

# **Curriculum for Diploma in Medical Technology of Operation Theatre Assistant (OTA)**

**The State Medical Faculty of Bangladesh**

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**September 2022**

**Curriculum for Diploma in Medical Technology of Operation Theatre Assistant  
(OTA)**

**Directorate General of Medical Education (DGME)**  
Mohakhali, Dhaka

*Supported by-*  
**Institute of Health Technology Mohakhali, Dhaka**

## Preface

Curriculum is a formal plan of educational experiences and activities offered to a learner under the guidance of an educational institution. Curriculum in fact is an organised plan of course outlines, along with the objectives and learning experiences to be used for achievement of these activities. 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 focused towards the need of the stakeholders and country. The present HT curriculum with its assessment method 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.

More emphasis has been given on ethics, communication skills, behavioural science, basic computer science, communicative English, primary health care, climate change, environment and sanitation. Total duration of the curriculum has been increased from 3 years to 4years. in this curriculum list of competencies have been identified to acquire those by the provision of logbook based hands on training in this curriculum. 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 (Research, Publication, Curriculum Development), ADG (ME) & Directors of DGME, Secretary, SMFB, members of the working group and the involved faculty members of CME. My special thanks to all others who were involved in the development of this curriculum.

**Prof AKM Amirul Morshed**

Director General

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## Foreword

Curriculum development is not a static process rather it is a dynamic process. But it was also said that “It is easier to change a graveyard than to change a curriculum”. This curriculum was developed a few years back in 2009, 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 (IHTs) 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 to give it a final shape.

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 ME&FWD, 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 AKM Amirul Morshed Khasru, Director General (In charge), DGME for his guidance & supervision with their team involving ADG (ME) and all the Directors of DGME. I like to thank all the members of working committee of IHT Curriculum Development Committee for their continuous technical assistance and co-ordination to prepare this curriculum. The technical team comprising the faculty members of the Centre for Medical Education (CME), SMFB, DGME 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 & DGME who shared their expertise and worked hard to produce this valuable document.

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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 peoples, 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 AKM Amirul Morshed Khasru, Director General (In charge), DGME for his overall supervision in this activity along with ADG (Admin), ADG(ME) & 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.

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), DGME & SMFB who devoted their immense efforts, time and hard work to develop this curriculum. My special thanks to Professor Dr. Md. Humayun Kabir Talukder, Director (Research, Publication & Curriculum Development), DGME 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 DGME, SMFB & CME, who were involved directly or indirectly in preparation of this curriculum.

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## List of Content

Course Overview		7
<b>1st Year</b>		
I	English	15
II	Basic Anatomy	19
III	Basic Physiology	21
IV	Basic Community Medicine & Behavioural Science	23
V	Basic computer science	27
<b>2nd Year</b>		
I	Physics	32
II	Chemistry	35
III	Basic Microbiology & Parasitology	37
IV	Emergency Care	40
V	Patient Assessment	42
<b>3rd Year</b>		
I	Preparation For Surgery	44
II	Adjuncts To Surgery	46
III	Basic Of Operation	48
<b>4<sup>th</sup> Year</b>		
I	Post-Operative Care	51
II	Special Surgery	54
Outline of Institutional Academic Laboratory		56
Outline of Special Laboratory Attachment		58
Job description		58

## Course Overview

### Course Aims.

To prepare operation theatre technologists with knowledge, skill and attitude to bring about behavioral changes for enabling them to perform assigned responsibilities in their individual working stations.

### Course objectives:

After successful completion of the 4 years Diploma course in operation theatre technology the students will be able to:

- acquire a sound knowledge base in operation theatre Technology discipline.
- provide operation theatre services in different OTs: public & private health sectors.
- participate in organization and maintenance of OT.
- use, operate and maintain equipment, apparatuses and drugs of operation theatre.
- examine specimens, maintain records & submit periodical reports of an operation theatre.
- maintain OT safety, sterility and undertake measures for prevention of cross infection.
- know in details about disposal of different kind of OT wastes (biological, chemical etc).
- prepare trolley for different operations and supervise different operative activities in operation theatre.
- acquire adequate knowledge about OT ventilation and air conditioning system and different zones of operation theatre.
- manage any emergency surgical situations in a team
- carry out the role and responsibility of an operation theatre technologist in different types of OTs - Surgical, Gynae and Obstetrics, Orthopaedics, Eye, ENT etc.
- know common health problems and health care delivery services in Bangladesh.
- demonstrate values and attitude consistent with ethical and professional conduct.
- contribute to the future development of operation theatre technologist.

### List of Competencies :

Ability to-

- provide operation theatre services in different OTs: public & private health sectors.
- participate in organization and maintenance of OT.
- use, operate and maintain equipment, apparatuses and drugs of operation theatre.
- examine specimens, maintain records & submit periodical reports of an operation theatre.
- maintain OT safety, sterility and undertake measures for prevention of cross infection.
- manage any emergency situations in OT
- carry out the role and responsibility of an operation theatre technologist in different types of OTs – Surgical, Gynae and Obstetrics, Orthopaedics, Eye, ENT etc.
- know in details about disposal of different kind of OT wastes (biological, chemical etc).
- Prepare trolley for different operations and supervise different operative activities in operation theatre.
- Acquire adequate knowledge about OT ventilation and air conditioning system and different zones of operation theatre.
- deal with common health problems and health care delivery services in Bangladesh.
- demonstrate values and attitude consistent with ethical and professional conduct.
- contribute to the future development of operation theatre technologist.

## Course Details

### A. Course Title: Diploma in Medical Technology Operation Theatre Assistant (OTA)

### B. Course Philosophy and rationale

The course of Operation Theatre Assistant (OTA) will help to develop skilled manpower in the operation theatre. OTA will play a vital role in OT services available in the hospital

### 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 3<sup>rd</sup> Year is eligible 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-1<sup>st</sup> year, 2<sup>nd</sup> year, 3<sup>rd</sup> year and 4<sup>th</sup> 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
1 <sup>st</sup> Year	12 months
2 <sup>nd</sup> Year	12 months
3 <sup>rd</sup> Year	12 months
4 <sup>th</sup> 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 7 years after admission in 1<sup>st</sup> year

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

**1<sup>st</sup> 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 Anatomy	70	60	70					200
	III	Basic Physiology	75	60	65					200
	IV	Basic Community Medicine & Behavioral science	150	50	-					200
	V	Basic computer science	25	-	75					100
		<b>Total</b>	<b>386</b>	<b>204</b>	<b>210</b>	<b>17 days</b>	<b>25 days</b>	<b>800</b>		
		<b>Grand total</b>	<b>800 hours</b>			<b>42 days</b>			<b>800 hours</b>	

**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	10days	10 days	15days	70
	II	Chemistry	80	20					100
	III	Basic Microbiology & Parasitology	80	20					100
	IV	Emergency Care	100	150					250
	V	Patient Assessment	100	200					300
		<b>Total</b>	<b>400</b>	<b>420</b>	<b>17 days</b>	<b>25 days</b>	<b>820</b>		
		<b>Grand total</b>	<b>820 hours</b>			<b>42 days</b>			<b>820 hours</b>

### 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	Preparation For Surgery	100	150	7 days	10 days	10 days	15 days	250
	II	Adjuncts To Surgery	100	150					250
	III	Basic Of Operation	100	150					250
		<b>Total</b>	<b>300</b>	<b>450</b>	17 days		25 days		750
		<b>Grand total</b>	<b>750 hours</b>		<b>42 days</b>				<b>750 hours</b>

### 4<sup>th</sup> 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	I	Post-Operative Care	100	150	150	7 days	10 days	10 days	15 days	400
	II	Special Surgery	100	150	150					400
		<b>Total</b>	<b>200</b>	<b>300</b>	<b>300</b>	17 days		25 days		<b>800</b>
		<b>Grand total</b>	<b>800 hours</b>			<b>42 days</b>				<b>800 hours</b>

## **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/laptop
  - 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 as per log book
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<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> & 4<sup>th</sup> 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 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> year Final examinations respectively.

### **Carry on**

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

<b>Numerical percentage of Marks</b>	<b>GPA letter Grade</b>	<b>GPA Numerical Grade (Grade points)</b>
85% and above	A <sup>+</sup>	4
81% to less than 85%	A	3.75
76% to less than 80%	A <sup>-</sup>	3.5
71% to less than 75%	B <sup>+</sup>	3.25
66% to less than 70%	B	3.00
61% to less than 65%	B <sup>-</sup>	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
IV	Basic Physiology	100	40	40	20	200
V	Basic Community Medicine & Behavioral Science	100	40	40	20	200
VI	Basic computer science	50	--	40	10	100
	<b>Total</b>	<b>425</b>	<b>135</b>	<b>160</b>	<b>80</b>	<b>800</b>

### 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	Emergency Care	100	40	40	20	200
V	Patient Assessment	100	40	40	20	200
	<b>Total</b>	<b>450</b>	<b>140</b>	<b>150</b>	<b>60</b>	<b>800</b>

### 3rd Year Examination

Paper	Subjects	Written Exam	Oral Exam	Practical Exam	Formative exam	Total Marks
I	Preparation For Surgery	100	40	40	20	200
II	Adjuncts To Surgery	100	40	40	20	200
III	Basic Of Operation	100	40	40	20	200
	<b>Total</b>	<b>300</b>	<b>120</b>	<b>120</b>	<b>60</b>	<b>600</b>

### 4<sup>th</sup> Year Examination

Paper	Subjects	Written Exam	Oral Exam	Practical Exam	Formative exam	Total Marks
II	Post-Operative Care	100	40	40	20	200
II	Special Surgery	100	40	40	20	200
	<i>Special Lab Attachment</i>					
	<b>Total</b>	<b>200</b>	<b>80</b>	<b>80</b>	<b>40</b>	<b>400</b>

**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 evaluate and how to evaluate
- 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

# 1<sup>st</sup> 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

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Tutorial
1.	<p><b>Text book: English for Today-Published by N.C.T.B. (Intermediate)</b></p> <p><b>Unit- Three: Learning English.</b></p> <ol style="list-style-type: none"> <li>1. Learning a language</li> <li>2. Why to learn English</li> <li>3. How to learn English</li> <li>4. Different learners, different ways</li> <li>5. Dealing with grammar</li> <li>6. Integrated skills development</li> <li>7. How to use dictionary</li> </ol> <p><b>Unit-Six: Our Environment.</b></p> <ol style="list-style-type: none"> <li>1. The environment and the ecosystem</li> <li>2. How the environment is polluted.</li> <li>3. The world is getting warmer.</li> <li>4. Let's not be cruel to them.</li> <li>5. Beware of pollution.</li> <li>6. Forests should stay.</li> <li>7. How to manage waste.</li> </ol> <p><b>Unit-Twenty-four: People, People Everywhere</b></p> <ol style="list-style-type: none"> <li>1. What's the problem?</li> <li>2. Kalim Majhee's boat.</li> <li>3. The rootless.</li> <li>4. Why is there discrimination?</li> <li>5-7. The Revenge.</li> </ol>	16	

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Tutorial
2.	<b>Grammar:</b> <b>Articles :</b> <ul style="list-style-type: none"> <li>▪ Indefinite &amp; definite articles</li> </ul> <b>Tense:</b> <ul style="list-style-type: none"> <li>▪ Present, Past &amp; Future tense</li> </ul> <b>Voice :</b> <ul style="list-style-type: none"> <li>▪ Active voice</li> <li>▪ Passive voice</li> <li>▪ Voice change</li> </ul> <b>Speeches:</b> <ul style="list-style-type: none"> <li>▪ Direct speeches</li> <li>▪ Indirect speeches</li> </ul> <b>Linkers</b> <ul style="list-style-type: none"> <li>▪ In addition</li> <li>▪ Besides</li> <li>▪ Moreover</li> <li>▪ However</li> <li>▪ Because</li> <li>▪ Either or , neither nor</li> </ul> <b>Idioms &amp; Phrases :</b> <b>Subjects &amp; predicate</b> <b>Parts of speech-</b> <ul style="list-style-type: none"> <li>▪ Noun &amp; its classification</li> <li>▪ Pronoun &amp; its classification</li> <li>▪ Adjective &amp; its classification</li> <li>▪ Verb-Adverb</li> </ul> <b>Conjugation</b> <b>Preposition</b> <b>Punctuation</b> (capitalization, fragment, end, comma, semi colon, colon, hyphen, underlining) <b>Spelling</b> <b>Wrong words</b> <b>Translation</b> (Bengali to English, English to Bengali), short story writing, technical description, comprehension.	22	
	<b>Paragraph writing :</b> <b>Letter writing:</b> <b>Application writing:</b> <b>Report writing :</b>	10	
	<b>Telegrams &amp; E-mail:</b>	2	

*Course Contents of English (Part -II)*

*Marks = 25+25*

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Tutorial
	<b>Communicative English :</b> <ul style="list-style-type: none"><li>▪ Reading skill</li><li>▪ Writing skill</li><li>▪ Listening skill</li><li>▪ Conversations skill</li></ul>	4 4 4 4	8 8 8 10
	<b>Total</b>	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**  
**Lecture: 70 hours**  
**Tutorial : 60 hours**  
**Practical/Demons: 70 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: -**

- 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.
- Perform 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.
- perform 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.	<b>Introductory Anatomy :</b> <b>a) Anatomical Terminologies :</b> i) Definition of Anatomy ii) Anterior, Posterior, superior, inferior, medial, lateral & median plane. <b>b) i) Systems of Human body</b> ii) Human cell: structure and classification. iii) Cell division: types. Phases of mitosis iv) Tissue: Types of tissues.	10	05	10
2.	<b>Musculoskeletal system:</b> ▪ component ▪ Types of bones & joints ▪ short description of important bones	10	10	05
3.	<b>Cardio-vascular system.</b> ▪ Location & Basic structure of cardiovascular system ▪ Short description of heart, major arteries, capillaries/veins	10	05	10
4.	<b>Respiratory system</b> ▪ 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.	<b>Gastro-intestinal and Hepatobiliary system:</b> <ul style="list-style-type: none"> <li>▪ Short description of the different parts of alimentary system: mouth, tongue, esophagus, stomach, small and large intestine, rectum &amp; anal canal</li> <li>▪ Anatomy of salivary glands, pancreas, liver, gall bladder</li> </ul>	10	10	10
6.	<b>Genito –urinary system:</b> <ul style="list-style-type: none"> <li>▪ Anatomy of urinary system</li> <li>▪ Male genital system:</li> <li>▪ Female genital system</li> </ul>	10	10	10
7.	<b>Nervous system and Endocrine system.</b> <ul style="list-style-type: none"> <li>▪ Basic structure of nervous system</li> <li>▪ Parts of nervous system and short description of brain, spinal cord, cranial nerves, peripheral nerves</li> <li>▪ Autonomous of nervous system and short description of sense organs-eye, ear, nose, throat, tongue and skin</li> <li>▪ Important endocrine glands</li> </ul>	12	12	10
8.	<b>Lymphatic System :</b> <ul style="list-style-type: none"> <li>▪ Anatomy of lymph nodes and vessels</li> </ul>	02	02	05
	<b>Total</b>	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/SOE-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.	<b>Introductory Physiology:</b> <ul style="list-style-type: none"> <li>▪ Physiological terminologies</li> <li>▪ Basic structure and organizations of human body</li> <li>▪ Cell physiology and metabolism/multiplication of living cells</li> <li>▪ General functions of different systems of the body: Musculoskeletal/Respiratory/ Circulatory/Digestive/Urinary/Nervous/ Endocrine/Immune/ Reproductive</li> </ul>	10	04	10
2.	<b>Musculoskeletal system :</b> <ul style="list-style-type: none"> <li>▪ Physiological components of musculoskeletal system</li> <li>▪ Functions of important muscles, bones &amp; joints of human body</li> <li>▪ Movements of joints</li> </ul>	10	10	05
3.	<b>Cardiovascular System:</b> <ul style="list-style-type: none"> <li>▪ Functions of circulatory system</li> <li>▪ Composition of Blood and their Functions</li> <li>▪ Conductive system of heart &amp; Cardiac cycle</li> <li>▪ Physiology of Blood Pressure</li> </ul>	10	05	10

Sl. No	Topics/Lessons	Teaching/learning Hours		
		Lecture	Tutorial	Practical/ Demonstration
4	<b>Respiratory system :</b> <ul style="list-style-type: none"> <li>▪ Functions of respiratory system</li> <li>▪ Mechanism of breathing</li> </ul>	05	05	10
5	<b>Digestive and hepatobiliary system:</b> <ul style="list-style-type: none"> <li>▪ Definition of digestion, absorption, metabolism</li> <li>▪ Digestion, absorption &amp; metabolism of carbohydrate, fat &amp; protein</li> <li>▪ Nutritional deficiency disorders : anemia, iodine deficiency, vitamin deficiencies</li> <li>▪ Functions of liver, pancreas and gall bladder</li> <li>▪ Composition &amp; functions of different digestive juices &amp; bile</li> </ul>	10	10	10
6	<b>Genitourinary system:</b> <ul style="list-style-type: none"> <li>▪ Functions of Kidney</li> <li>▪ Formation, appearance and composition of urine</li> <li>▪ Functions of reproductive organs of both sexes: uterus/ovary/fallopian tube/vagina/penis/testes/scrotum/vas deferens/prostate</li> </ul>	10	10	10
7	<b>Nervous system, organs of special sense:</b> <ul style="list-style-type: none"> <li>▪ Functions of motor, sympathetic &amp; parasympathetic nervous system</li> <li>▪ Functions of cranial nerves</li> <li>▪ Cerebrospinal fluid formation, composition &amp; function</li> <li>▪ Functions of special sense organs-eye, ear, nose, tongue and skin</li> <li>▪ Functions of the endocrine glands &amp; hormones secreted by them: Pituitary / thyroid / parathyroid / adrenal /gonads/pancreas/placenta</li> </ul>	12	10	10
8	<b>Immune System :</b> <ul style="list-style-type: none"> <li>▪ Definition/classification and components of immune system</li> <li>▪ Cells and tissues of immune system &amp; their functions</li> </ul>	05	05	
9	<b>Lymphatic System :</b> <ul style="list-style-type: none"> <li>▪ Structure &amp; functions of lymph nodes and vessels</li> </ul>	03 05	01	
	<b>Total</b>	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/SOE-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 programme 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 programme 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.	<b>Introductory community medicine:</b> <ul style="list-style-type: none"> <li>▪ Definition of Community Medicine</li> <li>▪ Concept of health : Definition / Dimensions / Spectrum / Determinants / Indicators</li> <li>▪ Concept of general principles for prevention and control of communicable and Non-communicable diseases</li> <li>▪ Concept of health promotion: Definition / Interventions</li> </ul>	16	10
2.	<b>Primary health care:</b> <ul style="list-style-type: none"> <li>▪ Definition/Elements/ Principles/Scope</li> </ul>	05	02
3.	<b>Health care services and organization:</b> <ul style="list-style-type: none"> <li>▪ Primary/Secondary/Tertiary Health Care services</li> <li>▪ WHO/UNDP/UNICEF/CARE/ International Red Crescent / BIRDEM / ICDDR,B</li> </ul>	06	02
4.	<b>Basic Epidemiology:</b> <ul style="list-style-type: none"> <li>▪ Definition /Aims/Methods/Scope</li> <li>▪ Definition of epidemiological terms eg. Epidemic/Endemic/Pandemic/Sporadic/ Zoonotic disease/ Incubation period/ period of communicability/ Epidemiological Triad/ Infection/ Contamination/ Infestation etc.</li> <li>▪ Major health programs in Bangladesh</li> <li>▪ Medical Information system (MIS)</li> </ul>	12	06
5.	<b>Basic Bio-statistics :</b> <ul style="list-style-type: none"> <li>▪ Definition /Scope/Functions/Importance and uses of Biostatistics, Medical statistics, Health statistics, Vital statistics</li> <li>▪ Definition of vital events</li> <li>▪ Definition/types/characteristics/functions/importance/sources/collection and presentation of data</li> <li>▪ Morbidity/Mortality/Fertility statistics</li> </ul>	17	04

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Practical/ Demonstration
6.	<b>Demography and family planning.</b> <ul style="list-style-type: none"> <li>▪ Demography: Definition/Focus/Process/Stages/Cycle and how to conduct census</li> <li>▪ Family Planning: Definition/ Objectives/ Scope/Health aspects/Benefits</li> <li>▪ Contraceptive methods: Short description /Advantages/Disadvantages/Indications/ Contraindications/ Complications</li> </ul>	12	04
7.	<b>Maternal and Child Health Care (MCH):</b> <ul style="list-style-type: none"> <li>▪ Introduction/Definition/Aims &amp; Objectives / Components of MCH</li> <li>▪ Maternal health care: Antenatal/Intra natal/Postnatal</li> <li>▪ Care of the New-born/Under 5 children</li> <li>▪ Indicators of MCH care: MMR, IMR etc</li> </ul>	10	
8.	<b>Food and nutrition:</b> <ul style="list-style-type: none"> <li>▪ Food: Definition/Functions/Classification</li> <li>▪ Sources/types/functions/daily requirements and deficiency of protein, fat, carbohydrate, vitamins and minerals</li> <li>▪ Definition of nutrition /Balanced Diet</li> <li>▪ Malnutrition: Definition/Forms/Causes and prevention</li> <li>▪ Common nutritional problems of Bangladesh: low Birth Weight/Protein Energy Malnutrition/ Nutritional Blindness/ Nutritional Anemia/ Lathyrism</li> </ul>	15	06
9.	<b>Occupational Health :</b> <ul style="list-style-type: none"> <li>▪ Occupational health : Definition /Objectives</li> <li>▪ Occupational Hazards: Introduction /Types</li> <li>▪ Occupational diseases: Definition/Classification/Prevention and control</li> </ul>	08	02
10.	<b>Health education behavioral science and Ethics:</b> <ul style="list-style-type: none"> <li>▪ Health Education: Definition/Importance / Objectives / Components/ Principles/Methods /Media</li> <li>▪ Communication Skills: Definition/Key elements /Barriers</li> <li>▪ Behavioral Science : Introduction &amp; concept</li> <li>▪ Ethics: Introduction and concept</li> </ul>	12	04

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Practical/ Demonstration
11.	<b>Environment and sanitation:</b> <ul style="list-style-type: none"> <li>▪ Definition of environment, pollution, sanitation and environmental sanitation</li> <li>▪ Water: Safe wholesome water/Source of water/water pollution/Hazards of water pollution /water borne diseases/Hardness of water/Purification of water</li> <li>▪ Air : Definition/Composition</li> <li>▪ Air pollution : Sources, pollutants, indicators, health &amp; other effects, prevention &amp; control</li> <li>▪ Ventilation: Definition/Standards/ Types/ Criteria of good ventilation / effects of good ventilation</li> <li>▪ Solid waste: Definition/Types/Sources/Health hazards</li> <li>▪ Disposal of solid waste: Dumping/Controlled tipping or sanitary land fill/ incineration/ composting/Manure pits/Burial</li> <li>▪ Excreta or night soil: Public health importance/Health hazards/how disease occurs from it/Sanitation Barrier/ Methods of excreta disposal (Unsewered area/Sewered area)</li> </ul>	25	04
12.	<b>First Aid :</b> <ul style="list-style-type: none"> <li>▪ Definition / Principles of First Aid</li> <li>▪ First Aid Box-List of contents and their uses</li> <li>▪ First Aid of : Cuts, bleeding, burn, shock, dog bite, snake bite</li> </ul>	12	06
	<b>Total</b>	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/SOE-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 software
- 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
- perform 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.	<p><b>Detailed Contents :</b></p> <p><b>Relevant Instruction for Practical :</b></p> <ul style="list-style-type: none"> <li>▪ Information Technology -its concept and scope</li> <li>▪ Computers for information storage, information seeking, information processing and information transmission</li> <li>▪ Elements of computer system - computer hardware and software: data -numeric data, numeric data; contents of program, processing</li> <li>▪ Computer organization, block diagram of a computer, CPU, memory</li> <li>▪ Input devices; keyboard, mouse etc; output devices; VDU and Printer, scanner, Plotter</li> <li>▪ Electrical requirements, inter-connections between units, connectors and cables</li> <li>▪ Secondary storage; magnetic disks-tracks and sectors, optical disk (CD and DVD Memory), primary and secondary memory: RAM, ROM, PROM etc.</li> <li>▪ Capacity; device controllers, serial port, parallel port system bus 47</li> <li>▪ Exercises on file opening and closing; memory management; device management; device management and input-output (I/O) management with respect of windows</li> <li>▪ Installation concept and precautions to be observed while installing the system and software</li> <li>▪ Introduction about Operating systems such as and Windows</li> <li>▪ Special features, various commands of MS word and MS- Excel, Power -point</li> <li>▪ About the internet-server types, connectivity (TCOP/IP, shell); applications of internet like: e-mail and browsing</li> <li>▪ Various Browsers like WWW (World wide web); hyperlinks; HTTP (Hyper Text Transfer Protocol); FTP (File Transfer Protocol)</li> <li>▪ Basic of Networking -LAN, WAN, Topologies</li> </ul>	25	
	<ul style="list-style-type: none"> <li>▪ Give a PC, name its various components and list their functions</li> <li>▪ Identification of various parts of a computer and peripherals</li> <li>▪ Practice in installing a computer system by giving connection and loading the system software and application software</li> <li>▪ Installation of DOS and simple exercises on TYPE, REN, DEL, CD, MD, COPY, TREE, BACKUP commands</li> <li>▪ Exercises on entering text and data (Typing Practice)</li> <li>▪ Installation of Windows 98 or 2000 etc.</li> <li>▪ Features of windows as an operating system</li> <li>▪ Start</li> <li>▪ Shutdown and restore</li> <li>▪ Creating and operating on the icons</li> <li>▪ Opening, closing and sizing the windows</li> <li>▪ Using elementary job commands like-creating, saving, modifying, finding and deleting a file</li> <li>▪ Creating and operating on a folder</li> <li>▪ Changing setting like, date, time color (back ground and fore ground)</li> <li>▪ Using short cuts</li> <li>▪ Using on line help</li> </ul>		

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Tutorial/ Practical
	<ul style="list-style-type: none"> <li>▪ MS-WORD</li> <li>▪ 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</li> <li>▪ Page set up : Setting margins, tab setting, ruler, indenting</li> <li>▪ Editing a document : Entering text, Cut, copy, paste using tool-bars</li> <li>▪ 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</li> <li>▪ Aligning of text in document, justification of document, Inserting bullets and numbering :</li> <li>▪ Formatting paragraph, inserting page breaks and column breaks</li> <li>▪ Use of headers, footers: Inserting footnote, end note, use of comments</li> <li>▪ Inserting date, time, special symbols, importing graphic images, drawing tools</li> <li>▪ 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</li> <li>▪ Print preview, zoom, page set up, printing options</li> <li>▪ Using Find, Replace options</li> <li>▪ Using Tools like: Spell checker, help, use of macros, mail merge, word content and statistics, printing envelopes</li> <li>▪ Using shapes and drawing toolbar</li> <li>▪ Working with more than one window in MS Word,</li> <li>▪ How to change the version of the document from one window OS to another</li> <li>▪ Conversion between different text editors, software and MS word</li> </ul>		30

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture	Tutorial/ Practical
	<p><b>MS -Excel :</b></p> <ul style="list-style-type: none"> <li>▪ Starting excel, open worksheet, enter, edit, data, formulas to calculate values, format data, create chart, printing chart, save worksheet, switching from another spread sheet</li> <li>▪ <b>Menu Commands :</b> Create, format charts, organize, manage data, solving problem by analyzing data, exchange with other applications. Programming with MS Excel, getting information while working</li> <li>▪ <b>Work Books :</b> 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</li> <li>▪ Editing a worksheet, copying, moving cells, pasting, inserting, deleting cells, rows, columns, find and replace text, numbers of cells, formatting worksheet :</li> <li>▪ <b>Creating a chart :</b> Working with chart types, changing data in chart, formatting a chart, use chart to analyze data</li> <li>▪ <b>Using a list to organize data, sorting and filtering data in list</b></li> <li>▪ <b>Retrieve data with MS -Query: Create a pivot table, customizing a pivot table. Statistical analysis of data.</b></li> <li>▪ <b>Customize MS-Excel:</b> How to change view of worksheet, outlining a worksheet, customize workspace, using templates to create default workbooks, protecting work</li> <li>▪ <b>Exchange data with other application: linking and embedding, embedding objects, linking to other applications, import, export document</b></li> </ul>		20
	<p><b>Power Point :</b></p> <ul style="list-style-type: none"> <li>▪ Making Slide following the rules &amp; principles</li> <li>▪ Slide Projection</li> </ul>		10
	<p><b>Internet and its Applications :</b></p> <ul style="list-style-type: none"> <li>▪ Log -in to internet</li> <li>▪ Navigation for information seeking on internet</li> <li>▪ Browsing and down loading of information from internet</li> <li>▪ Sending and receiving e-mail</li> <li>▪ Creating a message</li> <li>▪ Creating and address book</li> <li>▪ Attaching a file with e-mail message</li> <li>▪ Receiving a message</li> <li>▪ Deleting message</li> </ul>		15
	<b>Total=</b>	<b>25</b>	<b>75</b>

**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

## 2<sup>nd</sup> 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 the 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 the 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।	<b>বলবিদ্যা ও পদার্থের ধর্ম :</b> ➤ সরল রেখার গতি, গতির সমীকরণ, নিউটনের গতির সূত্র ভ্রমণ ও বল, খাত বল, ভেকটর ও সেলের রাশি। ➤ কৌণিক গতি, কৌণিক বেগ ও ভ্রমণ 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।	<b>তাপ :</b> তাপমিতি, তাপের একক, আপেক্ষিক তাপ, তাপীয় ক্ষমতা পানিসমতাপ ও সুপ্ততাপ এবং হাঁহাদের নির্ণয় পদ্ধতিঃ সরলীয় পদ্ধতিতে তাপের পরিবাহিতা নির্ণয়।	৫ ঘন্টা	

৩।	<b>শব্দ :</b> <ul style="list-style-type: none"> <li>➤ শব্দের উৎপত্তি ও শব্দ সাধন, আড় তরঙ্গ ও দীঘল তরঙ্গ শব্দের ব্যভিচার ও বীট। বীটের সাহায্যে কম্পন সংখ্যা নির্ণয়।</li> <li>➤ শব্দের বেগ নির্ণয়।</li> <li>➤ টানা তারের আড় কম্পন, সূত্রের প্রমাণ।</li> </ul>	৫ ঘন্টা	
৪।	<b>আলোক :</b> <ul style="list-style-type: none"> <li>➤ গোলীয় পৃষ্ঠে প্রতিফলন।</li> <li>➤ সমতল ও গোলীয় পৃষ্ঠে প্রতিফলন। সম্পূর্ণ প্রতিফলন, প্রতিসরাংক, প্রিজম প্রতিসারণ।</li> <li>➤ লেন্সঃ উত্তল ও অবতল লেন্স। লেন্সের শক্তি ও বিবর্ধন লেন্স সংযোজন। চোখের ত্রুটি সমূহ ও প্রতিকার।</li> <li>➤ আলোক যন্ত্র-মাইক্রোস্কোপ।</li> </ul>	৫ ঘন্টা	
৫।	<b>চুম্বক :</b> <ul style="list-style-type: none"> <li>➤ চুম্বকনের বিভিন্ন পদ্ধতিঃ চুম্বকের মতবাদ, চুম্বকের ক্ষেত্র ও প্রাবল্য। বিপরীত বর্গীয় সূত্র প্রান্তমুখী ও প্রস্থমুখী অবস্থানে চুম্বকের প্রাবল্য। বিক্ষিপী চুম্বকমান যন্ত্র ও ইহার ব্যবহার।</li> <li>➤ ভূচুম্বকত্ব।</li> </ul>	৪ ঘন্টা	
৬।	<b>তড়িৎ :</b> <ul style="list-style-type: none"> <li>➤ স্থির তরিৎ, চার্জের অস্তিত্ব ও প্রকৃতি নির্ণয়। বৈদ্যুতিক আবেশ, কুলম্বের সূত্র, ধারকত্ব, তড়িৎ বিভব। সমান্তরাল পাত ধারক।</li> <li>➤ বিদ্যুৎ কোষ, তাদের কেন্দ্রে উৎপন্ন চুম্বকক্ষেত্র। বিদ্যুৎ প্রবাহ ও চার্জের একক।</li> <li>➤ ওহমের সূত্র, বিভব বৈষম্যের একক। রোধ ও আপেক্ষিক রোধ, রোধের একক, রোধ সংযোজন, এমিটার, ভোল্ট মিটার।</li> <li>➤ বৈদ্যুতিক পরিমাপ, হুইট স্টেম ব্রিজ, মিটার ব্রিজ, পোস্ট অফিস বক্স ও পাটেন শিও মিটার।</li> <li>➤ তড়িৎ প্রবাহ ও উত্তাপ, জুলের সূত্র, বৈদ্যুতিক পদ্ধতিতে নির্ণয়।</li> <li>➤ তড়িৎ প্রবাহে রাসায়নিক ক্রিয়া, তড়িৎ বিশেষণ, সূত্র ও ইহাদের প্রমাণ।</li> <li>➤ তড়িৎ চুম্বকীয় আবেশ।</li> </ul>	১৩ ঘন্টা	
	ব্যবহারিক	৪০	

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

মান বন্টন : তত্ত্বীয় = ৬০

- ১। পদার্থের সাধারণ ধর্ম, আলোক ও তড়িৎ 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।

$$8 \times 1 \times 3 = 24$$

$$4 \times 1 \times 3 = 12$$

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

$$4 \times 2 \times 3 = 24$$

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 : তত্ত্বীয়+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 processes.
- 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 processes.
- 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
	<b>গ্রুপ- ক ভৌত রসায়ন</b>		
১।	ভৌত ও রাসায়নিক পরিবর্তন ও এদের মধ্যে পার্থক্য।	১ ঘন্টা	
২।	পদার্থের গঠনঃ অণু ও পরমাণু-অণুর সংজ্ঞা, আন্তঃআণবিক দূরত্ব, আন্তঃআণবিক, কঠিন, তরল, গ্যাস, পরমাণু, পারমাণবিক 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 রাসায়িক 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। বিভিন্ন রাসায়নিক বন্ধন।	২ ঘন্টা ২ ঘন্টা	
১০।	ক) এভোগ্যাড্রে সূত্র খ) ভরক্রিয়া সূত্র।		
১১।	রাসায়নিক সংযোগ বিধিঃ ক) ভরের নিত্যতা সূত্র।      খ) নির্দিষ্ট অনুপাত সূত্র। গ) গুণানুপাত বিধি।      ঘ) বিপরীত অনুপাত সূত্র। ঙ) গ্যাস আয়তন সূত্র।	৪ ঘন্টা ২ ঘন্টা ৫ ঘন্টা	
	<b>গ্রুপ-খ অধাতুঃ</b>		

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 সমূহঃ ক্লোরিন, রোমিন, আয়োডিন ও হাইড্রো ক্লোরিক এসিড।		
গ)	নাইট্রোজেন, হাইড্রোজেন সালফাইড, সালফার ডাইঅক্সাইড।		
ঘ)	সালফার, হাইড্রোজেন সালফাইড, সালফার ডাইঅক্সাইড, সালফিউরিক এসিড।		
ঙ)	ফসফরাস চ) জারন-বিজারনঃ জারক ও বিজারক পদার্থ		
২।	ধাতুঃ নিম্নোক্ত পদার্থ গুলোর উৎস, প্রস্তুতি, ধর্ম এবং ব্যবহারঃ	৬ ঘন্টা	
ক)	সোডিয়াম-সোডিয়াম হাইড্রোঅক্সাইড, সোডিয়াম কার্বনেট, সোডিয়াম ক্লোরাইড।		
খ)	ক্যালসিয়াম-ক্যালসিয়াম কার্বনেট, ক্যালসিয়াম ফ্লোরাইড, ক্যালসিয়াম সালফেট, বিচিং পাউডার।	১ ঘন্টা	
৩।	কপার -কপার অক্সাইড, কপার সালফেট, কপার ক্লোরাইড	১ ঘন্টা	
৪।	জিংক - জিংক অক্সাইড, জিংক ফ্লোরাইড, জিংক সালফেট।		
৫।	এলুমিনিয়াম - এলুমিনিয়াম ক্লোরাইড, এলুমিনিয়াম সালফেট।	১ ঘন্টা	
৬।	আয়রন - আয়রন সালফেট।	১ ঘন্টা	
৭।	লেড - লেড অক্সাইড।	১ ঘন্টা	
৮।	সিলভার - সিলভার নাইট্রেট।	১ ঘন্টা	
	<b>গ্রুপ- গ জৈব রসায়ন</b>		
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 হ্যালাজেন 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, ফরমালডিহাইড, এসিটালডিহাইড ও এসিটোন।	৩ ঘন্টা	
৮।	কার্বিলিক এসিডঃ এসেটিক এসিড ও সাইট্রিক এসিডের 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, কার্বিলিক এসিড, বেনজালডিহাইড, বেনজোয়িক এসিড ও স্যালিসাইলিক এসিড।	৪ ঘন্টা	
	<b>ব্যবহারিক :</b>		
১।	অম্ল ও ক্ষারের মাত্রা নির্ণয়।		২০ ঘন্টা
২।	হাইড্রোজেন ও অক্সিজেনের প্রস্তুতি।		
৩।	সহজ জৈব ও অজৈব যৌগের আঙ্গিক বিশেষণ।		
	<b>মোটঃ ১০০ ঘন্টা</b>	৮০ ঘন্টা	২০ ঘন্টা

মান বন্টনঃ লিখিত পরীক্ষা=৭৫ মার্কস, ব্যবহারিক = ১৫ মার্কস, 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 প্রত্যেক 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**

### **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 of bacteria and bacterial spores: pathogenicity of medically important bacteria, growth & multiplication of bacteria.
- identify, staining and culture of medically important bacteria.
- mention knowledge about personal protective equipment (PPE)
- demonstrate basic knowledge of immunity.

### **List of Competencies:**

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

*Course Contents of Basic Microbiology & Parasitology*

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture / Tutorial on Theories	Practical/ Demonstration/Field visit
1.	<b>Introduction to microorganisms:</b> <ul style="list-style-type: none"> <li>▪ Definition and classification of microorganisms</li> <li>▪ Microbiological terminology</li> <li>▪ Characteristics of Eukaryotic prokaryotic &amp; sub cellular groups of microorganisms</li> <li>▪ Microbiological articles, equipment's apparatus</li> <li>▪ Microscope: Different parts of microscope, &amp; maintenance of microscope</li> </ul>	08	03
2.	<b>Destruction of microorganism:</b> <ul style="list-style-type: none"> <li>▪ Cleaning, Washing, decontamination disinfection &amp; procedures</li> <li>▪ Sterilization of different laboratory articles, instruments, glass wares etc.</li> </ul>	07	03
3.	<b>Bacteria:</b> <ul style="list-style-type: none"> <li>▪ Anatomy of Bacteria, chemical composition of different structures of bacteria</li> <li>▪ Bacterial Spore: Definition &amp; function spores, Spores bearing bacteria of medical importance</li> <li>▪ Bacterial toxin: Definition &amp; types of bacterial toxin, characteristics of endotoxin &amp; exotoxin, Toxin producing organism of medical importance, use of bacterial toxins in diseases prevention &amp; treatment</li> <li>▪ Biology of bacteria: Growth &amp; multiplication of bacteria, bacteria growth curve, bacteria growth requirements. Definition &amp; classification of culture media</li> <li>▪ Classifying bacteria in terms of morphology, staining, spore, flagella, capsule &amp; Pathogenicity.</li> <li>▪ Staining bacteria: Gram's staining, AFB staining, Albert staining</li> </ul>	15	04
	<b>Virus:</b> <ul style="list-style-type: none"> <li>▪ General characters of virus</li> <li>▪ Morphology &amp; classification of virus</li> <li>▪ List of viruses of medical importance &amp; diseases produced by them</li> </ul>	10	01

Sl. No	Topics/Lessons	Teaching/learning Hours	
		Lecture / Tutorial on Theories	Practical/ Demonstration /Field visit
	<b>Fungus:</b> <ul style="list-style-type: none"> <li>▪ General character, Morphology and classification of fungus</li> <li>▪ List of fungus based on list medical important and the diseases produced by them</li> </ul>	10	02
	<b>Parasite:</b> <ul style="list-style-type: none"> <li>▪ Definition /Classification of parasite</li> </ul>	03	01
	<b>Helminth:</b> <ul style="list-style-type: none"> <li>▪ General characteristics of helminths</li> <li>▪ Classification /Morphology of helminths</li> </ul>	08	02
	<b>Protozoa:</b> <ul style="list-style-type: none"> <li>▪ General characteristics of protozoa</li> <li>▪ Definition /Classification of protozoa</li> </ul>	10	02
	<b>PPE:</b> <i>Personal protective equipment (PPE)</i> for different healthcare activities	04	01
	<b>Immunity:</b> <b>Basic Concept of immunity and immunization Schedule.</b>	05	01
	<b>Total</b>	<b>80</b>	<b>20</b>

#### 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/SOE-40 marks, Formative-20 marks

## Paper IV: Emergency Care

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

**Total Marks – 200**  
**Written – 100**  
**Practical – 40**  
**Oral -40**  
**Formative – 20**

### Objectives:

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

- resuscitation - Primary survey & secondary survey.
- trauma – Biomechanics of injury, metabolic response to injury, different types of trauma.
- maintain skillfully various equipment used for emergency care.
- to assist in various diagnostic, therapeutic and surgical procedures.

### List of Competencies:

Ability to--

- describe the etiology, pathophysiology and diagnostic assessment of patients, who need emergency operation.
- describe the various drugs used in emergency care and the OTA's /nurse's responsibility.
- demonstrate advanced skills/ competence in managing surgical emergency patients .
- maintain skillfully various equipment used for emergency care.
- apply nursing process in the care of emergency patients.
- enhance team work and coordinate activities related to patient care.

### Course content

S/No	Topics /Lessons	Teaching/learning hours	
		Theory	Practical/ Demo
1	Primary survey with initial resuscitation	10	10
2	The secondary Survey: Determining the cause of the patients collapse	10	10
3	Biomechanics of injury – blunt, penetrating, blast	10	10
4	Metabolic response to injury	5	10
5	Hemorrhage and shock	10	10
6	Cardiac arrest, CPR	10	10
7	Coagulopathy	5	10
8	Fractures – its classification	5	10
9	First aid for fracture & splints	5	10
10	Treatment of compound fractures	5	10
11	Mass casualty, triage	5	10
12	Chest and abdominal wound	5	10

13	Head injury – types, fluid therapy, treatment	5	10
14	Burns – types, fluid therapy, treatment, burn dressing	5	10
15	Electrolyte imbalance – Cause and management	5	10
<b>Total :</b>		<b>100</b>	<b>150</b>

**CLASS PERFORMANCE RECORDS**  
**Emergency Care (OPERATION THEATRE TECHNOLOGY COURSE)**  
**2<sup>nd</sup> YEAR**

S/No	Topics/Lessons	Date	Marks obtained	Signature of the Teacher
1.	Primary and secondary survey with initial resuscitation			
2.	Biomechanics of injury – blunt, penetrating, blast			
4.	Hemorrhage and shock			
5.	Cardiac arrest, CPR			
6.	Coagulopathy			
7.	Fractures			
8.	Mass casualty, triage			
9.	Chest and abdominal wound			
10	Head injury – types, fluid therapy, treatment			
11	Burns – types, fluid therapy, treatment, burn dressing			
12.	Electrolyte imbalance – Cause and management			
	Average marks secured 20%=			

**Assessment:**

Written – SAQ= 80 marks, MCQ=20 marks

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

## Paper-V: Patient Assessment

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

**Total Marks – 200**  
**Written – 100**  
**Practical – 80**  
**Formative – 20**

### Objectives:

At the end of the course on Patient Assessment, students should be able to

- Communication skills
- Clinical history and examinations
- Relevant investigations
- Influence of co-existing diseases
- Intravenous fluids
- Blood and blood products
- Clinical pharmacology

### List of Competencies:

#### At the end of core subject

Ability to--

- Effective communication strategies when interacting with patient of different types, their families, and other members of the health care team.
- Assist in various diagnostic, therapeutic and surgical procedures.
- Play role in critical care services (Exhibits initiative, motivation, and interest related to critical care experiences and care assignments.)
- Demonstrate honesty and integrity in all activities.
- Maintain patient confidentiality at all times.
- Counsel the patient and as well as attendant.
- Practice the ethical and legal issues when caring for critically ill patients.

### Course Content

S/No	Topics /Lessons	Teaching/learning hours	
		Theory	Practical/ Demo
1	Communication skills and telephone etiquette – breaking bad news	5	10
2	Clinical history and examinations	5	40
3	Practical use of common investigations.	15	20
4	Imaging techniques- X-ray, USG, CT scan, MRI, Nuclear medicine	15	30
5	Influence of co-existing diseases- Cardiovascular disease, Respiratory disease, Endocrine, Renal, Blood disorder, Surgery in elderly.	25	20
6	Intravenous fluids – Crystalloids, Colloids	10	30
7	Blood and blood products	10	30

<b>8</b>	<b>Clinical pharmacology-</b> Drugs in the young and old Drugs in pregnancy Drug usage in disease Drug interactions Drugs commonly use in OT	<b>15</b>	<b>20</b>
	<b>Total:</b>	<b>100</b>	<b>200</b>

**CLASS PERFORMANCE RECORDS**  
**Patient Assessment**  
**(OPERATION THEATRE TECHNOLOGY COURSE)**  
**2<sup>nd</sup> YEAR**

<b>S/No</b>	<b>Topics/Lessons</b>	<b>Date</b>	<b>Marks obtained</b>	<b>Signature of the Teacher</b>
1	Communication skills and telephone etiquette			
2	Clinical history and examinations			
3	Practical use of common investigations.			
4	Imaging techniques- X-ray, USG, CT scan, MRI, Nuclear medicine			
6	Intravenous fluids – Crystalloids, Colloids			
7	Blood and blood products			
	Average marks secured 20%=			

**Assessment:**

Written – SAQ= 80 marks, MCQ=20 marks

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

## 3<sup>rd</sup> Year

### Paper I: Preparations for surgery

**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 of Preparations for surgery, the students should be able to

- prepare patients for surgery
- follow instructions for premedication and anaesthesia
- maintain operating theatres and special equipments use in OT
- assist in operation theatre anesthesia and analgesia

#### List of Competencies

##### At the end of the course

- describe the general function and set up of each clinical setting.
- explain the roles and responsibilities of working in different operation theater setting.
- discuss the assessment and treatment priorities before surgery.
- identify emergency equipment used in various situations.
- demonstrate proper use of emergency equipment.
- identify and monitor normal and abnormal diagnostic tests.
- sufficient knowledge on premedication and anaesthesia.
- provide necessary assistance in operation theatre anesthesia.
- provide required assistance during the use of medicines in operation theater.

#### Course Content

S/No	Topics /Lessons	Teaching/learning hours	
		Theory	Practical/ Demo
1.	The operation theatre, OT tables and OT lights	10	15
2.	Universal precaution for Surgery	5	15
3.	Special equipment in the operating theatre – tourniquet, diathermy, lasers, Fibre optics in theatre, cryosurgery, ultrasound and X-ray/C-arm in theatre, microscopes in theatre – maintenance	25	40
4.	Prophylaxis against deep vein thrombosis	5	5
5.	Management of high risk patients – CVS, Respiratory, Endocrine	10	10
6.	Preparation for surgery of specific patient group – Large bowel surgery and Jaundiced patient, Patients suffering from	15	15

	Diabetes, Hypertension, Bronchial asthma.		
7.	Premedication	10	10
8.	Types of anaesthesia	10	10
9.	General anaesthesia - Induction, maintenance, recovery.	5	15
10.	Regional anaesthesia - Epidural anaesthesia, Spinal anaesthesia	5	15
<b>Total:</b>		<b>100</b>	<b>150</b>

#### Teaching Methods

- Lecture  
Practical demonstration

#### Media:

Multi media  
Laptop  
OHP  
White board/Marker  
Black/board  
Models/dummies  
Laboratory

#### Assessment:

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

### CLASS PERFORMANCE RECORDS

#### Preparations for surgery

#### (DIPLOMA IN OPERATION THEATRE TECHNOLOGY COURSE)

#### 3<sup>rd</sup> YEAR

S/No	Topics/Lesson	Date	Marks obtained	Signature of the Teacher
1	Prophylaxis against deep vein thrombosis			
2	Management of high risk patients			
3	Preparation for surgery of specific patient group			
4	Premedication and anaesthesia			
5	The operation theatre and OT table			
6	Special equipments in OT			
	Average marks secured 20%=			

## Paper II: Adjuncts to Surgery

**Total 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 of Adjuncts to Surgery the students should be able to-

- acquire knowledge of sterilization
- acquire knowledge of surgical instruments and their maintenance
- state the control of resistant organisms
- describe asepsis and antisepsis
- acquire knowledge of nosocomial transmission of infectious agents
- acquire knowledge of safety from fire hazards
- describe /identify the basic principles of surgical Aseptic Technique including the association of Operating Room Nurses Standards of Care and the methods of sterilization and disinfection.
- identify potential surgical hazards and safety measures to prevent injury including patient and occupation related hazards.

### List of Competencies:

#### At the end of Adjuncts to Surgery

- Knowledge on the basic principles of surgical Aseptic Technique including the association of Operating Room
- Standards of Care and the methods of sterilization and disinfection.
- Identify the basic nursing functions related to intraoperative care including positioning and surgical skin preparation for the surgical patient.
- Identify the principles and standards related to the establishment and maintenance of the sterile field as a non-sterile member of the team.
- Acquire knowledge of surgical instruments and their maintenance.
- Sufficient knowledge of nosocomial transmission of infectious agents and how to control the infection.
- The OTAs will have to identify potential surgical hazards and safety measures to prevent injury including patient and occupation related hazards.

### Course Content

S/No	Topics /Lessons	Teaching/learning hours	
		Theory	Practical/ Demo
1	Central Surgical Supply department (CSSD)	5	10
2	Sterilization – types, Autoclave, chemical sterilization, sterilization of different items, Asepsis and antisepsis	20	25
3	Surgical instruments and their maintenance	20	30
4	Ligature, sutures, staples and clips	5	10
5	Swabs and packs, Endoscopes, Implant materials	5	10
7	Theatre clothing- gowns, masks, eye protection, hair & beards, foot wear, gloves, Theatre air	15	15

8	Preparation of the surgeon- scrubbing up Preparation of the patient	10	15
9	Cleaning and disinfection, Surgical technique, Use of prophylactic antibiotics	10	15
10	The risks of nosocomial transmission – of infectious agents source of infection, risks of infection, reducing the risks of infection, infected health care worker.	5	10
11	Fire and safety – Source of fire, prevention.	5	10
<b>Total:</b>		<b>100</b>	<b>150</b>

#### Teaching Methods

1. Lecture
2. Practical demonstration

#### Media:

Multi media  
Laptop  
OHP  
White board/Marker  
Laboratory

#### Assessment:

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

### CLASS PERFORMANCE RECORDS

#### Adjuncts to Surgery (DIPLOMA IN OPERATION THEATRE TECHNOLOGY COURSE) 3<sup>rd</sup> YEAR

S/No	Topics/Lessons	Date	Marks obtained	Signature of the Teacher
1	Sterilization			
2	Surgical instruments and their maintenance			
3	Ligature, suture, staples and clips			
4	Endoscopes			
5	Implant materials			
6	Control of resistant organisms, Asepsis and antisepsis			
7	Risk of nosocomial virus transmission			
8	Fire and safety			

## Paper III : Basics of Operation

**Total 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 of Basics of Operation, the students should be able to

- describe surgical access, incisions and management of wounds.
- discuss minimal access surgery
- mention day case surgery
- state principles of skin cover
- describe transplantation
- narrate principles of surgery for malignant diseases.

### List of Competencies

Ability to—

- adequate practical knowledge to describe surgical access, incisions and management of wounds.
- identify, interpret and discuss minimal access surgery
- state principles of skin cover
- monitor patients and follow protocols for transplantation
- recognize indications and management of the patients requiring surgery for malignant diseases.
- participate in performing the primary and secondary survey of a trauma or burn patient.
- describe how ABCDE is used in thoroughly assessing the trauma patient for abnormal findings.
- assist in performing emergent interventions for patients with abnormal assessment findings e.g., intubation, fluid resuscitation, preparation for surgery.

### TRAUMA/BURN

Ability to--

### Course content

S/No	Topics /Lessons	Teaching/learning hours	
		Theory	Practical/ Demo
1	Surgical access and incisions, Precautions against loss of instruments or swabs	10	10
2	Skin closure, Surgical dressing	10	10
3	Preparation of trolley for different operations	10	40
4	Boundaries of minimal access surgery	5	10
5	Surgical trauma in open and laparoscopic surgery	10	20

<b>6</b>	Disadvantage of minimal access surgery, Future of minimal access surgery	10	20
<b>7</b>	Day case surgery	10	10
<b>8</b>	Principles of wound management, Conservative management	10	10
<b>9</b>	Skin grafts/ flaps /tissue expansion	10	10
<b>10</b>	Transplantation	5	5
<b>11</b>	Principles of surgery for malignant disease.	5	5
<b>12</b>	Surgical safety check-list	5	
<b>Total:</b>		<b>100</b>	<b>150</b>

## CLASS PERFORMANCE RECORDS

**Basics of Operation**  
**(DIPLOMA IN OPERATION THEATRE TECHNOLOGY COURSE)**  
**3<sup>rd</sup> YEAR**

<b>S/No</b>	<b>Topics/Lessons</b>	<b>Date</b>	<b>Marks obtained</b>	<b>Signature of the Teacher</b>
1.	Surgical access, incisions and the management of wounds.			
2.	Minimal access surgery			
3.	Day case surgery			
4.	Principles of skin cover			
5.	Transplantation			
6.	Principle of surgery for malignant disease			
	Average marks secured 20%=			

**Assessment:**

Written – SAQ= 80 marks, MCQ=20 marks

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

## 4<sup>th</sup> year

### Paper I: Post Operative Care

**Total 400 hours**

**Lecture: 100 hours**

**Practical: 150 hours**

**Special Lab Attachment : 150**

**Total Marks – 200**

**Written – 100**

**Oral -40**

**Practical – 40**

**Formative – 20**

#### Objectives

At the end of the course of Post Operative Care, the students should be able to

- describe wound healing
- narrate surgical drains
- state the management of post operative pain
- acquire the knowledge of post operative complications – prevention and management.
- enhance team work and coordinate activities related to patient care.
- practice infection control measures.
- assess and manage pain.
- identify the sources of stress and manage burnout syndrome among health care providers

#### List of Competencies

##### At the end of course

Ability to—

- manage and handle efficiently different types of wound.
- handle and narrate efficiently the surgical drains.
- state the management of post operative pain
- apply nursing process in the care of post operative complications, with prevention and management
- enhance team work and coordinate activities related to patient care
- demonstrate advanced skills/ competence in practicing infection control measures
- apply nursing process in the assess and manage pain
- identify the sources of stress and manage burnout syndrome among health care providers
- describe the various drugs used in post operative care and reised complications.

#### Course content

S/No	Topics /Lessons	Teaching/learning hours	
		Theory	Practical/ Demo
1	Healing by primary intention, Healing by secondary intention	10	10
2	Factors affecting wound healing	10	10
3	Surgical drains	20	30
4	Methods available to treat postoperative pain.	10	15

<b>5</b>	Post operative nausea and vomiting.	10	15
<b>6</b>	Post operative complications – Risk factors, Drug therapy	10	10
<b>7</b>	Post operative venous thrombosis	5	20
<b>8</b>	Post operative respiratory complications	10	20
<b>9</b>	Post operative infection: Prevention and management	15	20
	Total:	<b>100</b>	<b>150</b>

## Post Operative Care

### (OPERATION THEATRE TECHNOLOGY COURSE)

S/No	Topics/Lessons	Date	Marks obtained	Signature of the Teacher
1.	Wound healing			
2.	Surgical drains			
3.	Management of post operative pain			
4.	Venous thrombosis			
5.	Respiratory complications			
6.	Post operative infection			

#### **Assessment:**

Written – SAQ= 80 marks, MCQ=20 marks

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

## Paper II: Special Surgery

**Total 400 hours**

**Lecture: 100 hours**

**Practical: 150 hours**

**Special Lab Attachment: 150**

**Total Marks – 200**

**Written – 100**

**Oral -40**

**Practical – 40**

**Formative – 20**

### Objectives:

At the end of the course of Special Surgery, the students should be able to

- acquire basic knowledge of ophthalmology
- acquire basic knowledge of otorhinolaryngology
- acquire basic knowledge of gynaecology & obstetrics
- acquire basic knowledge of dentistry

### List of Competencies:

#### At the end of course

- assist or Perform and organize needful nursing management of various surgical emergencies
- provide nursing care before and after different special surgeries
- provide basic nursing knowledge on management of ophthalmological, otorhinolaryngological, gynaecological operative procedures
- assist in various diagnostic, therapeutic and surgical procedures of different special surgical procedures
- determine the availability of existing programs needed to manage the care of the dental surgical patient in collaboration with other health team members
- incorporate the nursing process in the care of the special surgeries

### Course content

S/No	Topics /Lessons	Teaching/learning hours	
		Theory	Practical/ Demo
1	Common eye diseases and their treatment	15	(10) 5
2	Special instruments of eye surgery	5	(20) 10
3	Eye injury and its treatment.	5	(10) 5
4	Epistaxis and its treatment	5	5
5	FB in respiratory tract and alimentary tract	5	5
6	Tonsillectomy – procedure, complications	5	10
7	Tracheostomy- procedure, care, complications	5	10
8	Special instruments of ENT surgery	5	10
9	Urethral catheterization and dilatation	10	15
10	Vascular access	5	5
11	Special instruments in dental surgery	10	10
12	Caesarean section- procedure, complications	5	10
13	D & C- procedure, complications	5	10
14	Special instruments in Gynaecology & obstetrics	15	20
	Total	<b>100</b>	<b>150</b>

**CLASS PERFORMANCE RECORDS**

**Special Surgery**  
**(OPERATION THEATRE CARE TECHNOLOGY COURSE)**

<b>S/No</b>	<b>Topics/Lessons</b>	<b>Date</b>	<b>Marks obtained</b>	<b>Signature of the Teacher</b>
1.	Common eye diseases and their treatment			
2.	Special instruments of eye surgery			
3.	Epistaxis, Tonsillectomy			
4.	FB in respiratory and alimentary tract			
5.	Special instruments of ENT surgery			
6.	D & C, Caesarean section			
7.	Special instruments of gynaecology			
	Average marks secured 20%=			

**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**

### **Instruments for Academic Institutional Laboratory**

1. Cutting and dissecting instruments - Scalpels, Surgical blades, scissors.
2. Draping materials – Draping sheets, Towel clamp.
3. Grasping or holding instruments - clamps.
4. Hemostatic instruments- Cautery/ Diathermia.
5. Tissue unifying instruments and materials – forceps: Dissecting forceps, tissue forceps, Kelly forceps, Mosquito forceps.
6. Stitching materials – Surgical needles, Needle holder, suture materials
7. Suction accessories – Suction machine.
8. Retract orifices – Speculum
9. Throat examination - Tongue depressor.
10. Surgical sponge.
11. Instruments used in obstetrics or Cesarean section and abdominal surgery– Doyen's retractor, Morris retractor, Deaver retractor
12. Instruments used in Gynae Operations - Cusco's self-retaining bivalve vaginal speculum, Sim's double-bladed vaginal speculum.
13. Airway tube.
14. AMBU bag (Artificial Manual Breathing Unit).
15. Laryngoscope.
16. Endotracheal tube.
17. Nasogastric tube.
18. Instrument tray.
19. Kidney tray.
20. Infusion set.
21. Transfusion set.
22. Disposable syringe.
23. Catheter.
24. Nasal cannula.
25. Stethoscope.
26. Blood pressure machine.
27. Gloves and gowns.
28. Face mask.
29. Saline - 5%DA, DNS, Junior saline, Baby saline, NS, Cholera saline, Hartmann solution.
30. Injections- Adrenaline, Dopamine, Dobutamine, Calcium gluconate, Distilled water.
31. Pulse oximeter.
32. Thermometer.

**At the Academic Institutional Laboratory, students should acquire the following competencies/activities--**

1. Indications of the above mentioned instruments.
2. How to wash hands, wear sterile gloves and gowns before entering Operation Theater.
3. How to use infusion and transfusion set.
4. How to measure blood pressure.
5. How to assemble a laryngoscope.
6. How to use AMBU bag.
7. How to use a pulse oximeter.
8. How to arrange instrument and kidney tray.
9. How to apply different masks.
10. How to use disposable syringe.
11. Orientation and acquire knowledge on General OT instruments.
12. Orientation and knowledge on Special OT (Gynae, Orthopedics, Eye, ENT etc.) instruments.
13. Orientation with the instruments used in different types of Anesthesia
14. Orientation with Post-operative medications with doses.

## Outline of Special Lab Attachment

### **Facilities in OT for clinical placement**

Hospital should have facilities of Emergency OT, General surgery OT, Orthopaedic OT, Head & Neck OT, Gynae & Obstetric OT, Modular OT with operation theatre wall and ceiling cladding system, laminar air flow system, scrub sink, X-Ray view screen, ceiling pendants, operation theatre light, peripheral light, dirty hatch or pass box, writing or list box, pressure relief damper, OT control panel, storage system, distribution board, operation theatre table, medical equipment, isolation panel, positive pressure ventilation, medical gas pipeline etc

### **Job Description of Diploma Operation Theatre Technologist**

#### **General Jobs**

#### **1. OT safety.**

##### **a) Safety of the OT staff**

Technologists and other lab Staff should be properly immunized.  
Take measures for proper immunization of Technologists and other lab Staff  
Wears proper and protective dress and remain alert about personal protection.

##### **b) Safety of the patient**

Maintain safety measures in every individual procedure. Keep arrangements of First Aid for emergency situations and complications.

##### **c) Safety of equipment and instruments**

Ensure cleanliness and maintains the OT equipment, apparatus and glassware according to manual and instructions by senior /subordinate staff.

##### **d) Arrangements and security of the OT.**

Ensures proper setting up of furniture, equipment and instruments  
Supervise and maintain the OT, an appropriate security measures to be ensured by OT staff.

##### **e) Play role in data collection, record and routine audit.**

#### **2. Commitment to the patient.**

- a) Should well behave properly with the patients and attendants.
- b) Explain procedures and consequences to the patients and their attendants.
- c) Do motivation and counseling where and when needed.
- d) Take consent of the patients and attendants where needed.
- e) Maintain privacy of the patient.

#### **3. Handling of poisonous and infected materials.**

- a) Proper labeling and storage of infected and poisonous materials.
- b) Proper handling of the body fluid and other discharges as per instructions.

#### **4. Continuous updating of professional knowledge about Operation Theatre procedures—practical and theoretical.**

5. Responsible for inter-departmental coordination and co-operation.
6. Arranges safe disposal of used and infected materials.

7. Responsible for maintenance of standard services in all aspects of Operation Theatre activities.
8. Preparing indents, collection of logistics, maintenance of ledger/register and reporting.
9. Supervision and training of junior colleagues.
10. Keep up-to-date about pharmacology of commonly used medicines in OT.

### **Specific Jobs**

1. Proper registration of patient in details
  - a. Name, age sex, religion
  - b. Occupation, address
  - c. present problem
  - d. past problem if any
2. Maintenance of all equipment, instruments, materials such as
  - a. Ventilator
  - b. Post-operative bed
  - c. Defibrillator
  - d. ABG machine
  - e. All drugs
3. Maintenance of stock ledger for equipment, instruments & materials and proper inventory time to time of the stock.
4. Maintain all departmental records such as
  - a. Register of patient
  - b. Treatment records
  - c. Expired patient records
5. Prepare indents
6. Provide health education and motivation of the patients. Give pre and post-operative care to the patient when needed.
  - a. Preoperative care**
    - I. Assure the patient
    - II. Check whether the patient has taken medicine before operation as advised by the anesthesiologist.
    - III. Ensure the patient's preparation as per the advice of the Anesthesiologist
  - b. Postoperative care**
    - I. If the patient is on mechanical ventilation the proper taking care of the airway and breathing of the patient.
    - II. Proper care of non-ventilated patient
7. Give bed side assistance to anesthesiologist during
  - a. Establishment of artificial ventilation by ventilator
  - b. Establishment of central venous line
8. Supervision & guidance of junior colleagues
9. Proper maintenance of OT room, sterilization of instrument, cotton gauze and other essentials.
10. Maintain patient appointment.
11. Acquire knowledge about manipulation of different types of anesthetic materials such as laryngoscope, tracheal tube, ventilators etc.
12. First aid emergency management and advise necessary medicine
13. Acquire knowledge about technical support to
  - a. Ventilator
  - b. Monitors and pulse oximeter

- c. Infusion pump
  - d. Defibrillator
  - e. Portable X- ray machine
  - f. Dialysis machine.
  - g. Laboratory equipment.
14. Acquire skills on
- a. Intravenous cannulation, maintain proper medication,
  - b. Endotracheal intubation
  - c. Central venous cannulation
  - d. Peritoneal dialysis
  - b. Regular checkup of vital parameters
  - c. Giving proper physiotherapy to the patient.

**Job at Teaching Institute** At the teaching institutes the Operation Theatre technologist personnel are positioned at three levels.

1. **Lecturers.**
  - a. They shall perform small group teaching in tutorial, demonstration and practical classes.
  - b. Facilitated practical demonstration and work of the students in the Operation Theatre room as facilitator of practical teaching group.
  - c. Senior lecturers can perform large group teaching as well.
2. **Instructors.**
  - a. They will perform tutorial and demonstration classes relevant to practical items.
  - b. Ensure and guide the student to prepare practical note books.
  - c. Demonstrate elaborately procedures and method of practical works in the Operation Theatre and follow students' performance in the practical classes.
  - d. Supervise practical classes as a team leader.
3. **Technologist.**
  - a. They shall perform practical in all practical classes.
  - b. Run practical demonstration and works for the students.
  - c. Perform small group demonstration relevant to practical.
  - d. Responsible for operation theatre room set up and organization including maintenance of registers, records and stock ledger under guidance of supervisor.
  - e. Responsible for the security and safety of the operation theatre room specially in respect to maintenance, infection, fire, electrical hazards and disposal of wastes.