineering	Robert P Lanza, Robert Langer & William L. chick	Academic Press
2	The hand book of Biomedical Engineering	Josep D. Bronzino	CRC Press
3	Tissue Engineering	B. Palsson, J. A. Hubbel, R. Plonsey	CRC- Taylor & Francis

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4.III ARTIFICIAL ORGAN AND REHABILITATION ENGINGRING (Elective)

	Credit: 3	
Course: Diploma in Medical Laboratory Technology Subject of Study: **Artificial Organs and Rehabilitation Engg. (Elective)** Subject Code: MLT 604-iii Subject Offered in : **MLT Part-III 6th Semester** Contact Periods: 3 L + 1 TU / Week Subject: **Theoretical** Duration: **17 weeks**	Evaluation Scheme:	
	Internal: TA: 10+ CT: 20	30
	ESE	70
	Total Marks	**100**

AIM:
1. To introduce the different artificial organs and their uses
2. To introduce the tissue response to the artificial organs
3. To be familiar with rehabilitation engineering
4. To introduce rheological property of blood

TEACHING SCHEME			
Teaching	15 weeks	60 Periods	60 Hrs
Internal Assessment	2 weeks	8 Periods	8 Hrs
Total Contact Periods:	17 weeks	68 Periods	68 Hrs

END SEMESTER EXAMINATION SCHEME							
Sl. No	Questions	Group	From Unit	To be Set	To be Answered	Allotted Marks	Total Marks
1. a. b. c.	**Objective Questions** MCQ Fill in the blanks True/False		1 to 6	10 8 8	8 6 6	1 x 8 1 x 6 1 x 6	**20**
2. To 11	**Subjective Questions** (May have Part Marking)	A	1,2	3	Any 5 taking at least **one** from each group	10 x 5	**50**
		B	3, 4,5	3			
		C	6	3			
	Total						70

DETAIL SUBJECT CONTENT		
Unit	Topic	Contact Periods
1	**Introduction:** Introduction to artificial organs and prostheses, Biomaterials used, Tissue response- Inflammation, rejection, correction, Rheological properties of blood,	7

2	**Artificial Kidney:** Function of kidney, Brief of kidney filtration, Principle of hemodialysis, Artificial waste removal, Dialyzer, Overview of different types of hemodialysers – plate, coil, hollow fiber type,	10
3	**Artificial Heart-lung Machine:** Function of heart & lungs, Operation of Artificial heart-lung device, Oxygenator,	10
4	**Artificial Pancreas:** Basic principle of artificial pancreas, Introduction to artificial blood	8
5	**Audiometry:** Hearing mechanism, Basic principle of hearing aids,	10
6	**Rehabilitation Engineering:** Impairments, disabilities, handicaps, aids for blind, Rehabs for locomotion, Gait study, Artificial limbs and hand, prosthetic heart valves, Basic principle of Myoelectric controlled hand and arm prostheses, Dental Prostheses	15
	Total	60

REFERENCE BOOKS			
Sl. No	Books	Author	Publisher
1	Biomedical Instrumentation	R. s. Khandpur	Tata Mc
2	The hand book of Biomedical Engineering	Josep D. Bronzino	CRC Press
3	Rehabilitation Engineering	Robbinson C. J.	CRC press
4	Rehabilitation Engineering	Ballabio Betal	IOS press

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5. INSTALLATION, MAINTENANCE OF MEDICAL EQUIPMENT LAB.

Course: Diploma in Medical Laboratory Technology Subject of Study: **Installation Maintenance of Medical Equipment Lab.** Subject Code: MLT P605 Subject Offered in : **DMLT Part-III 6th Semester** Contact Periods: 3PR / Week Subject: **Practical** Duration: **17 weeks**	**Credit: 2**	
	Evaluation Scheme:	
	Internal:	25
	External Exam.	25
	Total Marks	**50**

AIM:
1. To acquire the basic knowledge of Installation of Medical equipments
2. To be familiar with the Layout
3. To be familiar with the requirements for the installation
4. To acquire the basic knowledge of the preventive and annual maintenance

EVALUATION SCHEME			
Sl. No	Assessment/ examination	Distribution of Marks	Total Marks
1	**Internal Assessment:** * Continuous Internal Assessment is to be carried out by the teacher throughout the semester	Experiment : 10 Attendance: 5 Lab. Report: 5 Viva Voce: 5	25
2	**External Examination:** * External Examination shall be held at the end of the semester * Each Student have to perform one Expt. allotted by lottery basis	On spot Experiment: 10 On spot Report: 5 Viva-Voce: 10	25
	Total		50

DETAIL SUBJECT CONTENT	
Sl. No	List of Experiments/ Jobs
1	Draw the layout for installation of ECG machine & Study of Specification and maintenance
2	Draw the layout for installation of EEG machine & Study of Specification and maintenance
3	Draw the layout for installation of X-Ray machine & Study of Specification and maintenance
4	Draw the layout for installation of USG machine & Study of Specification and maintenance
5	Draw the layout for installation of CT machine & Study of Specification and maintenance
6	Draw the layout for installation of MRI machine & Study of Specification and maintenance
7	Draw the layout for installation of Semi-analyzer & Study of Specification and maintenance
8	Draw the layout for installation of Auto-analyzer & Study of Specification and maintenance
9	Draw the layout for installation of Spectrophotometer & Study of Specification and maintenance
10	Draw the layout for installation of Electrophoresis & Study of Specification and maintenance

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6. <u>ADVANCED BIOMEDICAL ENGINEERING LAB.</u>

	Credit: 2	
Course: Diploma in Medical Laboratory Technology		
Subject of Study: **Advanced Biomedical Engineering Lab.**	Evaluation Scheme:	
Subject Code: MLT P606	Internal:	25
Subject Offered in : **DMLT Part-III 6th Semester**		
Contact Periods: 3PR / Week	External Exam.	25
Subject: **Practical** Duration: **17 weeks**	**Total Marks**	**50**

AIM:
1. To study the working principle of different therapeutic instrument and Medical Imaging Instrument
2. To identify the parts of the above instruments.
3. **To study of different biomedical instruments.**

EVALUATION SCHEME			
Sl. No	Assessment/ examination	Distribution of Marks	Total Marks
1	**Internal Assessment:** * Continuous Internal Assessment is to be carried out by the teacher throughout the semester	Experiment : 10 Attendance: 5 Lab. Report: 5 Viva Voce: 5	25
2	**External Examination:** * External Examination shall be held at the end of the semester * Each Student have to perform one Expt. allotted by lottery basis	On spot Experiment: 10 On spot Report: 5 Viva-Voce: 10	25
	Total		50

DETAIL SUBJECT CONTENT	
Sl. No	List of Experiments/ Jobs
1	Study of Telemetry system
2	Study of Infusion pump
3	Study of Bio-amplifier
4	Study of active filter for bio-signal.
5	Study of ADC for bio-signal
6	Interfacing of bio-signal with computer.
7	Study of PAC
8	Study of HIS

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7. <u>MICROPROCESSOR & MICROCONTROLLER **LAB.**</u>

Course: Diploma in Medical Laboratory Technology		**Credit: 2**	
Subject of Study: **Microprocessor & Microcontroller Lab.**		Evaluation Scheme:	
Subject Code: MLT P607		Internal:	25
Subject Offered in : **DMLT Part-III 6th Semester**			
Contact Periods: 3PR / Week		External Exam.	25
Subject: **Practical**	Duration: **17 weeks**	**Total Marks**	**50**
AIM:			

AIM:
1. To be familiar with the microprocessor & Microcontroller
2. To acquire the basic Microprocessor programming knowledge.
3. To be familiar with assembly language programming

EVALUATION SCHEME			
Sl. No	**Assessment/ examination**	**Distribution of Marks**	**Total Marks**
1	**Internal Assessment:** * Continuous Internal Assessment is to be carried out by the teacher throughout the semester	Experiment : 10 Attendance: 5 Lab. Report: 5 Viva Voce: 5	25
2	**External Examination:** * External Examination shall be held at the end of the semester * Each Student have to perform one Expt. allotted by lottery basis	On spot Experiment: 10 On spot Report: 5 Viva-Voce: 10	25
	Total		50
DETAIL SUBJECT CONTENT			
Sl. No	List of Experiments/ Jobs		
1	To be familiar with 8085-system development kit.		
2	To write, test and debug (if necessary) assembly and machine language programs using instruction set of 8085. A list of sample problems is given below.		
3	To practice on EPROM programming using SDK8085.		

4	To write programs to execute the following**: —**
	    a) display digits through seven-segment display using 8255.
	    b) rolling display-using 8255.
	    c) display hexadecimal digits using 8279.
	    d) development of a counter by 8255 and 8253.
	    e) developments of waveforms using 8255 and 8253.
	    f) receive on-line data through ADC and display.
	    g) develop interfacing program using DAC.		

5	To develop program to serve the interrupts of 8055 using SDK.		
6	To develop a keyboard interface using 8255.		
7	To practice assembly language programming with 8086 / 8088 using PC only.		
8	To practice programming with 8051SDK.		

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8. <u>PROJECT & ENTREPRENEURSHIP DEVELOPMENT</u>

Course: Diploma in Medical Laboratory Technology		**Credit: 4**	
Subject of Study: **Project & Entrepreneurship Development**		Evaluation Scheme:	
Subject Code: MLT P608		Internal:	25
Subject Offered in : **DMLT Part-III 6th Semester**			
Contact Periods: 6PR / Week		External Exam.	75
Subject: **Practical**	Duration: **17 weeks**	**Total Marks**	**100**

AIM:
1. To built up the creativity
2. To enhance the decision making capability
3. To face the problems and solution
4. To allow to do a job as their choice/interest
5. Project report preparation
6. Seminar presentation

Sl. No	EVALUATION SCHEME		
	Assessment/ examination	Distribution of Marks	Total Marks
1	**Internal Assessment:** * Continuous Internal Assessment is to be carried out by the teacher throughout the semester	performance : 10 Attendance: 5 Viva Voce: 10	25
2	**External Examination:** * External Examination shall be held at the end of the semester * Each Student have to demonstrate ppt	Project work: 20 Presentation: 20 Project Report: 10 Viva-Voce: 25	75
	Total		100

Sl. No	DETAIL SUBJECT CONTENT
	List of Experiments/ Jobs
1	Complete the project work and Submit the Project work with Project Report.
2	Seminar presentation on the Project work.
3	Viva on project work

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9. <u>GENERAL VIVA- VOCE</u>

Course: Diploma in Medical Laboratory Technology Subject of Study: **General Viva-Voce** Subject Code: MLT P609 Subject Offered in : **DMLT Part-III 6th Semester** Contact Periods: 6PR / Week Subject: **Practical** Duration: --	**Credit: 2**

Evaluation Scheme:	
Internal:	25
External Exam.	25
Total Marks	**50**

AIM:
1. To recapitulate the overall technical knowledge of the course
2. To prepare for the technical interview.

Sl. No	EVALUATION SCHEME		
	Assessment/ examination	Distribution of Marks	Total Marks
1	**Internal Assessment:** * Continuous Internal Assessment is to be carried out by the teacher throughout the semester	Viva Voce: 25	25
2	**External Examination:** * External Examination shall be held at the end of the semester	Viva-Voce: 25	25
	Total		50

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10. <u>PROFESSIONAL PRACTICE-IV (Seminar)</u>

Course: Diploma in Medical Laboratory Technology		**Credit: 1**	
Subject of Study: **Professional Practice-IV (Seminar).**		Evaluation Scheme:	
Subject Code: MLT P610		Internal:	50
Subject Offered in : **DMLT Part-III 6th Semester**			
Contact Periods:2PR / Week		External Exam.	-
Subject: **Practical**	Duration: **17 weeks**	**Total Marks**	**50**
AIM: 1. Develop the Soft skill 2. Application of different software in biomedical Engineering.			

EVALUATION SCHEME			
Sl. No	**Assessment/ examination**	**Distribution of Marks**	**Total Marks**
1	**Internal Assessment:** * Continuous Internal Assessment is to be carried out by the teacher throughout the semester	Performance: 20 Attendance: 10 Seminar Report: 10 Viva Voce: 10	50
	Total		50

DETAIL SUBJECT CONTENT	
Sl. No	**List of Experiments/ Jobs**
1	Seminar

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