Curriculum for Diploma in Medical Technology of Physiotherapy

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Curriculum for Diploma in Medical Technology of Physiotherapy

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Preface

With increasing public expectations about the health care services, specially in the emergency & pandemic situation like COVID 19 the quality of care itself is under scrutiny all over the world. Therefore a positive change is needed in the role of Medical Technologists. The role of teachers and students in teaching and learning to bring a positive changes in allied health professionals education also needs to be reviewed and further developed to make it more competency based.

This revised Health Technology (HT) competency based curriculum has been developed and scientifically designed, making it responsive to the needs of the learners and focussed towards the need of consumers and country. The present HT curriculum with its assessment methods is expected to effectively judge competencies acquired with those which are required to cater the health needs of our people. It is gratifying to note that all concerned in the promotion of allied health science in the country have involved themselves in the planning and formulation of this competency based & community oriented need-based curriculum.

Contents like basic computer science, communicative English, Ethics, communication skills, behavioural science, primary health care, environment and sanitation have been given the required emphasis in this document. Though the curriculum is not the sole determinants of the outcome, yet then it is very important as it guides the faculty members in preparing their instruction, tells the students where to go, what to do and what knowledge, skills and attitude they are expected to develop.

In conclusion, I would like to state that, the curriculum planning process should be continuous, dynamic and never-ending. If it is to serve best, the needs of the individual students, educational institutions and the expectations of people community to whom we are ultimately accountable, are required to be evaluated and given due attention.

I congratulate all who were involved in designing and developing the competency based curriculum, particularly the Director, CME, ADGs & Directors of DGME, Secretary, SMFB, members of the working group and the faculty members of Centre for Medical Education (CME). My special thanks to WR, WHO Bangladesh, Team Leader (Health System) & NPO (HRH) WHO Bangladesh for financial & technical support.

Professor Dr A.H. M. Enayet Hussain
Director General
Directorate General of Medical Education (DGME)

Foreword

Curriculum planning and designing is not a static process, rather a continuous process done regularly through a system. This curriculum was developed a few years back in 2008 but it was needed to be updated to make it more technology oriented students centred and competency based.

Initially there were policy level meetings and meeting of the Curriculum Working Group of different disciplines/courses from Institute of Health Technologies (IHT) to prepare a draft curriculum. Subsequently, in order to develop a consensus, decision was taken to hold Review Workshops through active participation of different groups of faculty members. A taskforce group examined the revised curriculum for the different courses of IHT to give it a final shape with the financial & technical support by WR, WHO Bangladesh & NPO (HRH) WHO Bangladesh.

The revised Curriculum for Health Technology (HT**)** is expected to be implemented for the newly admitted students of the next session. The success of this curriculum, which is made more competence based and need-based, depends on its proper implementation with active leadership of the MOH&FW, DGME, SMFB, principals & teachers of IHT with interactive participation of students.

It is expected that this curriculum will serve as present day guideline for the students of IHT and its faculty members. In order to ensure further improvement, this curriculum needs constant review and revision with time to time updating.

My sincere thanks to Prof Dr A.H. M. Enayet Hussain, Director General, DGME, for his guidance & supervision with his team of DGME. My special thanks to Dr. Bardan Jung Rana, WR, WHO Bangladesh, Dr Sangay Wangmo, Team leader (Health System) & Mr Md Nuruzzaman, NPO (HRH), WHO Bangladesh country office for financial & technical support for this activity. I like to thank Professor Dr. Md. Humayun Kabir Talukder, Professor (Curriculum Development & Evaluation), Centre for Medical Education (CME), working co-ordinator, IHT Curriculum Development Committee for his continuous technical assistance and co-ordination to prepare this curriculum. The technical team comprising the faculty members of the Centre for Medical Education (CME) deserve special appreciation.

Lastly, I would like to extend my deep and sincere gratitude to all principals & teachers of different IHTs, subject experts, faculty members and others computer and secretarial support staff of CME who shared their expertise and worked hard to produce this valuable document.

Professor Dr Syeda Shahina Subhan
Director
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Acknowledgement

This is indeed a pleasant responsibility to bring out this curriculum on Diploma in Health Technology course, which has been developed through a participatory approach by a team of policy teachers of IHTs and medical educationists. It aims to review and update the Health Technology (HT) curriculum.

I would like to express my deep gratitude to Prof Dr A.H. M. Enayet Hussain, Director General, DGME, for his overall supervision in this activity along with ADG (Admin), ADG(Education) & Directors of DGME, under the leadership of whom the plan of reviewing and updating the IHT curriculum has been materialized, and who provided immense support and encouragement to finish the work. My cordial thanks are extended to Dr Sangay Wangmo, Team leader (Health System) & Mr Md Nuruzzaman, NPO (HRH), WHO Bangladesh country office for financial & technical support for this activity.

I am grateful to all the resource persons/teachers from different institutes, subject experts, principals of IHT specially the faculty of Center for Medical Education (CME), who devoted their immense efforts, time and hard work to develop this curriculum. My special thanks to Professor Dr. Md. Humayun Kabir Talukder, Professor (Curriculum Development & Evaluation), Centre for Medical Education (CME), working co-ordinator, IHT curriculum reviewing & updating committee for his continuous efforts without which it would not have been possible to complete this work. My thanks to all other faculty members & staffs of CME, who were involved directly or indirectly in preparation of this curriculum.

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List of Content

Course Overview

Course Aims:

To prepare Medical Technologists (Physiotherapy) with proper explained knowledge, skill and attitude to bring about behavioural changes for enabling them to perform assigned responsibilities of Medical Technologists in Physiotherapy departments of health institutes like hospitals, rehabilitation centre, health complexes, clinics and physiotherapy centre to achieve the desired goal.

Course Objectives:

A. *General*

After successful completion of the 3 years Diploma course in Medical Technology (Physiotherapy), the students will be able to:

- Demonstrate sound and adequate explained knowledge and activities related to Physiotherapy.
- Develop skills on operating and maintaining the different physiotherapy equipments and accessories.
- Develop skills on maintaining of essential documentation related to physiotherapy.
- Understands the hazards of handling the physiotherapy instruments and their protective measure.
- Supervise physiotherapeutic activities.
- Contribute to the future development and plan of physiotherapeutic activities in Bangladesh.

B. *Specific*

- Analyse and assess physical and relevant psychosocial factors of patients need from a physiotherapeutic perspective.
- Synthesise explained knowledge and assessment findings in order to identify treatment objectives.
- Evaluate the effectiveness of the total procedure and way the therapeutic programme as necessary to meet revised objectives according to patients' progress.
- Plan a therapeutic programme which permits achievement of therapeutic objectives.
- Promote positive good health and prevent disease and disability.
- Inform the public and other members of the health care team about the role and scope of physiotherapy.
- Demonstrate values and attitudes consistent with high standards of ethical and professional conduct.
- Maintain and develop educational and therapeutic skill on a life long basis.
- Contribute to the future development of physiotherapy.

Course Details

A. Course Title: Diploma in Medical Technology (Physiotherapy)

B. Course philosophy and rational

The course of physiotherapy will help to develop skill manpower in the field of physiotherapy. The Medical Technologists in Physiotherapy will play a vital role in helping the disabled and handicapped people.

C. Conditions for entrance:

1. Qualifications & prerequisite:
   - (i) SSC Science or equivalent with Science with Physics, Chemistry and Biology.
   - (ii) Candidate has to secure required grade point in the SSC examinations which will be decided by the concern competent authority.
   - (iii) Candidate passed SSC examination in current Year and previous 3rd Year is illegible for admission or as decided by the authority for each year of admission.

D. Examinations for Entrance/Admission Test:

All candidates are to sit for admission tests through prescribed rules and examination method as specified in the advertisement. Selection of the candidates will be done on merit basis as based on marks obtained in the admission test.

Despite the general merit in consideration for selection the reserved quota for different groups of applicants as specified in the advertisement shall be maintained on the merit basis for the respective reserved quota as well. Candidates selected for admission will have to appear before the Medical Boards as organized by the respective Institute of Health/ Medical Technology.

Course structure and duration

Total duration of the course will be 4 years

The course will be of four years' duration. The total period is divided into 4 parts-1st year, 2nd year, 3rd year and 4th year. In each there will be 40 weeks of teaching and learning at the end of which there will be a year final examination. Supplementary examinations will be held 6 months of the year final examination.

Year	Duration
1st Year	12 months
2nd Year	12 months
3rd Year	12 months
4th Year	12 months

NB: All academic activities including yearly faculty examination of each phase must be completed within the specified time of the phase.

NB: Total duration for completion of the four years (4) course will be 07 years after admission in 1st year

E. Distribution of the papers with teaching /learning hour's as per year wise:

1st Year

Exams	Papers	Subjects	Lecture (in hours)	Tutorial (in hours)	Institutional Academic Lab based Practical Training/ Demonstration (in hours)	Formative Exam		Summative exam		Total Hours
						Preparatory leave	Exam time	Preparatory leave	Exam time	
Teaching-learning both formative & summative assessment	I	English	66	34	-	7 days	10 days	10 days	15 days	100
	II	Basic Human Anatomy	70	60	70					200
	III	Basic Human Physiology	75	60	65					200
	IV	Basic Community Medicine & Behavioral science	150	50	-					200
	V	Basic computer science	25	-	75					100
		Total	**395**	**195**	**210**	**17 days**		**25 days**		**800**
		Grand total	**800 hours**			**42 days**				**800 hours**

2nd year

Exams	Papers	Subjects	Lecture (in hours)	Institutional Academic Lab based Practical Training/ Demonstration (in hours)	Formative Exam		Summative exam		Total Hours
					Preparatory leave	Exam time	Preparatory leave	Exam time	
Teaching-learning both formative & summative assessment	I	Physics	40	30	7 days	10 days	10 days	15 days	70
	II	Chemistry	80	20					100
	III	Basic Microbiology & Parasitology	80	20					100
	IV	Kinesiology	100	150					250
	V	Therapeutic Exercise	100	200					300
		Total	**370**	**450**	**17 days**		**25 days**		**820**
		Grand total	**820 hours**		**42 days**				**820 hours**

3rd year

Exams	Papers	Subjects	Lecture (in hours)	Institutional Academic Lab based Practical Training/ Demonstration (in hours)	Formative Exam		Summative exam		Total Hours
					Preparatory leave	Exam time	Preparatory leave	Exam time	
Teaching-learning both formative & summative assessment	I	Electrotherapy and Hydrotherapy	100	150	7 days	10 days	10 days	15 days	250
	II	Physiotherapy in Medical Conditions	100	150					250
	III	Physiotherapy in Surgical conditions	100	150					250
		Total	**300**	**450**	17 days		25 days		750
		Grand total	**750 hours**		**42 days**				**750 hours**

4th Year

Exams	Papers	Subjects	Lecture (in hours)	Institutional Academic Lab based Practical Training/ Demonstration (in hours)	Special attachment at relevant lab based advance training (in hours)	Formative Exam		Summative exam		Total Hours
						Preparatory leave	Exam time	Preparatory leave	Exam time	
Teaching-learning both formative & summative assessment	I	Physiotherapy in special Medical Condition	100	150	150	7 days	10 days	10 days	15 days	400
	II	Clinical practice and professional ethics	100	150	150					400
		Total	**200**	**300**	**300**	17 days		25 days		**800**
		Grand total	**800 hours**			**42 days**				**800 hours**

F. Teaching & learning methods, media and faculty members

The following teaching and learning methods will be followed:

1. Large Group Teaching Lecture aided by –
   - Multimedia
   - Computer
   - Chalk board
   - OHP/ Slide projector
   - Handouts

2. Small Group Teaching-
   - Tutorial/ Demonstration
   - Students interaction

3. Practical session-
   - Use of practical manual Chalk board
   - Performing the task/examination by the student
   - Writing the practical note book
   - Log book

4. Lab Placement-
   - In small groups for performing activities by the student themselves

5. Faculty members-
   - Subject oriented teacher (Professor/ Associate professor/ Assistant professor/Lecturer/Instructor will be illegible to perform lecture/theoretical class.
   - Subject oriented instructors will be illegible to perform practical/demonstration class.

G. Assessment

- Examination will be held on month of January & July of every year.

Assessment Methods:

- There will be in-course/formative (card/ item) and end-course/summative (terminal) assessment for the students in each part (1^{st}, 2^{nd}, 3^{rd} & 4^{th} year) of the course i.e. formative and year final examination.
- There will be year final examination at the end of each academic year and one supplementary examination 6 months after each regular year-final examination.
- Formative assessment will be done through items and cards ending exam.

In the year-final examination marks allocation will be as follows:

- 50% from year-final written examination
- 10% from the formative examinations (Card final examination/Item marks).
- 40% from the oral and practical examinations.
- In written assessment Short Answer Question (SAQ) and Multiple choice question (MCQ)-true/false, in practical along with traditional objective structure practical examination (OSPE) & in oral structure oral examination (SOE) will be utilized

Eligibility for appearing in the year-final examination:

- Certificate from the respective head of institutes regarding students obtaining at least 75% attendance in all aspects (theory, practical, tutorial, residential field practice) during one academic year.
- Obtaining at least 50% marks in the formative examinations.
- No objection Certificate from the respective head of institutes regarding taking part any activities contrary to the discipline of the institute.
- No student shall be allowed to appear in the Year II, Year III and Year IV Final examinations unless the student passes all the subjects of 1st, 2nd and 3rd year Final examinations respectively.

Carry on

- One can be eligible to attend the classes of 2nd year after passing at least 3 subjects among 5 subjects of 1st year.
- One can be eligible to attend the classes of 3rd year after passing at least 3 subjects among 5 subjects of 2nd year.
- One can be eligible to attend the classes of 4th year after passing at least 2 subjects among 3 subjects of 3rd year.

Assessment personnel:

- Subject oriented teacher (Professor/ Associate professor/ Assistant professor/Lecturer will be illegible to be an examiner, moderator and able to evaluate the examination script.
- Subject oriented instructors will be illegible to undertake the practical examinations

Grading

Numerical percentage of Marks	GPA letter Grade	GPA Numerical Grade (Grade points)
85% and above	A^+	4
81% to less than 85%	A	3.75
76% to less than 80%	A^-	3.5
71% to less than 75%	B^+	3.25
66% to less than 70%	B	3.00
61% to less than 65%	B^-	2.75
Only 60%	C	2.50
Less than 60%	F	0

Pass Marks/Grade-C
Written Exam - 60%
Practical - 60%
Oral - 60%

Student shall have to pass written, oral, practical and formative separately in each paper of the examination.

Results will be publish in GPA system and number of the subjects will be reflected in the academic transcript.

H. Examinations & distribution of marks as per each year

1st Year Examination

Paper	Subjects	Written Exam	Oral Exam	Practical Exam	Formative Exam	Total Marks
I	English	75	15	-	10	100
II	Basic Anatomy	100	40	40	20	200
III	Basic Physiology	100	40	40	20	200
IV	Basic Community Medicine & Behavioral Science	100	40	40	20	200
V	Basic computer science	50	--	40	10	100
	Total	**425**	**135**	**160**	**80**	**800**

2nd Year Examination

Paper	Subjects	Written Exam	Oral Exam	Practical Exam	Formative exam	Total Marks
I	Physics	75	10	15	--	100
II	Chemistry	75	10	15	--	100
III	Basic Microbiology & Parasitology	100	40	40	20	200
IV	Kinesiology	100	40	40	20	200
V	Therapeutic Exercise	100	40	40	20	200
	Total	**450**	**140**	**150**	**60**	**800**

3rd Year Examination

Paper	Subjects	Written Exam	Oral Exam	Practical Exam	Formative exam	Total Marks
I	Electrotherapy and Hydrotherapy	100	40	40	20	200
II	Physiotherapy in Medical Conditions	100	40	40	20	200
III	Physiotherapy in Surgical conditions	100	40	40	20	200
	Total	**300**	**120**	**120**	**60**	**600**

4th Year Examination

Paper	Subjects	Written Exam	Oral Exam	Practical Exam	Formative exam	Total Marks
II	Physiotherapy in special Medical Condition	100	40	40	20	200
II	Clinical practice and professional ethics	100	40	40	20	200
	Total	**200**	**80**	**80**	**40**	**400**

I. This curriculum is meant for the guidance of four groups for people --

- Students to guide them in what to learn and how to learn
- Teachers to guide them in what to teach and how to teach
- Examiners to guide them in what to evaluated and how to evaluated
- Concerned policy persons to guide how to implement this curriculum with proper--
  - Governance
  - Guidelines

- Faculty members with updated organogram
- Institutional academic lab
- Attached OPD
- Special lab attachment as per future job
- Appropriate students friendly academic environment
- Teachers to be oriented about the implementation of curriculum
- Log book to be prepared

J. Required faculty members of the concerned subject/discipline are as follows to implement this curriculum --

- Professor……..... 1
- Associate Professor..... 1
- Assistant Professor..... 2
- Lecturer..... 3
- Instructor..... 4
- Technologist..... 5

1st Year
Paper I: Subject - English

Total hours: 100 hour
Lecture: 66 hour
Practical / Tutorial: 34 hours

Total marks-100
Written-75
Oral & practical- 15
Formative 10

Objectives:

At the end of the course the students will be able to: -

- read & write any story in English and attain HSC level English proficiency
- show proficiency in English grammar (article, tense, voice, phrases & idioms)
- write letters in English (private, Official etc).
- translate & retranslate in English
- read and write essays on different topics in English
- develop listening skills in English
- communicate with each other in English
- read and write laboratory reports/findings in English
- follow written and oral instructions in English of the seniors/authorities

List of Competencies

Ability to--

- write Paragraph, Letter, Application & report in English
- show skill in reading, writing ,listening & Conversations in English
- understand & interpret any reports or manuals in English
- read & write any story in English and attain HSC level English proficiency
- write letters in English (private, Official etc.).
- translate & retranslate in English
- read and write essays on different topics in English
- develop listening skills in English
- communicate with each other in English

Course Contents of English (Part -I) ***Marks = 50***

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	**Tutorial**
1.	**Text book: English for Today-Published by N.C.T.B. (Intermediate)** **Unit- Three: Learning English.** 1. Learning a language 2. Why to learn English 3. How to learn English 4. Different learners, different ways 5. Dealing with grammar 6. Integrated skills development 7. How to use dictionary **Unit-Six: Our Environment.** 1. The environment and the ecosystem 2. How the environment is polluted. 3. The world is getting warmer. 4. Let's not be cruel to them. 5. Beware of pollution. 6. Forests should stay. 7. How to manage waste. **Unit-Twenty-four: People, People Everywhere** 1. What's the problem? 2. Kalim Majhee's boat. 3. The rootless. 4. Why is there discrimination? 5-7. The Revenge.	16	

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Tutorial
2.	**Grammar:** **Articles :** ▪ Indefinite & definite articles **Tense:** ▪ Present, Past & Future tense **Voice :** ▪ Active voice ▪ Passive voice ▪ Voice change **Speeches:** ▪ Direct speeches ▪ Indirect speeches **Linkers** ▪ In addition ▪ Besides ▪ Moreover ▪ However ▪ Because ▪ Either or , neither nor **Idioms & Phrases :** **Subjects & predicate** **Parts of speech-** ▪ Noun & its classification ▪ Pronoun & its classification ▪ Adjective & its classification ▪ Verb-Adverb **Conjugation** **Preposition** **Punctuation (**capitalization, fragment, end, comma, semi colon, colon, hyphen, underlining**)** **Spelling** **Wrong words** **Translation** (Bengali to English, English to Bengali), short story writing, technical description, comprehension.	22	
	Paragraph writing : **Letter writing:** **Application writing:** **Report writing :**	10	
	Telegrams & E-mail:	2	

Course Contents of English (Part -II) ***Marks = 25+25***

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	**Tutorial**
	Communicative English : ▪ Reading skill ▪ Writing skill ▪ Listening skill ▪ Conversations skill	 4 4 4 4	 8 8 8 10
	Total	66	34

Teaching Methods:

Lecture
Practical/ Tutorial/Communication

Media:

Multi media,
Laptop,
OHP,
White Board/marker
Black board/ chalk
Wall chart
VCD, DVD, CD

Assessment:

Written – SAQ -75 marks
Reading, Listening & conversation-15 marks
Formative -10 marks

Paper II : Subject - Basic Anatomy

Total hours: 200 hours **Total marks-200**
Lecture: 70 hours **Written-100**
Tutorial : 60 hours **Oral-40**
Practical/Demons: 70 hours **Practical- 40**
Formative- 20

Objectives:
At the end of the course the students will be able to: -

- acquaint with the anatomical terminologies
- demonstrate a comprehensive knowledge base about the major anatomical organ, system and structure of human body
- identify major anatomical organ, system and structure of human body
- identify the specific structures and organs and application of such knowledge in studying their individual disciplines.
- do surface marking of important organ of human body.

List of Competencies:
Ability to--

- demonstrate a comprehensive knowledge base about the major anatomical organ, system and structure of human body
- identify major anatomical organ, system and structure of human body
- identify the specific structures and organs and application of such knowledge in studying their individual disciplines.
- do surface marking of important organ of human body.

Course Contents of Basic Anatomy

Sl. No	Topics/Lessons	Teaching/learning Hours		
		Lecture	Tutorial	Practical/ Demonstration
1.	**Introductory Anatomy :** **a)** Anatomical Terminologies : i) Definition of Anatomy ii) Anterior, Posterior, superior, inferior, medial, lateral & median plane. **b)** i) Systems of Human body ii) Human cell: structure and classification. iii) Cell division: types. Phases of mitosis iv) Tissue: Types of tissues.	10	05	10
2.	**Musculoskeletal system:** ▪ component ▪ Types of bones & joints ▪ short description of important bones	10	10	05
3.	**Cardio-vascular system.** ▪ Location & Basic structure of cardiovascular system ▪ Short description of heart, major arteries, capillaries/veins	10	05	10
4.	**Respiratory system** ▪ Basic structure of respiratory system ▪ Description of larynx, trachea, bronchi, bronchioles and alveoli ▪ Gross Anatomy of lung	06	06	10

Sl. No	Topics/Lessons	Teaching/learning Hours		
		Lecture	Tutorial	Practical/ Demonstration
5.	**Gastro-intestinal and Hepatobiliary system:** ▪ Short description of the different parts of alimentary system: mouth, tongue, esophagus, stomach, small and large intestine, rectum & anal canal ▪ Anatomy of salivary glands, pancreas, liver, gall bladder	10	10	10
6.	**Genito –urinary system:** ▪ Anatomy of urinary system ▪ Male genital system: ▪ Female genital system	10	10	10
7.	**Nervous system and Endocrine system.** ▪ Basic structure of nervous system ▪ Parts of nervous system and short description of brain, spinal cord, cranial nerves, peripheral nerves ▪ Autonomy of nervous system and short description of sense organs-eye, ear, nose, throat, tongue and skin ▪ Important endocrine glands	12	12	10
8.	**Lymphatic System :** ▪ Anatomy of lymph nodes and vessels	02	02	05
	Total	70	60	70

Teaching Methods:

Lecture
Tutorial
Practical/ Demonstration

Media:

Multimedia,
Laptop,
OHP,
White Board/Marker,
Black/board
Skeleton
Wall chart
Microscope

Assessment:

Written – SAQ= 80 marks, MCQ=20 marks
Practical or OSPE 40 marks, Oral-40 marks, Formative-20 marks

Paper III : Subject - Basic Physiology

Total hours: 200 hours
Lecture:75 hours
Tutorial: 60
Practical: 65

Total marks-200
Written-100
Oral -40
Practical- 40
Formative- 20

Objectives:

At the end of the course the students will be able to: -

- Demonstrate a comprehensive knowledge on functional aspects of different important components, organs and systems of human body.

- Apply the practical knowledge of human physiology in studying and performing the allotted tasks in their individual discipline.

List of Competencies

- Ability to demonstrate a comprehensive knowledge on functional aspects of different important components, organs and systems of human body.

- Ability to apply the practical knowledge of human physiology in studying and performing the allotted tasks in their individual discipline.

Course Contents of Basic Physiology

Sl. No	Topics/Lessons	Teaching/learning Hours		
		Lecture	Tutorial	Practical/ Demonstration
1.	**Introductory Physiology:** ▪ Physiological terminologies ▪ Basic structure and organizations of human body ▪ Cell physiology and metabolism/multiplication of living cells ▪ General functions of different systems of the body: Musculoskeletal/Respiratory/ Circulatory/Digestive/Urinary/Nervous/ Endocrine/Immune/ Reproductive	10	04	10
2.	**Musculoskeletal system :** ▪ Physiological components of musculoskeletal system ▪ Functions of important muscles, bones & joints of human body ▪ Movements of joints	10	10	05
3.	**Cardiovascular System:** ▪ Functions of circulatory system ▪ Composition of Blood and their Functions ▪ Conductive system of heart & Cardiac cycle ▪ Physiology of Blood Pressure	10	05	10

Sl. No	Topics/Lessons	Teaching/learning Hours		
		Lecture	Tutorial	Practical/ Demonstration
4	**Respiratory system :** ▪ Functions of respiratory system ▪ Mechanism of breathing	05	05	10
5	**Digestive and hepatobiliary system:** ▪ Definition of digestion, absorption, metabolism ▪ Digestion, absorption & metabolism of carbohydrate, fat & protein ▪ Nutritional deficiency disorders : anemia, iodine deficiency, vitamin deficiencies ▪ Functions of liver, pancreas and gall bladder ▪ Composition & functions of different digestive juices & bile	10	10	10
6	**Genitourinary system:** ▪ Functions of Kidney ▪ Formation, appearance and composition of urine ▪ Functions of reproductive organs of both sexes: uterus/ovary/fallopian tube/vagina/ penis/testes/scrotum/vas deferens/prostate	10	10	10
7	**Nervous system, organs of special sense:** ▪ Functions of motor, sympathetic & parasympathetic nervous system ▪ Functions of cranial nerves ▪ Cerebrospinal fluid formation, composition & function ▪ Functions of special sense organs-eye, ear, nose, tongue and skin ▪ Functions of the endocrine glands & hormones secreted by them: Pituitary / thyroid / parathyroid / adrenal /gonads/pancreas/placenta	12	10	10
8	**Immune System :** ▪ Definition/classification and components of immune system ▪ Cells and tissues of immune system & their functions	05	05	
9	**Lymphatic System :** ▪ Structure & functions of lymph nodes and vessels	03 05	01	
	Total	75	60	65

Teaching Methods: Lecture, Tutorial, Practical/ Demonstration

Media:

Multimedia, Laptop, OHP, White Board/Marker, Black board/chalk, Wall chart, Lab. Reagent & Apparatus, Microscope

Assessment:

Written – SAQ= 80 marks, MCQ=20 marks

Practical or OSPE 40 marks, Oral-40 marks, Formative-20 marks

Paper IV : Subject – Basic Community Medicine & Behavioural Science

Total hours: 200 hour
Lecture: 150 hour
Practical / Tutorial: 50 hours

Total marks-200
Written-100
Oral-40
Practical- 40
Formative- 20

Objectives

At the end of the course the students will be able to: -

- describe the general aspects of community medicine
- describe the basic concepts of epidemiology
- explain the concept of primary health care
- define organizations of health services and major health program in Bangladesh
- carry on elementary bio-statistics
- describe the concept of Demography and Family Planning
- define Maternal and Child Health (MCH), describe its objectives and explain the importance of ante-natal and post-natal care for mother and children
- define food and nutrition and be aware of nutritional problems in Bangladesh
- acquaint themselves with occupational health hazards and their preventive and protective measures
- describe the principles of health education and their application in the community
- acquaint themselves with environmental pollution and methods of prevention and control of pollution
- explain the basic concept of Essential Service Package (ESP)

List of Competencies:

Ability to --

- describe the general aspects of community medicine
- describe the basic concepts of epidemiology
- explain the concept of primary health care
- define organizations of health services and major health program in Bangladesh
- carry on elementary bio-statistics
- describe the concept of Demography and Family Planning
- define Maternal and Child Health (MCH), describe its objectives and explain the importance of ante-natal and post-natal care for mother and children
- define food and nutrition and be aware of nutritional problems in Bangladesh
- acquaint themselves with occupational health hazards and their preventive and protective measures
- describe the principles of health education and their application in the community
- acquaint themselves with environmental pollution and methods of prevention and control of pollution
- explain the basic concept of Essential Service Package (ESP)

Course Contents of Basic Community Medicine

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Practical/ Demonstration
1.	**Introductory community medicine:** ▪ Definition of Community Medicine ▪ Concept of health : Definition / Dimensions / Spectrum / Determinants / Indicators ▪ Concept of general principles for prevention and control of communicable and Non-communicable diseases ▪ Concept of health promotion: Definition / Interventions	16	10
2.	**Primary health care:** ▪ Definition/Elements/ Principles/Scope	05	02
3.	**Health care services and organization:** ▪ Primary/Secondary/Tertiary Health Care services ▪ WHO/UNDP/UNICEF/CARE/ International Red Crescent / BIRDEM / ICDDR,B	06	02
4.	**Basic Epidemiology:** ▪ Definition /Aims/Methods/Scope ▪ Definition of epidemiological terms eg. Epidemic/Endemic/Pandemic/Sporadic/ Zoonotic disease/ Incubation period/ period of communicability/ Epidemiological Triad/ Infection/ Contamination/ Infestation etc. ▪ Major health programs in Bangladesh ▪ Medical Information system (MIS)	12	06
5.	**Basic Bio-statistics :** ▪ Definition /Scope/Functions/Importance and uses of Biostatistics, Medical statistics, Health statistics, Vital statistics ▪ Definition of vital events ▪ Definition/types/characteristics/functions/importance/sources/collection and presentation of data ▪ Morbidity/Mortality/Fertility statistics	17	04

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Practical/ Demonstration
6.	**Demography and family planning**. ▪ Demography: Definition/Focus/Process/Stages/Cycle and how to conduct census ▪ Family Planning: Definition/ Objectives/ Scope/Health aspects/Benefits ▪ Contraceptive methods: Short description /Advantages/Disadvantages/Indications/ Contraindications/ Complications	12	04
7.	**Maternal and Child Health Care (MCH):** ▪ Introduction/Definition/Aims & Objectives / Components of MCH ▪ Maternal health care: Antenatal/Intra natal/Postnatal ▪ Care of the New-born/Under 5 children ▪ Indicators of MCH care: MMR, IMR etc	10	
8.	**Food and nutrition:** ▪ Food: Definition/Functions/Classification ▪ Sources/types/functions/daily requirements and deficiency of protein, fat, carbohydrate, vitamins and minerals ▪ Definition of nutrition /Balanced Diet ▪ Malnutrition: Definition/Forms/Causes and prevention ▪ Common nutritional problems of Bangladesh: low Birth Weight/Protein Energy Malnutrition/ Nutritional Blindness/ Nutritional Anemia/ Lathyrism	15	06
9.	**Occupational Health :** ▪ Occupational health : Definition /Objectives ▪ Occupational Hazards: Introduction /Types ▪ Occupational diseases: Definition/Classification/Prevention and control	08	02
10.	**Health education behavioral science and Ethics:** ▪ Health Education: Definition/Importance / Objectives / Components/ Principles/Methods /Media ▪ Communication Skills: Definition/Key elements /Barriers ▪ Behavioral Science : Introduction & concept ▪ Ethics: Introduction and concept	12	04

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Practical/ Demonstration
11.	**Environment and sanitation:** ▪ Definition of environment, pollution, sanitation and environmental sanitation ▪ Water: Safe wholesome water/Source of water/water pollution/Hazards of water pollution /water borne diseases/Hardness of water/ Purification of water ▪ Air : Definition/Composition ▪ Air pollution : Sources, pollutants, indicators, health & other effects, prevention & control ▪ Ventilation: Definition/Standards/ Types/ Criteria of good ventilation / effects of good ventilation ▪ Solid waste: Definition/Types/Sources/Health hazards ▪ Disposal of solid waste: Dumping/Controlled tipping or sanitary land fill/ incineration/ composting/Manure pits/Burial ▪ Excreta or night soil: Public health importance/Health hazards/how disease occurs from it/Sanitation Barrier/ Methods of excreta disposal (Unsewered area/Sewered area)	25	04
12.	**First Aid :** ▪ Definition / Principles of First Aid ▪ First Aid Box-List of contents and their uses ▪ First Aid of : Cuts, bleeding, burn, shock, dog bite, snake bite	12	06
	Total	150	50

Teaching Methods:

Lecture
Tutorial
Practical/ Demonstration

Media:

Multi media, Laptop, OHP, White Board/Marker,
Black board/chalk
Wall chart
Models & Samples

Assessment:

Written – SAQ= 80 marks, MCQ=20 marks
Practical or OSPE 40 marks, Oral-40 marks, Formative-20 marks

Paper V : Subject - Basic Computer Science

Total hours: 100 hour
Lecture: 25 hour
Practical / Tutorial: 75hours

Total marks-100
Written-50
Practical- 40
Formative-10

Objectives:
At the end of the course the students will be able to: -

- acquaint with the modern computer technology
- start**,** Shutdown and restore the windows
- open, close & edit the file
- develop skills in ms word, ms-excel, power point, internet
- create chart, graph , tables etc.
- install different programs & software
- prepare reports of various investigations
- do internet browsing & other applications of internet

List of Competencies
Ability to--

- deal with the modern computer technology
- show skills in ms word, ms-excel, power point
- prepare reports of various investigations
- internet browsing & other applications of internet

Course Contents of Basic Computer Science

Sl No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Tutorial/ Practical
1.	**Detailed Contents :** **Relevant Instruction for Practical :** ▪ Information Technology -its concept and scope ▪ Computers for information storage, information seeking, information processing and information transmission ▪ Elements of computer system - computer hardware and software: data -numeric data, numeric data; contents of program, processing ▪ Computer organization, block diagram of a computer, CPU, memory ▪ Input devices; keyboard, mouse etc; output devices; VDU and Printer, scanner, Plotter ▪ Electrical requirements, inter-connections between units, connectors and cables ▪ Secondary storage; magnetic disks-tracks and sectors, optical disk (CD and DVD Memory), primary and secondary memory: RAM, ROM, PROM etc. ▪ Capacity; device controllers, serial port, parallel port system bus 47 ▪ Exercises on file opening and closing; memory management; device management; device management and input-output (I/O) management with respect of windows ▪ Installation concept and precautions to be observed while installing the system and software ▪ Introduction about Operating systems such as and Windows ▪ Special features, various commands of MS word and MS- Excel, Power -point ▪ About the internet-server types, connectivity (TCOP/IP, shell); applications of internet like: e-mail and browsing ▪ Various Browsers like WWW (World wide web); hyperlinks; HTTP (Hyper Text Transfer Protocol); FTP (File Transfer Protocol) ▪ Basic of Networking -LAN, WAN, Topologies	25	
	▪ Give a PC, name its various components and list their functions ▪ Identification of various parts of a computer and peripherals ▪ Practice in installing a computer system by giving connection and loading the system software and application software ▪ Installation of DOS and simple exercises on TYPE, REN, DEL, CD, MD, COPY, TREE, BACKUP commands ▪ Exercises on entering text and data (Typing Practice) ▪ Installation of Windows 98 or 2000 etc. ▪ Features of windows as an operating system ▪ Start ▪ Shutdown and restore ▪ Creating and operating on the icons ▪ Opening, closing and sizing the windows ▪ Using elementary job commands like-creating, saving, modifying, finding and deleting a file ▪ Creating and operating on a folder ▪ Changing setting like, date, time color (back ground and fore ground) ▪ Using short cuts ▪ Using on line help		

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Tutorial/ Practical
	▪ MS-WORD ▪ File Management Opening, creating and saving a document, locating files, copying contents in some different file (s), protecting files, Giving password protection for a file ▪ Page set up : Setting margins, tab setting, ruler, indenting ▪ Editing a document : Entering text, Cut, copy, paste using tool-bars ▪ Formatting a document : Using different fonts, changing font size and color, changing the appearance through bold/italic/underlines, highlighting a text, changing case, using subscript and superscript using different underline methods ▪ Aligning of text in document, justification of document, Inserting bullets and numbering : ▪ Formatting paragraph, inserting page breaks and column breaks ▪ Use of headers, footers: Inserting footnote, end note, use of comments ▪ Inserting date, time, special symbols, importing graphic images, drawing tolls ▪ Tables and Borders Creating a table, formatting cells, use of different border styles, shading in tables, merging of cells, partition of cells, inserting and deleting row in a table ▪ Print preview, zoom, page set up, printing options ▪ Using Find, Replace options ▪ Using Tools like: Spell checker, help, use of macros, mail merge, word content and statistics, printing envelops ▪ Using shapes and drawing toolbar ▪ Working with more than one window in MS Word, ▪ How to change the version of the document from one window OS to another ▪ Conversion between different text editors, software and MS word		30

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Tutorial/ Practical
	MS -Excel : ▪ Starting excel, open worksheet, enter, edit, data, formulas to calculate values, format data, create chart, printing chart, save worksheet, switching from another spread sheet ▪ **Menu Commands :** Create, format charts, organize, manage data, solving problem by analyzing data, exchange with other applications. Programming with MS Excel, getting information while working ▪ **Work Books :** Managing workbooks (create, open, close, save) working in work books, selecting the cells, choosing commands, data entry techniques, formula creation and links, controlling calculations, working with arrays ▪ Editing a worksheet, copying, moving cells, pasting, inserting, deleting cells, rows, columns, find and replace text, numbers of cells, formatting worksheet **:** ▪ **Creating a chart :** Working with chart types, changing data in chart, formatting a chart, use chart to analyze data ▪ **Using a list to organize data, sorting and filtering data in list** ▪ **Retrieve data with MS -Query: Create a pivot table, customizing a pivot table. Statistical analysis of data.** ▪ **Customize MS-Excel:** How to change view of worksheet, outlining a worksheet, customize workspace, using templates to create default workbooks, protecting work ▪ **Exchange data with other application: linking and embedding, embedding objects, linking to other applications, import, export document**		20
	Power Point : ▪ Making Slide following the rules & principles ▪ Slide Projection		10
	Internet and its Applications : ▪ Log -in to internet ▪ Navigation for information seeking on internet ▪ Browsing and down loading of information from internet ▪ Sending and receiving e-mail ▪ Creating a message ▪ Creating and address book ▪ Attaching a file with e-mail message ▪ Receiving a message ▪ Deleting message		15
	Total=	**25**	**75**

Teaching Methods:

Lecture
Practical

Media:

Computer
Multi media
Computer lab.
Internet connection
White Board
Marker

Assessment:

Written – SAQ- 50 marks
Oral and Practical – 40 marks
Formative – 10 marks

2nd Year

Paper I : Subject - Physics

Total hours: 70 hour
Lecture : 40hour
Practical/Tutorial: 30 hours

Total marks -100
Written – 75
Oral -10
Practical - 15

Objectives:
At the end of the course, the students will be able to-

- define Physics and state the importance of Physics in the Health Care System.
- describe the different systems of measurement and weights.
- demonstrate basic knowledge on measurement of density and specific gravity of a substance.
- demonstrate basic knowledge on fundamental aspects of heat and temperature, sound, light, electricity and magnetism.

List of Competencies:
Ability to

- define Physics and state the importance of Physics in the Health Care System.
- describe the different systems of measurement and weights.
- demonstrate basic knowledge on measurement of density and specific gravity of a substance.
- demonstrate basic knowledge on fundamental aspects of heat and temperature, sound, light, electricity and magnetism.

Course Contents of Physics

Sl.No	Topic/Lessons তত্ত্বীয়	Teaching/Learning Hours	
		Lecture	Practical
১।	**বলবিদ্যা ও পদার্থের ধর্ম ঃ** ➢ সরল রেখার গতি, গতির সমীকরণ, নিউটনের গতির সূত্র ত্বরণ ও বল, খাত বল, ভেকটর ও সেলের রাশি। ➢ কৌণিক গতি, কৌণিক বেগ ও ত্বরণ বৃত্তাকার পথে গতি, কেন্দ্রভিগ বল। ➢ কাজ, ক্ষমতা ও শক্তি, শক্তির সংরক্ষণ নীতি। ➢ সরল দোল গতি, সরল দোলক ➢ আর্কিমিডিসের সূত্র ও তার প্রয়োগ আপেক্ষিক গুরুত্ব নির্ণয়।	০৮ ঘন্টা	
২।	**তাপ ঃ** তাপমিতি, তাপের একক, আপেক্ষিক তাপ, তাপীয় ক্ষমতা পানিসমও সুপ্ততাপ এবং ইাহাদের নির্ণয় পদ্ধতিঃ সরলীয় পদ্ধতিতে তাপের পরিবাহিতা নির্ণয়।	৫ ঘন্টা	
৩।	**শব্দ ঃ** ➢ শব্দের উৎপত্তি ও শব্দ সালন, আড় তরঙ্গ ও দীঘল তরঙ্গ শব্দের ব্যভিচার ও বীট। বীটের সাহায্যে কম্পন সংখ্যা নির্ণয়। ➢ শব্দের বেগ নির্ণয়। ➢ টানা তারের আড় কম্পন, সূত্রের প্রমাণ।	৫ ঘন্টা	

৪।	**আলোক ঃ** ➢ গোলীয় পৃষ্ঠে প্রতিফলন। ➢ সমতল ও গোলীয় পৃষ্ঠে প্রতিফলন। সম্পূর্ণ প্রতিফলন, প্রতিসরাংক, প্রিজম প্রতিসারণ। ➢ লেন্সঃ উত্তল ও অবতল লেন্স। লেন্সের শক্তি ও বিবর্ধন লেন্স সংযোজন। চোখের ত্রুটি সমূহ ও প্রতিকার। ➢ আলোক যন্ত্র-মাইক্রোস্কোপ।	৫ ঘন্টা	
৫।	**চুম্বক ঃ** ➢ চুম্বকনের বিভিন্ন পদ্ধতিঃ চুম্বকের মতবাদ, চুম্বকের ক্ষেত্র ও প্রবাল্য। বিপরীত বর্গীয় সূত্র প্রান্তমূখী ও প্রষ্ঠমূখী অবস্থানে চুম্বকের প্রাবল্য। বিক্ষেপী চুম্বকমান যন্ত্র ও ইহার ব্যবহার। ➢ ভুচুম্বকত্ব।	৪ ঘন্টা	
৬।	**তড়িৎ ঃ** ➢ স্থির তরিৎ, চার্জের অস্তিত্ব ও প্রকৃতি নির্ণয়। বৈদ্যুতিক আবেশ, কুলম্বের সূত্র, ধারকত্ব, তড়িৎ বিভব। সমান্তরাল পাত ধারক। ➢ বিদ্যুৎ কোষ, তাদের কেন্দ্রে উৎপন্ন চুম্বকক্ষেত্র। বিদ্যুৎ প্রবাহ ও চার্জের একক। ➢ ওহমের সূত্র, বিভব বৈষম্যের একক। রোধ ও আপেক্ষিক রোধ, রোধের একক, রোধ সংযোজন, এমিটার, ভোল্ট মিটার। ➢ বৈদ্যুতিক পরিমাপ, হুইট স্টোম ব্রিজ, মিটার ব্রিজ, পোস্ট অফিস বক্স ও পাটেন শিও মিটার। ➢ তড়িৎ প্রবাহ ও উত্তাপ, জুলের সূত্র, বৈদ্যুতিক পদ্ধতিতে নির্ণয়। ➢ তড়িৎ প্রবাহে রাসায়নিক ক্রিয়া, তড়িৎ বিশেষণ, সূত্র ও ইহাদের প্রমাণ। ➢ তড়িৎ চুম্বকীয় আবেশ।	১৩ ঘন্টা	
	ব্যবহারিক	৪০	

Sl.No	**Topic/Lessons**	**Teaching/Learning Hours**	
		Lecture	**Practical**
৭।	**১। স্লাইড ক্যালিপার্স, স্ক্রুজ ও স্পেরোমিটারের ব্যবহার শিক্ষা।**		৩ ঘন্টা
	২। পানি অপেক্ষা হালকা/ভারি তরল ও কঠিন পদার্থের হাইডো-স্টেটিক ব্যালেন্স, নিকলসন হাইড্রেমিটার ও আঃ হাইড্রো বোতলের সাহায্যে আপেক্ষিক গুরুত্ব নির্ণয়।		৩ ঘন্টা
	৩। সরল দোলকের সাহায্যে জি এর মান নির্ণয়।		৩ ঘন্টা
	৪। একটি ক্যালরিমিটারের সাহায্যে পানিসম নির্ণয়।		২ ঘন্টা
	৫। কঠিন ও তরলের আপেক্ষিক তাপ নির্ণয়।		৩ ঘন্টা
	৬। অবতল দর্পনের ফোকাস দুরত্ব নির্ণয়।		২ ঘন্টা
	৭। প্যারালাক্স পদ্ধতিতে উত্তল লেন্স ফোকাস দুরত্ব নির্ণয়।		২ ঘন্টা
	৮। একখানা কাচ ফলকের প্রতিসরাংক নির্ণয়।		৩ ঘন্টা
	৯। ওহমের সূত্রের সত্যতা নির্ণয়।		৩ ঘন্টা
	১০। যে কোন দৈর্ঘের তারে আপেক্ষিক রোধ নির্ণয়।		৩ ঘন্টা
	১১। নাল পদ্ধতিতে দুইখানা দন্ড চুম্বকের চৌম্বক ভ্রামকের তুলনা।		৩ ঘন্টা
	মোট ঃ ৭০ ঘন্টা	৪০	৩০

মান বন্টন ঃ তত্বীয় = ৬০

১। পদার্থের সাধারণ ধর্ম, আলোক ও তড়িৎঃ প্রতিটি শাখা থেকে ৮ নম্বরের দুটি ও ৪ নম্বরের ২টি করে মোট (৬টি + ৬টি)= ১২টি প্রশ্ন আকারে। তন্মধ্যে ৮ নম্বরের ১টি করে ৩ শাখায় ৩টি ও ৪ নম্বরের ১টি করে ৩ শাখার ৩ টি অর্থাৎ মোট ৬টি প্রশ্নের উত্তর দিতে হবে।

8 x 1x 3 = 24
4 x 1x 3 = 12

২। শব্দ ও তাপ ও চুম্বকতত্বঃ প্রতিটি শাখা থেকে ৪ নম্বরের ৪টি করে মোট ১২টি প্রশ্ন থাকবে। সেগুলোর মধ্যে থেকে ২টি করে মোট ৬টি প্রশ্নের উত্তর দিতে হবে।

4 x 2x 3 = 24

দ্রষ্টব্যঃ বলবিদ্যা ও পদার্থের ধর্ম থেকে ও অন্য যে কোন শাখা থেকে ১টি পরীক্ষণ করতে হবে।

ব্যবহারিকঃ ক্লাস রেকর্ড ৯+১ নং ও ২নং পরীক্ষণ ৮ করে = ১৫ মার্কস
মৌখিক ও ফরমেটিভ = ১০, লিখিত = ৭৫ মার্কস
মোট ঃ তত্বীয়+ব্যবহারিক+মৌখিক = ১০০ মার্কস

Paper II: Subject - Chemistry

Total hours: 100 hour
Lecture : 80 hour
Practical/Tutorial: 20 hours

Total marks -100
Written – 75
Oral - 10
Practical - 15

Objectives:
At the end of the course, the students should be able to:

- describe fundamentals in physical chemistry.
- explain common laboratory process.
- identify organic and inorganic chemical compounds.
- describe the different aspects of metals, non-metal and gaseous substances.

List of Competencies:
Ability to--

- describe fundamentals in physical chemistry.
- explain common laboratory process.
- identify organic and inorganic chemical compounds.
- describe the different aspects of metals, non-metal and gaseous substances.

Course contents of Chemistry

Sl.No	Topic/Lessons	Teaching/Learning Hours	
		Lecture	Practical
	গ্রুপ -ক ভৌত রসায়ন		
	১। ভৌত ও রাসায়নিক পরিবর্তন ও এদের মধ্যে পার্থক্য।	১ ঘন্টা	
	২। পদার্থের গঠনঃ অণু ও পরমানু-অণুর সংজ্ঞা, আন্তঃআণবিক দুরত্ব, আন্তঃআণবিক, কঠিন, তরল, গ্যাস, পরমানু, পারমানবিক ও আনবিক ওজন।	৫ ঘন্টা	
	৩। সাধারণ পরীক্ষাগার প্রণালীঃ দ্রবণ, অভিস্রবণ, পরিস্রাবণ ও অতিপৃক্ত দ্রবণ, দ্রাব্যতা, বাষ্পীভবন, পাতন, আংশিক পাতন, উর্ধ্বপাতন, কেলাসন।	৪ ঘন্টা	
	৪। প্রতীক, সংকেতঃ প্রতীক, আনবিক সংকেত, যোজ্যতা, রেডিক্যাল এবং তাদের যোজনী, যোজনী থেকে আনবিক সংকেত নির্ণয়, গাঠনিক সংকেত।		
	৫। রাসায়নিক বিক্রিয়াঃ বিভিন্ন প্রকারের রাসায়কি ক্রিয়া, রাসায়নিক বিক্রিয়া ঘটানোর উপায় সমূহ।	৪ ঘন্টা	
	৬। অম্ল, ক্ষারক ও লবন।		
	৭। গ্যাসের ধর্ম-বয়েলের সূত্র, চার্লসের সূত্র।	৪ ঘন্টা	
	৮। মৌলের রাসায়নিক তুল্যাংক বা যোজন ভার।	২ ঘন্টা	
	৯। পরমানুর গঠন এবং যোজ্যতার ইলেকট্রনীয় মতবাদ।	২ ঘন্টা	
	বিভিন্ন রাসায়নিক বন্ধন।	২ ঘন্টা	
	১০। ক) এভোগ্যাড্রে সূত্র খ) ভরক্রিয়া সূত্র।	৪ ঘন্টা	
	১১। রাসায়নিক সংযোগ বিধিঃ	২ ঘন্টা	
	ক) ভরের নিত্যতা সূত্র। খ) নির্দিষ্ট অনুপাত সূত্র।	৫ ঘন্টা	
	গ) গুনানুপাত বিধি। ঘ) বিপরীত অনুপাত সূত্র।		
	ঙ) গ্যাস আয়তন সূত্র।		
	গ্রুপ -খ অধাতু ঃ		

Sl.No	Topic/Lessons	Teaching/Learning Hours	
		Lecture	Practical
	১। নিম্নোক্ত পদার্থ গুলোর উৎস, প্রস্তুতি, ধর্ম এবং ব্যবহারঃ	৭ ঘন্টা	
	ক) অক্সিজেন, ওজোন, পানি ও হাইড্রোজেন পার অক্সাইড।		
	খ) হোলাজেন সমূহ ঃ ক্লোরিন, রোমিন, আয়োডিন ও হাইড্রো ক্লোরিক এসিড।		
	গ) নাইট্রোজেন, হাইড্রোজেন সালফাইট, সালফার ডাইঅক্সাইড।		
	ঘ) সালফার, হাইড্রোজেন সালফাইট, সালফার ডাইঅক্সাইড, সালফিউরিক এসিড।		
	ঙ) ফসফরাস চ) জারন-বিজারনঃ জারক ও বিজারক পদার্থ		
	২। ধাতুঃ নিম্নোক্ত পদার্থ গুলোর উৎস, প্রস্তুতি, ধর্ম এবং ব্যবহারঃ		
	ক) সোডিয়াম-সোডিয়াম হাইড্রোঅক্সাইড, সোডিয়াম কার্বনেট, সোডিয়াম ক্লোরাইড।	৬ ঘন্টা	
	খ) ক্যালসিয়াম-ক্যালসিয়াম কার্বনেট, ক্যালসিয়াম ক্লোরাইড, ক্যালসিয়াম সালফেট, বি-চিং পাউডার।	১ ঘন্টা	
	৩। কপার -কপার অক্সাইড, কপার সালফেট, কপার ক্লোরাইড	১ ঘন্টা	
	৪। জিংক - জিংক অক্সাইড, জিংক ক্লোরাইড, জিংক সালফেট।		
	৫। এলুমিনিয়াম - এলুমিনিয়াম ক্লোরাইড, এলুনিয়াম সালফেট।	১ ঘন্টা	
	৬। আয়রন - আয়রন সালফেট।	১ ঘন্টা	
	৭। লেড - লেড অক্সাইড।	১ ঘন্টা	
	৮। সিলভার - সিলভার নাইট্রেট।	১ ঘন্টা	
	গ্রুপ - গ জৈব রসায়ন		
	১। জৈব রসায়নের সংজ্ঞা, জৈব ও অজৈব যৌগের মধ্যে পার্থক্য জৈব যৌগের গঠন, শ্রেণী বিভাগ, কার্যকরী বা ক্রিয়াশীল মূলক।	৪ ঘন্টা	
	২। জৈব যৌগের নিষ্কাশন ও বিশুদ্ধকরণ	১ ঘন্টা	
	৩। সম্পৃক্ত ও অসম্পৃক্ত হাইড্রোকার্বনঃ প্রস্তুত প্রণালী, ধর্ম এবং ব্যবহার -মিথেন, ইথেন, ইথিলিন, এসিটাইলিন।	২ ঘন্টা	
	৪। এলকোহল হ্যালোজেন জাতকঃ মিথাইল ক্লোরাইড, ক্লোরোফর্ম এর প্রস্তুতি, ধর্ম ও ব্যবহার।	৪ ঘন্টা	
	৫। এলকোহলঃ শ্রেণী বিভাগ, মিথাইল এলকোহল, ইথানল এলকোহল ও গিসারিনের প্রস্তুতি, ধর্ম ও ব্যবহার।	২ ঘন্টা	
	৬। ডাই-ইথাইল ইথারঃ প্রস্তুতি, ধর্ম ও ব্যবহার।	১ ঘন্টা	
	৭। এলডিহাইড ও কিটোল সমূহঃ নিম্নলিখিত যৌগসমূহের প্রস্তুতি, ধর্ম ও ব্যবহার, ফরমালড্রিহাইড, এসিটালডিহাইড ও এসিটোন।	৩ ঘন্টা	
	৮। কার্বলিক এসিডঃ এসেটিক এসিড ও সাইট্রেক এসিসেডর প্রস্তুতি, ধর্ম ও ব্যবহার।	৩ ঘন্টা	
	৯। এলকোহল এ্যামাইনঃ এ্যামাইনের শ্রেণী বিভাগ, মিথাইল এ্যামাইন ও ইথাইল এ্যামাইনের প্রস্তুতি, ধর্ম ও ব্যবহার।	২ ঘন্টা	
	১০। এ্যারোমেটিক যৌগঃ নিম্নলিখিত যৌগসমূহের প্রস্তুতি, ধর্ম ও ব্যবহার। বেনজিন, টলুইন, ফ্লোরোবেজিন নাইট্রোবেজিন, অ্যানিলিন, কার্বলিক এসিড, বেনজালডিহাইড, বেনজোয়িক এসিড ও স্যালিসাইলিক এসিড।	৪ ঘন্টা	
	ব্যবহারিক ঃ		
	১। অম্ল ও ক্ষারের মাত্রা নির্ণয়।		২০ ঘন্টা
	২। হাইড্রোজেন ও অক্সিজেনের প্রস্তুতি।		
	৩। সহজ জৈব ও অজৈব যৌগের আঙ্গিক বিশেষণ।		
	মোট ঃ ১০০ ঘন্টা	৮০ ঘন্টা	২০ ঘন্টা

মান বন্টন ঃ লিখিত পরীক্ষা=৭৫ মার্কস, ব্যবহারিক = ১৫মার্কস, মৌখিক/ফরমেটিভ =১০ মার্কস

গ্রুপ - ক- ২০ নম্বর

গ্রুপ - খ - ২০ নম্বর

গ্রুপ - গ - ২০ নম্বর

গ্রুপ -ক থেকে ৩টি, গ্রুপ -খ থেকে ৩টি এবং গ্রুপ -গ থেকে ৩টি মোট ৯টি প্রশ্ন থাকবে। তন্মধ্যে প্রত্যোক গ্রুপ থেকে অন্ততঃপক্ষে ২ টি করে মোট ৬টি প্রশ্নের উত্তর দিতে হবে।

Paper III: Subject - Basic Microbiology & Parasitology

Total hours: 100-hour
Lecture: 80 hour
Practical: 20 hours

Total marks-200
Written-100
Oral-40
Practical- 40
Formative- 20

Learning objectives:

At the end of the course the students will be able to –

- Define and classify microorganisms, define and explain microbiological terminologies.
- Identify, use and maintain microbiological articles, equipment, apparatus including microscope and mention parts when applicable.
- Clean, wash, decontaminate, disinfect & sterilization microbiological articles, instruments, glass wares etc.
- Define, classify, and mention morphology of bacteria, virus, fungus, parasite and helminth.
- Name medically important bacteria, virus, fungus, parasite, helminth and diseases caused by them.
- Explain anatomy bacteria and bacterial spores: pathogenicity of medically important bacteria, growth & multiplication of bacteria.
- Identify, staining and culture medically important bacteria.
- Mention knowledge about PPE
- Demonstrate basic knowledge of immunity.

List of Competencies:

1. demonstrate basic knowledge on common microbiological and parasitological issues.
2. perform identification of different microorganisms particularly bacteria & fungus of medical importance ensuring laboratory safety using microbiological, reagents, equipment and apparatus.
3. provide best services to the stakeholders using the knowledge and skills.

Course Contents of Basic Microbiology & Parasitology

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture / Tutorial on Theories	Practical/ Demonstration/Field visit
1.	**Introduction to microorganisms:** ▪ Definition and classification of microorganisms ▪ Microbiological terminology ▪ Characteristics of Eukaryotic prokaryotic & sub cellular groups of microorganisms ▪ Microbiological articles, equipment's apparatus ▪ Microscope: Different parts of microscope, & maintenance of microscope	08	03
2.	**Destruction of microorganism:** ▪ Cleaning, Washing, decontamination disinfection & procedures ▪ Sterilization of different laboratory articles, instruments, glass wares etc.	07	03
3.	**Bacteria:** ▪ Anatomy of Bacteria, chemical composition of different structures of bacteria ▪ Bacterial Spore: Definition & function spores, Spores bearing bacteria of medical importance ▪ Bacterial toxin: Definition & types of bacterial toxin, characteristics of endotoxin & exotoxin, Toxin producing organism of medical importance, use of bacterial toxins in diseases prevention ▪ Biology of bacteria: Growth & multiplication of bacteria, bacteria growth curve, bacteria growth requirements. Definition & classification of culture media ▪ Classifying bacteria in terms of morphology, staining, spore, flagella, capsule & Pathogenicity. ▪ Staining bacteria: Gram's staining, AFB staining, Albert staining	15	04
	Virus: ▪ General characters of virus ▪ Morphology & classification of virus ▪ List of viruses of medical importance & diseases produced by them	10	01

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture / Tutorial on Theories	Practical/ Demonstration/Field visit
	Fungus: ▪ General character, Morphology and classification of fungus ▪ List of fungus list medical important and the diseases produced by them	10	02
	Parasite: ▪ Definition /Classification of parasite	03	01
	Helminth: ▪ General characteristics of helminths ▪ Classification /Morphology of helminths	08	02
	Protozoa: ▪ General characteristics of protozoa ▪ Definition /Classification of protozoa	10	02
	PPE: ***Personal protective equipment*** (***PPE***) for different healthcare activities	04	01
	Immunity: **Basic Concept of immunity and immunization Schedule.**	05	01
	Total	**80**	**20**

Teaching Methods:

- Lecture
- Tutorial
- Practical/ Demonstration
- Field visit

Media:

- Multimedia and Laptop
- OHP and transparencies
- White Board and markers
- Blackboards and chalk
- Online and computer based teaching learning materials
- Laboratory: (Microscope, Autoclave, Hot Air Oven, Incubator, Haemocytometer, Haemoglobin meter, Analytical balance, Centrifuge machine, Rotator, Refrigerator, Photometer, Electrolyte analyzer, Electrophoresis apparatus, ELISA reader, PCR machine, Cell counter etc.)
- Hospital/ Health complex

Assessment:

Written – SAQ= 80 marks, MCQ=20 marks
Practical or OSPE 40 marks, Oral-40 marks, Formative-20 marks

Paper IV : Subject- Kinesiology

Total hours: 250 hours
Lecture : 100 hours
Practical : 150 hours

Total marks : 200
Written : 100
Oral : 40
Practical : 40
Formative : 20

Objectives:

At the end of the course the students should be able to:

- explain the basic theory of movement
- demonstrate gross movement of different joints of the body.
- describe the utility and uses of the equipment used in the process of kinesiology.
- narrate how to make splints and its use in the correction of deformity.
- describe how to train the lower limb amputation with artificial limb.
- demonstrate the care of the splints, artificial limbs and other techniques used in the process of rehabilitation.

List of competencies

Kinesiology study help individuals cope with physical injuries and also work to manage, rehabilitate, and prevent disorders that impede movement. They demonstrate proper muscle movements to ward off further sprains and injuries.

The profile describes competencies across five domains – knowledge, kinesiology practical expertise, professionalism/professional practice, communication and collaboration, and professional development.

- **Knowledge**

1. Apply knowledge of anatomy, physiology, biomechanics and psychomotor learning/neuroscience to human movement and performance.
2. Apply knowledge of human movement and performance as it relates to health promotion, and to the prevention and treatment of chronic and other diseases and injury.
3. Apply knowledge of psychological and sociological factors that may influence/impact individuals and populations.
4. Demonstrate an understanding of how growth, development, and aging impact human movement and performance.
5. Demonstrate an understanding of how chronic diseases and conditions impact and limit functional capacity.
6. Demonstrate an understanding of ergonomics as it relates to human movement and performance.

- **Kinesiology practical expertise**

1. Recognize and select appropriate assessments or tools based on factors including but not limited to case history, contraindications, patient/client presentation, context, and reason for assessment.
2. Complete appropriate physical demands analysis.
3. Perform physical assessment procedures including but not limited to vital signs, anthropometrics, range of motion, strength, balance, cardiopulmonary fitness, and orthopaedic assessment.
4. Demonstrate understanding of the appropriate use of ergonomic assessments and tools.
5. Perform appropriate functional assessments of movement and performance.
6. Able to understand, evaluate and interpret assessment findings and referral documentation to form a clinical impression.

- **Professionalism/professional practice**

1. Demonstrate understanding of and comply with the Regulations on Standards, Guidelines, Code of Ethics, and Professional Misconduct.
2. Recognize and address conflicts of interest.
3. Act in the best interest of the patient/client.
4. Practice within limits of own professional knowledge, competence, and skill set.
5. Understand when to make referrals to the appropriate healthcare provider(s), other service providers, and/or programs.
6. Apply safety techniques and procedures (for example, use universal precautions, follow emergency procedures, ensure a safe work environment).
7. Practice in a manner that respects diversity and avoids prejudicial treatment of any specific population group.
8. Facilitate patient/client access to services and resources.
9. Respect patient's/client's rights to reach decisions about treatment and/or services.

- **Communication and collaboration**

1. Able to communicate and collaborate effectively as a member of a multidisciplinary team.
2. Able to communicate with empathy and appropriate language with patients/clients.
3. Able to communicate effectively with other stakeholders, including but not limited to third party payers, legal representatives, governmental entities, and community resources.
4. Able to effectively deliver education to patients/clients.
5. Able to use counselling skills and interviewing techniques with patients/clients.
6. Able to advocate for the health and wellness of patients/ clients.

- **Professional development.**

1. Develop and enhance own competence and demonstrate commitment to self-evaluation and lifelong learning.
2. Conduct regular self-assessments of professional development needs required to ensure ongoing competence.
3. Ensure safe practice and maintain fitness to practice.
4. Able to utilize best practice guidelines, including the interpretation and application of current, evidence-based knowledge.

- **Services**

1. Able to counsel patients/clients regarding healthy behaviours and lifestyle management.
2. Demonstrate understanding of therapeutic modalities and treatment applications used to optimize rehabilitation, including but not limited to ice, heat, exercise, taping, transcutaneous electrical nerve stimulation, and ultrasound.
3. Able to provide customized exercise prescription for healthy individuals, including but not limited to flexibility; strength, endurance, balance, and cardiopulmonary training; and corrective movement patterning.
4. Able to monitor, re-assess, and adjust prescriptions/treatment plans based on patient/client responses.
5. Able to make recommendations for task and/or job modification and accommodation based on assessment of the demands of the workplace, and evaluate effectiveness.
6. Able to collect and objectively evaluate data on the effectiveness of programs and services.

Demonstrate an understanding of ergonomics as it relates to human movement and performance.

Course contents of Kinesiology

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Practical/ Clinical Placement
1	Fundamental concepts: ❑ Starting positions/ Centre of gravity/ Planes of axes & of movements/Lever	08	12
2	Fundamental principles of movement: ❑ Anatomical and physiological movement	05	10
3	Fundamental principles of force and work force	05	10
4	Joints: Definition/Classification/Structure/Functions/Range of movements of all joins	05	10
5	The mascular system: ❑ Definition/ Classification ❑ Action of muscles in moving joints ❑ Muscular attachment/ Types of muscular contraction ❑ Pully action of the joint muscles	08	10
6	Neuromascular function: Motor unit/ Muscle tone/ All or No principle/ Ballistic movements	05	10
7	The spinal column	05	12
8	Movement of the thorax in respiration: Articulation/ Muscles/ Movements	05	05
9	The Upper extremities: The shoulder joints & ligaments/ Movements The elbow joints , radio-ulnar joints, wrist joints & hands	05	10

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Practical/ Clinical Placement
10	The Lower extremity: Hip joint & its ligament, muscles & movement Pelvic movements & joint analysis of movement of pelvis Knee joints- Structure/ ligaments/ movement/muscles Ankle & foot- Structure/ ligaments/ movements of ankle and foot	08	10
11	Locomotions: Sitting/Standing/Walking/ Running/ Swimming Posture and gait: a) Normal Posture b) Abnormal Posture c) Normal Gait d) Gait analysis	07	14
12	Manipulative skills: ❑ Classification ❑ Application of pushing/ pulling/ lifting/ throwing/ striking	05	07
13	Application of Kinesiology: ❑ Abdominal exercises, posture correction	06	07
14	Application of kinesiology to the technique of Physical &Occupational Therapy: ❑ Technique of Testing ❑ Range of joint motions ❑ Technique of treatment ❑ Bandaging and strapping massage ❑ Musclere-education & exercise therapy ❑ Occupational therapy techniques & Functional training	08	11
15	Handling technique	05	11
16	Positioning of patients	05	06
17	Muscle power measuring	05	06
	Total=	**100**	**150**

Teaching Methods :

- Lecture
- Oral, Practical and Demonstration

Media:

- Multi media
- Laptop
- OHP
- White Board
- Marker
- Laboratory
- Clinical ward
- Electrical adjustment bed
- Model
- Examination bed
- Equipments- Goniometer, Measuring tap

Assessment :

Written – SAQ= 80 marks, MCQ=20 marks
Practical or OSPE 40 marks, Oral/SOE-40 marks, Formative-20 marks

Paper V : Subject- Therapeutic Exercise

Total hours : 300 hours
Lecture : 100 hours
Practical : 200 hours

Total marks : 200
Written : 100
Oral : 40
Practical : 40
Formative : 20

Objectives:

At the end of the course the students will be able to:

- explain the passive, active, and resisted exercise of limbs, trunks and neck
- describe some idea of special exercise eg. Babat, Kabat, PNF etc in the treatment of abnormal neurological condition
- narrate the utility and uses of the equipment used in the process of Therapeutic Exercise

List of competencies

Therapeutic exercise is professional practice that involves designing and implementing movement experiences for the purpose of restoring or improving motor function to a level that enables people to reach personal or career goals unencumbered by physical limitations.
Therapeutic exercise program are to provide the following competencies:

- Provision of care.
- Interpersonal communications.
- Apply safe working practices
- Apply patient handling technique
- Apply Positioning of patients
- Analyze Muscle power measuring
- Analyze and assemble the components of skeleton system.
- Analyze the joints by using X-Ray films.
- Analyze the Orthotics and prosthetics
- Analyze the Locomotion and Gait.
- Maintain a treatment plan for Balance and co-ordination
- Differentiate various joint and muscles function
- Identify the major neural tissues.
- Follow a treatment plan for stiff parts of body.
- Plan and regimen to stimulate muscles.
- Assesses and create a message therapy.
- Carry out Physiotherapy assessment and develop exercise regimen.
- Apply remedy for back pain and abnormal gait.
- Prepare assessment chart and rehabilitation protocol.

- **Services**

1. Able to counsel patients/clients regarding healthy behaviours and lifestyle management.
2. Demonstrate understanding of therapeutic modalities and treatment applications used to optimize rehabilitation, including but not limited to ice, heat, exercise, taping, transcutaneous electrical nerve stimulation, and ultrasound.
3. Able to provide customized exercise prescription for healthy individuals, including but not limited to flexibility; strength, endurance, balance, and cardiopulmonary training; and corrective movement patterning.

4. Able to monitor, re-assess, and adjust prescriptions/treatment plans based on patient/client responses.
5. Able to make recommendations for task and/or job modification and accommodation based on assessment of the demands of the workplace, and evaluate effectiveness.
6. Able to collect and objectively evaluate data on the effectiveness of programs and services.

Course Contents of Therapeutic Exercise

Sl. No	Topics/Lessons	Teaching/learning hours	
		Lecture	Practical/ Clinical placement
1	Introduction to Exercise: Exercise therapy/Active & passive exercise/Resisted exercise Relaxation/ROM	08	20
2	Introduction to Neuromuscular Facilitation: Proprioceptive Neuromuscular Facilitation Functional re-eduction: Lying to sitting/ Sitting activity & Gait/ Limb activity	10	20
3	Joint mobility: Technique of mobilising joint	10	20
4	Muscle strength: Technique of strengthening muscle	10	20
5	Neuromuscular co-ordination: Posture/ Walking aids	08	10
6	Individual, group & mass treatment by exercise: Scheme of exercise	10	20
7	Special technique of exercise: Babath/Kobath/P.N.F etc/Rood technique/Frankel's exercise	08	13
8	Indications and contraindications of therapeutic exercises	08	05
9	Chest Physiotherapy: Postural drainage and breathing exercise	04	15
10	Orthotics and prosthetics	05	10
11	Balance and co-ordination, Vertigo exercise	05	15
12	Therapeutic massage, Manipulation and Glaiding technique	04	10
13	ADL General, Transfer technique, Patient positioning	05	12
14	Basic Nursing Care	05	10
	Total=	**100**	**200**

Teaching Methods :

- Lecture
- Oral, Practical and Demonstration

Media:

- Multi media
- Laptop
- OHP
- White Board
- Marker
- Laboratory
- Clinical ward
- Electrical adjustment bed
- Model
- Examination bed
- Equipments- Shoulder wheel, Quadriceps table, CPM machine, Pully, Suspension therapy unit

Assessment :

Written – SAQ= 80 marks, MCQ=20 marks
Practical or OSPE 40 marks, Oral/SOE-40 marks, Formative-20 marks

3rd Year
Paper I : Subject- Electrotherapy and Hydrotherapy

Total hours: 250 hours **Total marks : 200**
Lecture : 100 hours **Written : 100**
Practical: 150 hours **Oral & Practical : 40+40**
Formative : 20

Objectives:
At the end of the course the students will be able to:

- describe basic knowledge of electro medical physics
- narrate the different kinds of current used in the department of physiotherapy
- explain about electrical stimulation electrical ray etc
- enumerate about the method of ice therapy and its uses
- describe basic explained the knowledge about hydrotherapy
- explain about the idea of full immersion and partial immersion baths
- describe electrical shock and its precautionary measures
- demonstrate about the method of paraffin wax baths and its uses

List of competencies
Electrotherapy is used for relaxation of muscle spasms, prevention and retardation of disuse atrophy, increase of local blood circulation, muscle rehabilitation, and re-education by electrical muscle stimulation, maintaining and increasing range of motion, management of chronic and intractable pain, posttraumatic acute pain, postsurgical acute pain, immediate postsurgical stimulation of muscles to prevent venous thrombosis, wound healing and drug delivery.
The list of competencies are the followings-

- Maintain safe working use electrical modality and hydrotherapy pool.
- Differentiate various muscles.
- Design a treatment plan for stiff parts of body.
- Illustrate the effects of IRR.
- Execute remedial effects of cryotherapy.
- Abstract benefits of SWD.
- Lay out therapeutic use of UST.
- Plan and regimen to stimulate muscles.
- Assesses and create a message therapy.
- Knowledge about of Physics of exercise in water
- Prepare assessment chart and rehabilitation protocol.
- Plan and regimen to Hydrotherapy
- Interacting with Patients of Different Ages, Races, and Socio-Economic Backgrounds
- Orienting, Supervising, and Training Students, Volunteers, and Support Staff
- Recommending Modifications of Treatment to Physical Therapist
- Reporting
- Teamwork
- Verbal Communications
- Writing Patient Progress Notes

Services

- Able to counsel patients/clients regarding healthy behaviours and lifestyle management.
- Able to monitor, re-assess, and adjust prescriptions/treatment plans based on patient/client responses.
- Able to make recommendations for task and/or job modification and accommodation based on assessment of the demands of the workplace, and evaluate effectiveness.
- Able to collect and objectively evaluate data on the effectiveness of programs and services.

Course Contents of Electrotherapy and Hydrotherapy

Sl. No	Topics/Lessons	Teaching/learning hours	
		Lecture	Practical/ Clinical placement
	A) Electrotherapy		
1	Physics and Basic of electric equipment	15	25
2	Electrical stimulation of nerve and muscle: Faradic type current Interrupted direct current etc	15	20
3	Methods of heating the tissues: Physiological effect of heat SWD/ IRR/ MWD/ Electing heating pads/ Paraffin wax	35	30
4	Ultra sound therapy	15	10
5	Ultra violet radiation	11	06
6	Cold therapy	10	06
7	LASER, IFT	16	08
8	Physics of exercise in water	08	05
9	Traction: Manual/ electrical/ Continuous/ Intermittent/ Cervical / Lumbar	10	10
10	TENS: Transcuteneous Electrical Nerve Stimulation	05	10
	B) Hydrotherapy:		
11	History of Hydrotherapy: Physical properties of water: Hydrotherapy Pool, Tank Purification of pool water Indication and Contraindication Physiological and theraputic effect Danger and prequation Accessories Temperature of pool	20	20
	Total =	**100**	**150**

Teaching Methods : Lecture,

- Oral, Practical and Demonstration

Media:

- Multi media
- Laptop
- OHP
- White Board
- Marker
- Laboratory
- Clinical ward
- Electrical adjustment bed
- Model
- Examination bed
- Equipments (SWD, UST, MWD, IRR, IFT, EST, LASER, UVR, TENS, WAX BATH TRACTION, HEATING PAD, HYDRO THERAPY UNIT, COLD THERAPY UNIT)
- Transport and fuel

Assessment :

Written – SAQ= 80 marks, MCQ=20 marks

Practical or OSPE 40 marks, Oral/SOE-40 marks, Formative-20 marks

Paper II : Subject- Physiotherapy in Medical Conditions

Total hours: 250 hours
Lecture : 100 hours
Practical: 150 hours

Total marks : 200
Written: 100
Oral & Practical : 80
Formative: 20

Objectives:

At the end of the course the students will be able to:

- describe basic knowledge of physiotherapy
- mention the brief aetiology of the different medical condition
- describe the clinical features of the different medical condition
- explain the pathology of the different medical condition
- describe the medical treatment of the different medical condition
- explain alternate methods of physiotherapy management treating the different medical condition

List of competencies

Physiotherapists help people recover Medical conditions with injuries sustained illness, ageing or disability. They guide patients to improve their strength and movement and prevent further problems in future.

The list of competencies are the followings-

- Implement to treatment plan of medical disease and problems.
- Working with patients with a variety of conditions, sometimes over a period of weeks or months
- Encouraging exercise and movement
- Advising patients on leading a healthy lifestyle
- Keeping reports on patients and their progress
- Liaising with other healthcare professionals to encourage a holistic approach to treatment
- Staying up to date with developments in treatments
- Being caring, compassionate, and patient.
- Identify the major neural tissues.
- Relate the anatomical position of circulatory system on mannequin.
- Illustrate cardiac and respiratory system.
- Arrange organs on dummy for excretory system and reproductive system.
- Design a treatment plan for stiff parts of body.
- Plan and regimen to stimulate muscles.
- Assesses and create a message therapy.
- Carry out Physiotherapy assessment and develop exercise regimen.
- Design remedy for back pain and abnormal gait.
- Prepare assessment chart and rehabilitation protocol.

Services

Abel to ---

- Counsel patients/clients regarding healthy behaviours and lifestyle management.
- Monitor, re-assess, and adjust prescriptions/treatment plans based on patient/client responses.
- Make recommendations for task and/or job modification and accommodation based on assessment of the demands of the workplace, and evaluate effectiveness.
- Collect and objectively evaluate data on the effectiveness of programs and services.

Course contents of Physiotherapy Treatment in Medical Conditions

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Theory	**Practical/ Clinical placement**
1	**Introduction to fractures:** a) Definition b) Classification c) Causes d) Clinical features e) Healing of factures f) Complications g) Principles of management h) Physiotherapy management i) Facture of Upper limbs, Lower limbs, Spine j) Plaster	05	10
2	**Dislocations:** a) Traumatic dislocations b) Shoulder joint c) Acromioclavicular joint dislocation or subluxation d) Elbow joint e) Metacarpophalangeal and interphalageal joints f) Hip joint g) Patella	10	10
3	**Common orthopaedic diseases of bones & joints:** Aetiology, pathology, sign/ symptoms, & physiotherpeutic management	08	10
4	**Degenerative arthropathies:** a) Oesteoarthitis b) Cervical and Lumber spondylosis c) Spondylolysis d) Spondylolisthesis	10	20
5	**Inflammatory arthropathies:** a) Ankylosing spondylitis b) Rheumatoid arthritis c) Juvenile chronic arthritis d) Reiter's disease	10	10
6	**Soft tissue injuries:** a) Frozen shoulder, Tendonitis b) Bursitis c) Capsulitis, Synovitis d) Anklesprain e) Whiplash of the cervical spine f) Crush injury	10	10
7	**Metobolic diseases:** a) Diabetic Mellitus b) Gout c) Rickets and Osteoprosis, Osteomalasia	06	08
8	**Skin disease:** a) Acne b) Vitiligo c) Psoriasis d) Alopasia	06	10
9	**Congential abnormalities:** a) Telephas eqinovarus and valgus b) Kyphosis, Scoliosis, Lordosis	05	20
10	**Infectious diseases:** a) Tuberculosis b) Polio Myelitis c) Leprosy	05	12

11	Amputation, Arthoplastic, Arthodesis patellectomy, laminectomy, synovectomy	10	12
12	Burn and Plastic surgery	05	08
13	Common problem of ENT (Mastoidectomy)	05	05
14	Common Gaynae problem a) Musculoskeletal disorders during and after pregnancy b) Child birth complications after delivery	05	05
	Total =	**100**	**150**

Teaching Methods :

- Lecture
- Oral, Practical and Demonstration

Media:

- Multi media
- Laptop
- OHP
- White Board
- Marker
- Laboratory
- Clinical ward
- Electrical adjustment bed
- Model
- Examination bed
- Equipments
- Clinical placement
- Transport and fuel

Assessment :

Written – SAQ= 80 marks, MCQ=20 marks
Practical or OSPE 40 marks, Oral/SOE-40 marks, Formative-20 marks

Paper III: Subject- Physiotherapy in Surgical Conditions

Total hours: 250 hours **Total marks: 200**
Lecture: 100 hours **Written : 100**
Practical: 150 hours **Oral & Practical : 40+40**
Formative: 20

Objectives:
At the end of the course the students will be able to:

- describe basic knowledge of physiotherapy in surgical condition
- identify the different surgical conditions requiring physiotherapy
- describe the clinical features of the different surgical condition
- plan rehabilitation programme for individual disability

List of competencies
As a physiotherapist:

- Work with patients who have a range of conditions, including neurological, neuromusculoskeletal, cardiovascular and respiratory, sometimes
- Make a clinical assessment and diagnosis in order to treat their physical problem/condition
- Design and review clinical management plans that encourage exercise and movement by the use of a range of techniques, and which may include specialist rehabilitation, life-style medicine, long-term strategies, and clinical techniques
- Involve parents and carers in the treatment, review and rehabilitation of patients
- Educate patients and their carers about how to prevent and/or improve conditions
- Keep up to date with new techniques and technologies available for treating patients
- Supervise student and junior physiotherapists and physiotherapy support workers
- Be legally responsible and accountable
- Be caring, compassionate and professional at all times
- Manage clinical risk
- Making assessments of patients' physical conditions.
- Formulating treatment plans to address the conditions and needs of patients.
- Conducting complex mobilization techniques.
- Assisting trauma patients with how to walk again.
- Educating patients, family members, and the community on how to prevent injuries and live a healthy lifestyle.
- Referring patients to doctors and other medical practitioners.
- Planning and organizing physiotherapy and fitness programs.
- Plan and regimen to stimulate muscles.
- Assesses and create a message therapy.
- Carry out Physiotherapy assessment and develop exercise regimen.
- Design remedy for back pain and abnormal gait.
- Prepare assessment chart and rehabilitation protocol.

Services
Able to--

- Counsel patients/clients regarding healthy behaviours and lifestyle management.
- Monitor, re-assess, and adjust prescriptions/treatment plans based on patient/client responses.
- Make recommendations for task and/or job modification and accommodation based on assessment of the demands of the workplace, and evaluate effectiveness.
- Collect and objectively evaluate data on the effectiveness of programs and services.

Course content of Physiotherapy Treatment in Special Surgical Conditions

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Practical/ Clinical placement
1	**Peripheral nerve lesion:** Upper limb a) Median nerve b) Ulnar nerve c) Radial nerve d) Brachial plexus Lower limb a) Sciatic nerve b) Common peroneal nerve c) Tibial nerve	15	20
2	Bedsore and its management	05	05
3	**Different disease of Spine:** a) Spine bifida b) Spinal stenosis c) PLID/PID d) Spinal injury (Bony and soft tissue) e) Spinal TB f) Spondylolisthesis	15	20
4	**Neuro surgery :** a) ICSOL (Brain tumour) b) Spinal SOL (Spinal tumour) c) Craniotomy d) Laminectomy e) Discectomy f) Decompression g) Spinal fixation h) Head injury	15	25
5	Malignancy: Brain, Spine, Chest, Bones and joints	10	15
6	Planning of Rehabilitation programme for individual disability	15	20
7	Basic Anatomy and phology of cardiopulmonary system	05	10
8	**Pulmonary surgery:** Definitions Indications for surgery Types of operation Complications of pulmonary surgery a) Pneumonectomy b) Lobectomy Thoraco plasty	10	20
9	**Diseases of heart:** a) Congenital abnormality of heart b) Open heart surgery CABG, Valve replacement, VSD c) Close heart surgery	10	15
	Total=	**100**	**150**

Teaching Methods : Lecture, Oral, Practical and Demonstration

Media: Multi media, Laptop, OHP, White Board, Marker, Laboratory, Clinical ward, Electrical adjustment bed, Model, Examination bed, Equipments

Assessment :

Written – SAQ= 80 marks, MCQ=20 marks
Practical or OSPE 40 marks, Oral/SOE-40 marks, Formative-20 marks

4th Year
Paper I : Subject- Physiotherapy in Special Medical Conditions

Total hours : 400 hours | **Total marks : 200**
Lecture : 100 hours | **Written : 100**
Practical : 150 hours | **Oral & Practical : 80**
Special Lab Attachment: 150 | **Formative : 20**

Objectives:

At the end of the course the students will be able to :

- describe basic knowledge of physiotherapy in special medical conditions
- identify the different special medical conditions requiring physiotherapy
- describe the clinical features of the different special medical conditions
- plan rehabilitation programme for individual disability

List of competencies

Physiotherapists work with a variety of patients I Specially Medical condition including physically disabled children, women before and after giving birth, athletes, patients who are in hospital or attending clinics and people within the community.

- Helping patients recover from accident, illness or injury
- Organizing therapeutic physical exercise sessions
- Providing massages
- Providing education and advice about exercise and movement
- Keeping up to date with the latest advancements in the profession
- Apply safe working practices
- Operate using suitable tools and equipments with basic outline of physiotherapy and develop a vocabulary of appropriate terminology.
- Identify the major neural tissues.
- Relate the anatomical position of circulatory system on mannequin.
- Categorize foods according to nutrients and assemble organs of digestive system.
- Illustrate respiratory system.
- Arrange organs on dummy for excretory system and reproductive system.
- Design a treatment plan for stiff parts of body.
- Plan and regimen to stimulate muscles.
- Carry out Physiotherapy assessment and develop exercise regimen.
- Design remedy for back pain and abnormal gait.
- Collecting statistics
- Prepare assessment chart and rehabilitation protocol.

Services

Able to--

- Counsel patients/clients regarding healthy behaviors and lifestyle management.
- Monitor, re-assess, and adjust prescriptions/treatment plans based on patient/client responses.
- Make recommendations for task and/or job modification and accommodation based on assessment of the demands of the workplace, and evaluate effectiveness.
- Collect and objectively evaluate data on the effectiveness of programs and services.

Course contents of Physiotherapy Treatment in Special Medical Conditions

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Practical/ Clinical placement
1	**Basic neurology:** a) Motor b) Sensory c) Neurological examination	05	10
2	**Disease of Central Nervous system :** a) Stroke (Hemiplegia, Monoplegia, Tretraplegia) b) Meningitis c) Encephalitis d) Parkinsonism e) Paraplegia f) Quadriplegia g) CP h) Motor neuron disease	15	25
3	**Neuropathies :** a) Bells Palsy/Facial Palsy b) GBS c) Poly neurolopathy	08	10
4	Musculur Distropy and Atropy	05	10
5	**Diseases of the brain & spinal cord:** a) Transvers mylitis b) Multiple sclerasis	10	10
6	Myopathy	05	05
7	Neurological conditions affecting children	05	10
8	Review of basic cardio-respiratory Anatomy and Physiology	05	10
9	**Disease of the Cardioviscular system:** a) Carditis b) Rheumatic fever c) Ischamic heart disease d) Congenital heart disease e) ICU/CCU Management	07	10
10	Diseases of respiratory system: a) Pneumonia b) Pleuraleffusion/Pneumothorax/Hydrothorax c) Pulmonary tuberculosis	10	10
11	Chronic Obstructive Airway Diseases: a) Bronchitis b) Bronchictasis c) Emphysema d) Bronchial asthma e) Cystic fibrosis f) Lung abscess g) Pleurisy	15	15
12	Cardio pulmonary rehabilitation	05	10
13	Geriatric disease	05	05
14	Sports medicine: a) Injury related to- cricket, basket ball, foot ball, tennis, badminton, golf b) Sports injury related to upper and lower limb also spine	10	10
	Total=	**110**	**150**

Teaching Methods :

- Lecture
- Oral, Practical and Demonstration

Media:

- Multi media
- Laptop
- OHP
- White Board
- Marker
- Laboratory
- Clinical ward
- Electrical adjustment bed
- Model
- Examination bed
- Equipments
- Clinical placement- in specialised institutes/hospital
- Transport and fuel

Assessment :

Written – SAQ= 80 marks, MCQ=20 marks
Practical or OSPE 40 marks, Oral/SOE-40 marks, Formative-20 marks

Paper II : Subject- Clinical Practice & Professional Ethics

Total hours : 400 hours
Lecture : 100 hours
Practical : 150 hours
Special Lab Attachment: 150

Total marks : 200
Written : 100
Oral & Practical : 80
Formative : 20

Objectives:

At the end of the course the students should be able to:

- write brief assessment of the patient
- record of the treatment given to the patient
- handle the equipments and to keep the equipments tidy, neat and clean
- narrate learning and acquiring professional skill by clinical practice
- explain interpersonal and inter professional relationship as regards to patients', officers and staff of the department
- describe knowledge of the departmental administration for maintaining the discipline

List of competencies

Ethical competence is a key distinguisher between simply having skills and having a true sense of professionalism. It is the stage beyond technical competence where ethical competence must be considered when extending policies to support skill and competencies to training and education for professional occupations.

The list of competencies are the followings-

- Apply safe working practices
- Comply with environment regulation and housekeeping
- Interpret & use company and medical communication.
- Understand and apply the concept in productivity, quality tools and labour welfare legislation in day-to-day work to improve productivity & quality.
- Explain energy conservation, global warming and pollution and contribute in day-to- day work by optimally using available resources.
- Explain personnel finance, entrepreneurship and manage/organize related task in day-today work for personal & societal growth.
- Utilize basic computer applications and internet to take benefit of IT developments in the Industry.
- Operate using suitable tools and equipments with basic outline of physiotherapy and develop a vocabulary of appropriate terminology.
- Analyze and assemble the components of skeleton system.
- Analyze the joints by using X-Ray films.
- Differentiate various muscles.
- Recognize basic cell structure and its organelles.
- Identify the major neural tissues.
- Relate the anatomical position of circulatory system on mannequin.
- Categorize foods according to nutrients and assemble organs of digestive system.
- Illustrate respiratory system.
- Arrange organs on dummy for excretory system and reproductive system.
- Design a treatment plan for stiff parts of body.

- Illustrate the effects of IRR.
- Execute remedial effects of cryotherapy.
- Abstract benefits of electrotherapy modalities.
- Plan and regimen to stimulate muscles.
- Assesses and create a message therapy.
- Carry out Physiotherapy assessment and develop exercise regimen.
- Design remedy for back pain and abnormal gait.
- Prepare assessment chart and rehabilitation protocol.

Services

- Able to counsel patients/clients regarding healthy behaviours and lifestyle management.
- Able to monitor, re-assess, and adjust prescriptions/treatment plans based on patient/client responses.
- Able to make recommendations for task and/or job modification and accommodation based on assessment of the demands of the workplace, and evaluate effectiveness.
- Able to collect and objectively evaluate data on the effectiveness of programs and services.

Course Contents of Clinical Practice & Professional Ethics

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Theory	Practical/ Clinical placement
A	***Clinical Practice***		
1	Patient assessment and its technique	05	10
2	**Proper and safe uses of therapeutic instruments :** IRR, Wax Bath, UST, SWD, MWD, EST, IFT, UVR, LASER	10	15
3	Physiological and therapeutic effects of Therapeutic instruments	05	10
4	Methods of application of different therapeutic instrument & basic explained knowledge about instruments	05	10
5	Techniques of application of different therapeutic instrument	05	10
6	Indications and contra-indications of use of different therapeutic instrument	05	10
7	To study different technique of treatment to various medical & surgical conditions in relation to their physical disability	05	10
8	Planning of Rehabilitation programme for various medical & surgical conditions in relation to individual disability	06	10

B	**Professional Ethics**		
1	1) History of Physiotherapy and scope of Physiotherapy practitioner:	04	05
	2) Definition of Ethics and its principle for physiotherapy, Geneva declaration	04	05
	3) Physiotherapy right and privilege, Patients right and privilege	04	05
	4) Legal aspects- Medico-legal action and consumer protection	04	05
	5) Malpractice- Civil and Criminal	04	05
	6) Professional secrecy Infamous conduct/professional misconduct	05	05
	7) Inform Consent, Dichotomy and fees sharing	04	04
	8) Health care and delivery system of Bangladesh	02	04
	9) Prejudice, Record keeping	02	04
	10) Characteristics of a good physiotherapist	02	04
	11) Aims and objective of physiotherapist	02	04
	12) Confidentiality/responsibility/privacy of the patient	04	02
	13) Attitude and approach towards patients, patients' relations & attendants	04	04
	14) Attitude and approach towards physician and other multidiscipline	03	03
	15) Duties of medical practitioner and physiotherapist	02	04
	16) Job description of physiotherapist	04	02
	Total=	**100**	**150**

Teaching Methods :

- Lecture
- Oral, Practical and Demonstration

Media:

- Multi media
- Laptop
- OHP
- White Board
- Marker
- Laboratory
- Clinical ward
- Electrical adjustment bed
- Model
- Examination bed
- Equipments - IRR, Wax Bath, UST, SWD, MWD, EST, IFT, UVR, LASER
- Transport and fuel

Assessment :

Written – SAQ= 80 marks, MCQ=20 marks
Practical or OSPE 40 marks, Oral/SOE-40 marks, Formative-20 marks

Outline of Institutional Academic Laboratory

There are two important elementary features of a physiotherapy department which are as follows:

1. Architectural
2. Personals

1. **Architectural**: The architectural design should be suitable for Student number, patients and stuff of the department.

Characteristics-

- The department should be in more or less lonely place.
- It should be in the ground floor.
- Wide access to the ground floor.
- It should have specious corridor.
- It should be well ventilated.
- It should be well lighted especially natural light.
- The floor should made of non-slippery materials.
- Emulating plastic sheets should be on the floor of electrotherapy department.
- Fittings such as well-bars, horizontal bars, sling suspension, parallel bar, stairs for climbing exercise should available and in good condition.
- Sufficient treatment room is required with waiting room, tearoom for stuff, changing room for staff and patient, Gymnasium and Hydrotherapy room.

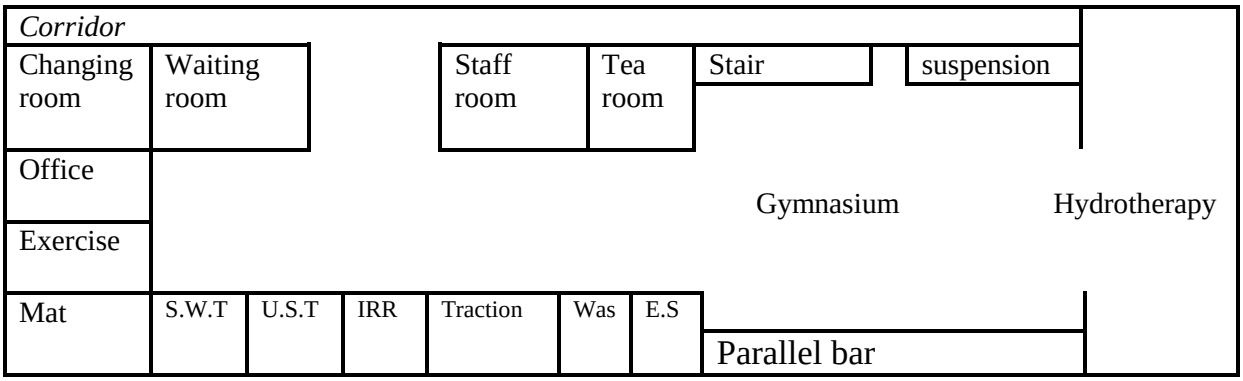

Figure- Diagram of Physiotherapy Outdoor

2. **Personals:** Sufficient personal are required in the department according to the number of the patients the personals may be-

a. Senior Physiotherapist/Assistant Professor (Physiotherapy)
b. Physiotherapist/Lecturer (Physiotherapy)
c. Instructor (Physiotherapy)
d. Medical Technologist (Physiotherapy)
e. Hydrotherapist
f. Helper
g. Accountant
h. Peon
i. Cleaner
j. Electrician

Physiotherapy Equipment's:

Equipment	Quantity (unit)
Office Equipment ▪ Desk ▪ Chairs ▪ Waiting room furniture ▪ Door mats ▪ Various cleaning supplies ▪ Trash cans / Bags ▪ Computer, software, hardware ▪ EMR, Billing, & Accounting software ▪ Cash box ▪ Filing cabinet ▪ Patient chart materials ▪ Multi-function copier/fax/scanner ▪ Washer / Dryer / Laundry basket ▪ Refrigerator / Microwave ▪ Coffee maker ▪ Various kitchen / break room supplies ▪ Business stationery ▪ Referral pads ▪ Business cards ▪ Brochures, etc. ▪ Consult your office manager for ideas.	
Devices for Tests and Measures ▪ Goniometers ▪ Tape measures ▪ Grip dynamometer ▪ Manual muscle testing dynamometer ▪ Reflex hammer ▪ Neurological testing instruments ▪ Blood pressure cuff ▪ Stethoscope ▪ Thermometer ▪ Video analysis hardware & software ▪ FCE testing equipment or system	
First-Aid & Medical Supplies ▪ First Aid Supplies ▪ Band aids: assorted sizes ▪ Rubbing alcohol ▪ Tongue depressors ▪ Cotton swabs ▪ Gauze ▪ Athletic tape ▪ Ace wrap	
Basic Physiotherapy Equipment ▪ Treatment tables: wooden plinths ▪ Treatment tables: high-low adjustable ▪ Mat table ▪ Treatment room cabinets, chairs ▪ Large mirror for visual feedback	

▪ Adjustable height exercise steps ▪ Linens: gowns, towels, sheets, pillows, pillowcases, blanket, etc. ▪ Step stools ▪ Therapist stools on wheels ▪ Variety of bolsters, wedges, supports ▪ Mobilization belts and devices ▪ Gait belt ▪ Various assistive devices ▪ Taping supplies ▪ Orthotics / Splinting materials	
In-House Educational Materials ▪ Skeleton ▪ Anatomical posters ▪ Anatomical models ▪ Tablet / Computer for patient education ▪ Health education posters	
Basic Modalities ▪ Hydrocollator with hot packs ▪ Small freezer for cold modalities ▪ Ice packs ▪ Ice massage cups ▪ Vaso pneumatic compression device ▪ Massage cream ▪ Multiple mode electrical stimulator ▪ Electrodes ▪ Traction unit, table and accessories ▪ Iontophoresis unit ▪ Paraffin bath	
Fitness / Exercise Equipment ▪ Adjustable height pulleys ▪ Dumbbells: complete set of paired weights in 1# increments, 1-10# ▪ Dumbbells: 10#, 15#, 20# ▪ Cuff weights: set of paired weights in 1# increments, 1-10# ▪ Resistive tubing / Bands ▪ Putty ▪ Reciprocal pulley ▪ Medicine balls ▪ Supine shuttle-style leg press machine ▪ Multi-purpose, multi-joint, adjustable resistive machine ▪ Treadmill ▪ Upper Body Ergometer ▪ Upright / Recumbent Bike ▪ Parallel bars or wall bars ▪ Balance boards—assorted types ▪ Various sports performance equipment: medicine balls, ▪ rebounder, agility ladder, plyometric station, sport specific ▪ equipment ▪ Foam rolls ▪ Gym ball	

▪ Lateral slide device	
EMG biofeedback or diagnostic equipment ▪ EMG biofeedback unit	
Bio-Physical Therapy ▪ Bio-Physical therapy unit	
Electrotherapy Equipment ▪ Short Wave Diathermy (SWD) ▪ Micro Wave Diathermy (MWD) ▪ Shock Wave Diathermy ▪ Continuous Passive Movement (CPM) ▪ Laser Unit ▪ Interferential Therapy (IFT) ▪ Infrared Ray (IRR)- Luminous ▪ Infrared Ray (IRR)- Non Luminous ▪ Ultrasound Therapy ▪ Digital Auto Traction unit ▪ Transcutaneous Electrical Nerve Stimulation (TENS) ▪ Muscle Stimulator ▪ Static Cycle ▪ Air pressure Therapy unit ▪ Vibrator	

Benefit of Institutional based Physiotherapy Outdoor

- Improving Skill of educational knowledge.
- Research
- Face to face Patient handling
- The physiotherapy student are learns about of Clinical history
- The physiotherapy student assesses and diagnoses Clinical condition
- They receive a treatment plan that sets goals for Physiotherapy Treatment
- Prescribed a course of exercises and any assistive devices needed
- Improving Self confidence

Common conditions managed by Physiotherapists

Painful conditions such as arthritis, neck and back pain, incontinence, trauma (accidents), stroke, Parkinson disease and spinal cord injuries, Heart problems and Lung problems

Role of physiotherapy in health care

- Managing chronic and acute conditions,
- Preventing disease, injury and disability
- Maintaining optimal functional independence,
- Rehabilitation after disease, injury and disability,
- Work with children with coordination, balance and other movement problems to improve and maximize their independence
- Education and promoting healthy lifestyles and exercise.

Treatment modalities do Physiotherapists use

- Exercises

- Electrotherapy
- Hydrotherapy
- Manual therapy
- Biofeedback
- Education and advice.

Special areas in physiotherapy

- Orthopaedics
- Neurology
- Cardiopulmonary
- Obstetrics and gynaecology
- Paediatrics
- Sports Physiotherapy
- Geriatric Physiotherapy
- Palliative care Physiotherapy
- EMG biofeedback or diagnostic
- Bio-Physical therapy

Categories of Physiotherapy services

Services offered by the physiotherapy department can be categorized into clinical, training, gymnasium and general advice on health and well being.

Clinical services offered include

- Adult in-patients (wards)
- Adult out-patients (Therapeutic exercises and electrotherapy).
- Paediatrics in-patients (wards)
- Pediatric out-patients
- Special school
- Specialist clinics (Pediatric neurology and orthotics and prosthetics clinics).

Job description of Medical Technologists (Physiotherapy)

A***. General Job***

Medical Technologists (Physiotherapy) should work under physiotherapy department assigned by the controlling authority.

Maintenance of stock knowledge of equipment, chemicals and accessories such as :

a) S.W.D. b) M.W.D c) I.R.R d) Ultrasound e) Gelly

3. Commitment to the patient
    a) Should be well behaved to the patients and attendants.
    b) Explain procedures and consequences to the patients and their attendants.
    c) Motivation and counselling where and needed.
    d) Consent of the patient where needed.
    e) Maintain confidentiality strictly and follow professional ethics.
    f) Handle the critically ill patient with due care and sympathy.
    g) Have enough explained knowledge to handle critically ill patient like quadriplegia, paraplegia and cerebral palsy.

4. Reception and advice to patient
    a) Patients requisition form should be checked including history of present and past illness in details.
    b) Advise patient to go to the specific room.
    c) Prepare the patient: make sure patient wears cotton clothes and removing synthetic and metallic wearing before use of instruments.

5. Maintain records:
    Departmental records
    Patients' record with name, age, sex, occupation and H/O previous operation
    Breakage and missing records

6. Prepare indent books and proper maintenance of indent record with the expenditure records of chemicals, jelly etc.

7. Make sure of proper collection and disposal of contaminated needles, syringes and other materials.

8. Help and face general audit.

9. Assure proper safety measures for use of electrical instruments for physiotherapists, patients and also attendants.

10. Supervision and training of junior colleagues.

11. Send periodic reports to the higher authorities.

B. **Specific Job:**

1. Operate S.W.D, M.W.D, I.R.R, IFT, TENS, EST, LASER and UST etc, and acquire explained knowledge and skills about modern development about these instruments and Maintenance of the above instruments
2. Proper knowledge about first aid like cardiac massage.
3. Proper maintenance of physiotherapy department.

C***. At the Teaching Institutes:***

At the teaching Institutes the Medical Technologists (Physiotherapy) personnel are positioned at three levels:

a. Lecturers
b. Instructors
c. Technologists

a. *Lecturers*:
   - They shall perform small group teaching in tutorial, demonstration, and practical classes.
   - Facilitate practical demonstration and work of the students in the Physiotherapy demonstration room as a 'facilitator' of practical 'teaching group'.
   - Senior lecturers can perform large group teaching as well.

b. *Instructors*:
   - They will perform tutorial and demonstration classes relevant to practical items.
   - Ensure and guide the students to prepare practical note books.
   - Demonstrate elaborately procedures and methods of the practical works in the demonstration room and follow students' performance in the practical classes.
   - Supervise practical classes as a 'Team leader'.

c. *Technologists*:
   - They shall perform practical in all practical classes.
   - Run practical demonstration and works for the students.
   - Perform small group demonstration relevant to practical.
   - Maintain instruments, apparatus, glass wares and other laboratory material and logistics.
   - Responsible for demonstration room set up and organisation including maintenance of
   - registers, records and stock knowledge under guidance of the supervisors.
   - Responsible for the security and safety of the demonstration room especially in respect to fire, electric hazards and disposal of wastes.

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