

# NATIONAL CURRICULUM FRAMEWORK

For Undergraduate Health Professions Education In Nepal



Medical Education Commission  
Sanothimi, Bhaktapur

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*Approved by the meeting of Medical Education Commission  
dated 22 May, 2023*

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# Foreword

Well-defined competencies in the health professions curriculum are key to prepare qualified human resources for health services. In this regard, Medical Education Commission has developed **Undergraduate Level National Curriculum Framework for Health Professions Education** as a dynamic document that intends to guide the universities and academies.

The National Curriculum Framework for Health Professions Education has evolved after an extensive consultative workshops, meetings and interactions held with concerned authorities including head of institutions, academicians, curriculum experts, subject experts, faculties and other stakeholders.

This framework will guide the Universities and Academies to revise and update their curricula to achieve the competencies of graduates. It will be a milestone for establishment of competency based medical education to ensure qualitative healthcare in Nepal. It will enhance the quality of medical education and contribute to develop Nepal as a hub for medical education in coming days and also develop a ground for accreditation of our curricula and qualifications of medical graduates by international forums.

I take this opportunity to appreciate the untiring efforts of director and staff of Planning, co-ordination and academic upgrading directorate for their leading role to develop this important national document in the field of medical education. Similarly, Co-ordination committee members, subject experts, participants of consultative workshops and meetings as well deserve special thanks for their contribution in this endeavor.

**Prof. Dr. Shrikrishna Giri**

Vice Chairperson



# Contents

<b>1. Introduction .....</b>	<b>1</b>
1.1 Background.....	1
1.2 Current Context .....	1
1.3 Competency based Curriculum.....	2
1.4 Miller's Pyramid of Clinical Competence .....	2
1.5 Development Process .....	3
1.5.1 National Workshop of Stakeholders .....	4
1.5.2 Formation of Coordination Committee .....	4
1.5.3 Formation of Subject Committee.....	4
1.5.4 Literature Review .....	4
1.5.5 Workshop and Orientation Meeting.....	5
1.6 Objectives of National Curriculum Framework for Health Professions Education .....	5
1.7 Common Objectives of Undergraduate Health Professions Education .....	5
1.8 Conceptual Framework for Undergraduate Health Professions Education.....	6
1.9 Eligibility .....	6
1.9.1 MBBS/BDS/B.Sc. Nursing/BASLP/B. Perfusion Technology.....	6
1.9.2 BAMS/B.Sc. Lab Med/B.Sc. MIT/BPT/B. Pharmacy/B. Optometry ...	7
1.9.3 BPH .....	7
1.9.4 BNS/BMS .....	8
1.10 Credit Hours.....	8
1.11 Summary of Undergraduate Program.....	8
1.12 Assessment and Evaluation.....	9
1.13 Teaching Learning Methods .....	10
1.14. Barrier System .....	10
<b>2. Curriculum Framework of Health Profession Education Program.....</b>	<b>11</b>
2.1 Bachelor in Audiology and Speech-Language Pathology (BASLP).....	11
2.1.1 Introduction .....	11
2.1.2 Program Objectives.....	12
2.1.3 Areas of Learning .....	12
2.1.4 Core Competencies .....	13
2.1.5 Skill Competencies.....	14
2.2 Bachelor of Dental Surgery (BDS).....	16
2.2.1 Introduction .....	16
2.2.2 Programme Objectives .....	16

2.2.3	Areas of Learning .....	17
2.2.4	Core Competencies .....	18
2.2.5	Skill Competencies .....	23
2.3	Bachelor in Midwifery Science (BMS) .....	24
2.3.1	Introduction .....	24
2.3.2	Programme Objectives .....	25
2.3.3	Areas of Learning .....	26
2.3.4	Core/Skill Competencies .....	26
2.4	Bachelor of Optometry (B. Optometry).....	45
2.4.1	Introduction .....	45
2.4.2	Program Objectives.....	46
2.4.3	Areas of Learning .....	46
2.4.4	Core Competencies .....	47
2.4.5	Skill Competencies .....	47
2.5	Bachelor of Nursing Science (BNS).....	50
2.5.1	Introduction .....	50
2.5.2	Program Objectives.....	50
2.5.3	Areas of Learning .....	51
2.5.4	Core Competencies .....	52
2.5.5	Skill Competencies .....	61
2.6	Bachelor of Science in Nursing (B.Sc. Nursing).....	63
2.6.1	Introduction .....	63
2.6.2	Program Objectives.....	64
2.6.3	Areas of Learning .....	65
2.6.4	Core Competencies .....	66
2.6.5	Skill Competencies .....	76
2.7	Bachelor in Public Health (BPH) .....	79
2.7.1	Introduction .....	79
2.7.2	Program Objectives .....	80
2.7.3	Areas of Learning.....	80
2.7.4	Core/Skill Competencies .....	81
2.8	Bachelor of Physiotherapy (BPT) .....	84
2.8.1	Introduction .....	84
2.8.2	Programme Objectives .....	86
2.8.3	Areas of Learning .....	86
2.8.4	Core Competencies .....	87

2.9	Bachelor in Pharmacy (B. Pharmacy) .....	97
2.9.1	Introduction .....	97
2.9.2	Programme Objectives .....	99
2.9.3	Areas of Learning .....	99
2.9.4	Core Competencies .....	101
2.9.5	Skill Competencies .....	102
2.10	Bachelor of Science in Medical Imaging Technology (B.Sc. MIT).....	105
2.10.1	Introduction .....	105
2.10.2	Programme Objectives .....	106
2.10.3	Areas of Learning .....	107
2.10.4	Core Competencies .....	107
2.10.5	Skill Competencies .....	113
2.11	Bachelor of Ayurvedic Medicine and Surgery (BAMS) .....	114
2.11.1	Introduction .....	114
2.11.2	Programme Objectives .....	115
2.11.3	Areas of Learning .....	115
2.11.4	Core Competencies .....	116
2.11.5	Skill Competencies .....	117
2.12	Bachelor of Science in Laboratory Medicine (B.Sc. Lab. Med.) / Bachelor of Science in Medical Laboratory Technology (B.Sc. MLT).....	118
2.12.1	Introduction .....	118
2.12.2	Programme Objectives .....	120
2.12.3	Areas of Learning .....	121
2.12.4	Core Competencies .....	121
2.12.5	Core Skills.....	127
2.13	Bachelor of Medicine and Bachelor of Surgery (MBBS) .....	129
2.13.1	Introduction .....	129
2.13.2	Programme Objectives .....	130
2.13.3	Areas of Learning .....	131
2.13.4	Core Competencies .....	131
2.13.5	Skill Competencies .....	138
<b>3.</b>	<b>Contributors .....</b>	<b>140</b>
<b>4.</b>	<b>Participants of Consultative Meetings.....</b>	<b>141</b>
<b>5.</b>	<b>Bibliography .....</b>	<b>145</b>





# 1. Introduction

## 1.1 Background

National Curriculum Framework for Health Professions Education is a dynamic document that intends to be a guide for universities and academia that runs health Science Institutions. This document is neither prescriptive nor a rulebook, but could help to develop or revise core education curricula relevant to the present context. Curriculum framework does not represent core curriculum and it does not define the detail of the curriculum content. Standardization of health science curriculum framework is essential in this age of globalization. Nevertheless, diversity of curriculum must be fostered, to account for different educational, social, economic and cultural conditions and to support curriculum innovations.

As per provision of the National Medical Education Act, 2019 AD, in the context of the essence and spirit to improve medical education in Nepal, Medical Education Commission (MEC) has been established. It has prioritized the development of health science education in line with the national needs and regulates medical education in integrated and efficient way. Similarly, National Health Policy, 2020 AD and National Education Policy, 2020 AD has also highlighted need for the development and expansion of trained and competent health workforce with appropriate skill to ensure quality health care universally accessible and effective to the community. These policies also focus on production of specialized human resources, develop and implement integrated and competency-based curricula in health science education. Therefore, MEC has established strategies to balance diversity of differences in the standards and to identify competency domains and competencies that a graduate should be acquainted with to ensure quality health services they have to offer to the society.

## 1.2 Current Context

Nepal has now a long history of medical education when the Nepal Rajakiya Ayurved Vidyalyaya was started in 1933 AD at Kathmandu for the training of Ayurvedic health workers and the process of training different types of human resources for health started in Institute of Medicine, Maharajgunj, Kathmandu in 1972 AD. There was rapid rise in the number of medical colleges after 1990 AD producing more than 1500 doctors, nurses and many other health professionals annually.

Medical course in the initial days was basically community based, system wise and had integrated teaching as a SPICES (Student Centered, Problem based Learning, Integrated

Teaching, Community based, Electives, Systematic). Later on, problem-based learning was introduced in the medical education of Nepal. Recently, competency-based medical education has been developed and implemented globally to meet the demand of evolving health care system worldwide. Competency-based medical education is an outcome-based approach that ensures all learners achieve the desired patient centered outcomes during their training.

Medical Education Commission has given importance in the development of medical education in line with the national and international standards. Existence of different standards among the institutions has also created disparities and confusion. Therefore, lack of national level standard has always been realized and is the most important step to ensure quality education in the country. As per the mandate of National Education Policy, 2020 the development and implementation of integrated and competency-based education in the health sciences is an important step for the improvement of the quality.

### **1.3 Competency based Curriculum**

Competency is an observable ability of a health professional, integrating multiple components such as knowledge, skills, values and attitudes, while competent is possessing the required abilities in all domains in a certain context at a defined stage of medical education or practice. Therefore, competence entails more than the possession of knowledge, skills and attitudes; it requires to apply these [abilities] in the clinical environment to achieve optimal results. Traditional method of teaching is about knowledge acquisition and emphasizes on summative examinations with norm references. But, competency based medical education (CBME) demands knowledge application and emphasizes on formative examination with criterion reference. Therefore, in ideal situations, CBME has variable duration with fixed outcome. The CBME correlates on time spent in deliberate practice, habitual performance in daily practice, daily feedback and multiple in training examination. This system also shows a clear picture of a learning curve.

### **1.4 Miller's Pyramid of Clinical Competence**

In relation to competency based curriculum framework, the expected competencies can be categorized and assessed based on the Miller's pyramid, which distinguishes between knowledge that is needed at the basic level and the performance required at clinical practice. Miller's idea harmonizes the competency based education which focuses on learner's outcome. In this pyramidal hierarchy of learning which proceeds from the knowledge required for any action to be taken towards the independent performer of that particular action has a greater professional authenticity. This type of ranking clinical competence guides learners what to learn and when to learn.

Miller's pyramid described as having 4 levels: Knows, Knows How, Shows How and Does. In recent days the pyramid has incorporated the domains of Bloom's taxonomy as a 3D structure that incorporates attitude, cognition and psychomotor domains.

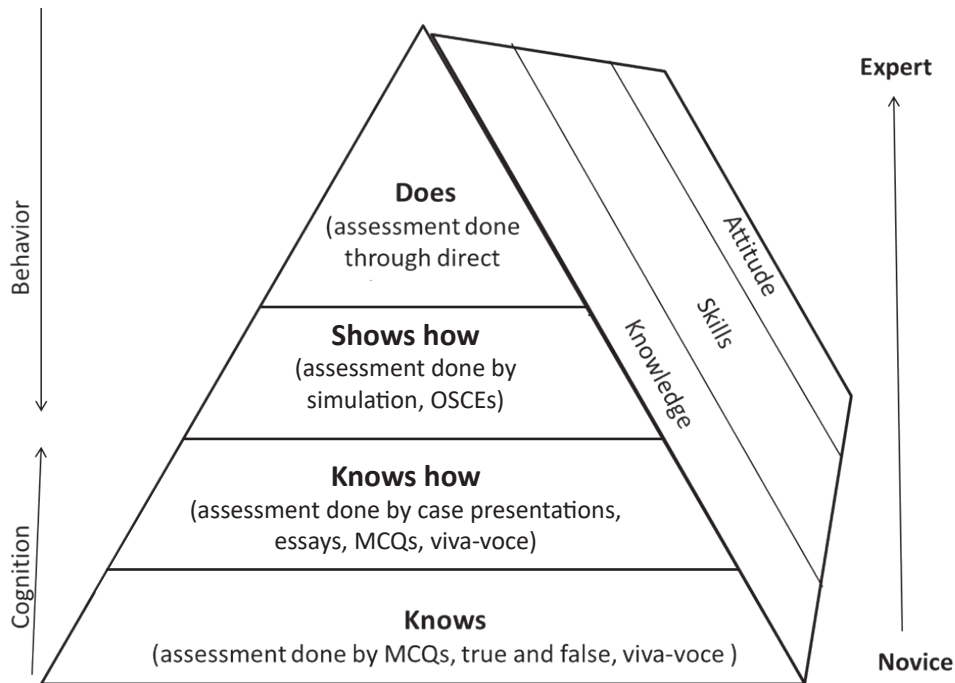
### Competency Domain

**K:** Knows

**KH:** Knows how

**SH:** Shows how

**D:** Does



**Figure 1 Miller's pyramid of clinical competence**

*Miller's pyramid of clinical competence. Modified from Miller, G.E. The assessment of clinical skills/competence/performance. Acad. Med. 1990;65(9): s63-s67. Adapted by Mehay R, Burns R, UK (2009)*

### **1.5 Development Process**

Global curricular context, analysis of the existing curricula, professional input of the experts and suggestions of stakeholders are the fundamental basis in designing this framework. The steps adopted were as follows:

- National workshop of stakeholders
- Formation of coordination committee

- Formation of subject committee
- Literature review
- Workshop and orientation meeting

### ***1.5.1 National Workshop of Stakeholders***

For the identification of issues and a way forward a national level workshop of stakeholders was conducted. The participants were dean, associate dean, academic head, examination controller and faculties from different universities and academia. Deliberations of the workshop were analysis of curriculum in terms of commonalities and variations. Course structures, areas of learning, teaching learning methodologies, evaluation process and barrier system were the main among the discussion points. Feedbacks and way forward from the stakeholders were the guiding principles for the development of national curriculum framework.

### ***1.5.2 Formation of Coordination Committee***

Under the coordination of the Director of planning, coordination and academic upgrading, a coordination committee of experts was formed to determine the structure of the framework and its development process. This committee conducted workshops, expert consultations and also provided advice and feedbacks throughout the process of curriculum framework development to the subject committee members.

### ***1.5.3 Formation of Subject Committee***

For the development of curriculum framework of health science courses run by different universities and academia, thirteen subject committees were formed. The subject committee worked in close collaboration and guidance from the coordination committee to study literatures, existing curriculum and educational materials. Subject committees worked for the formulation of objectives, learning outcomes and competencies. Subject committees received suggestions and feedback from many subject experts and educationist to shape the draft version of curriculum framework.

### ***1.5.4 Literature Review***

Several literatures related to the educational pedagogies, process of developing and implementing curriculum framework and existing curricula of different bachelor level courses of health sciences were studied and analyzed. The curriculum framework of countries like Australia, Canada, India, New Zealand, UK, US were studied. Google form was developed with the objective of collecting experts' suggestions especially about the competencies and learning outcomes. This process was instrumental as it was widely distributed among different subject experts throughout the universities and academia of

Nepal having programs of health sciences. The collected information was analyzed and incorporated into the framework and finally submitted the draft to the director's office of the medical education commission.

#### ***1.5.5 Workshop and Orientation Meeting***

Coordination committee held a series of meeting to discuss issues, clear confusions, structure and elements of curriculum framework. Committee also conducted seminar along with educationist and experts to finalize the structure of framework. Joint workshop with subject committee members was organized for cross learning and improvement of draft of curriculum framework.

### **1.6 Objectives of National Curriculum Framework for Health Professions Education**

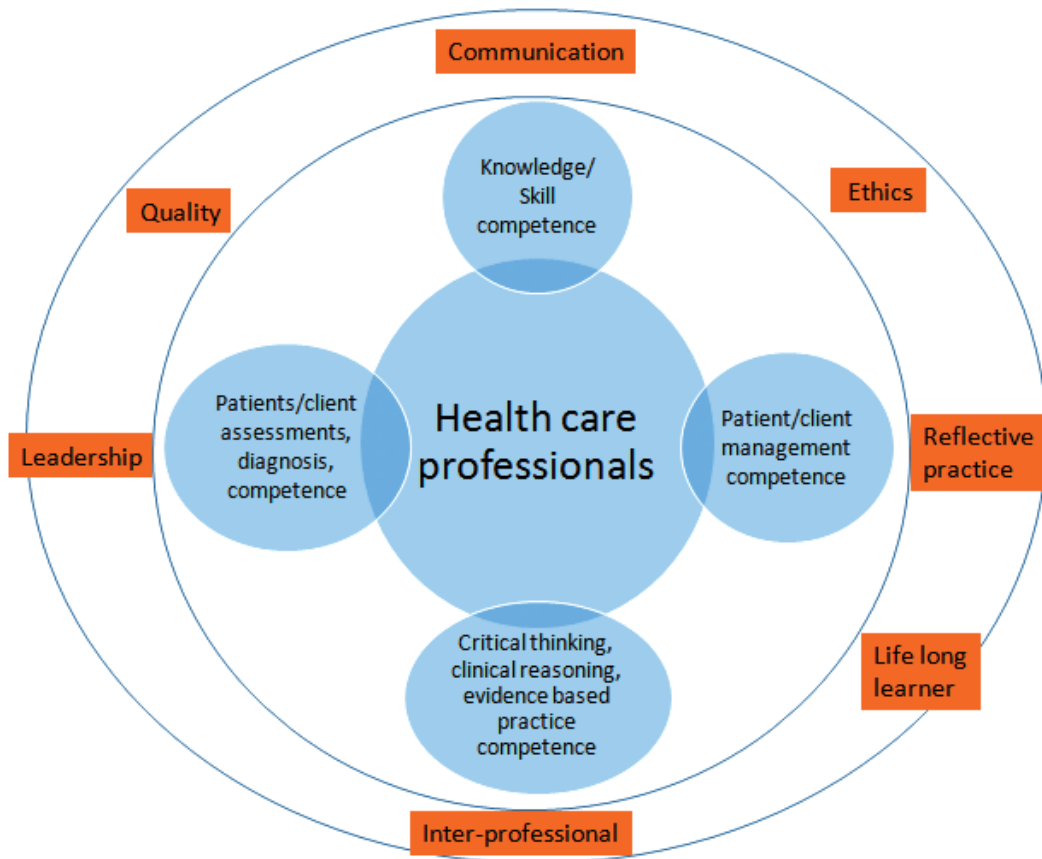
1. To encourage innovation in curriculum,
2. To facilitate curricular consistency, harmonization and equivalence,
3. To identify supportive, hidden, informal or implicit curriculum,
4. To ensure technology-friendly teaching learning methodology,
5. To foster professional development.

### **1.7 Common Objectives of Undergraduate Health Professions Education**

1. Recognize the importance of professionalism and ethical behavior.
2. Engage in professional practice with respect and dignity maintaining highest standards of ethical practice.
3. Demonstrate sensitiveness to the needs of the people, especially women, children elderly and the handicapped.
4. Work at appropriate to his/her position as a member of the health team at primary, secondary and tertiary levels.
5. Demonstrate skills and understanding of the necessity of cooperation across professional boundaries and build their professional practice on respect and a sense of equality.
6. Communicate and collaborate effectively with peers and medical colleagues/teams.
7. Produce competent, compassionate and community oriented health professionals.
8. Conduct an independent small scale research study in the respective field for evidence-based practice.
9. Develop skills in critical appraisal so that when faced with a clinical problem or new technique, he/she can apply the principles of evidence based practice to find and use appropriate information, evaluate its validity and applicability to his/her own work.
10. Participate in implementing the national health program.

11. Self-competent for national and international license registry and post-graduate entrance examination.

## 1.8 Conceptual Framework for Undergraduate Health Professions Education



*Figure 2 Conceptual framework for undergraduate Health Professions Education*

## 1.9 Eligibility

The eligibility for the common entrance examination set by Medical Education Commission for undergraduate programs are as follows:

### 1.9.1 MBBS/BDS/B.Sc. Nursing/BASLP/B. Perfusion Technology

- a. Passed 10+2 Science or equivalent (with Physics, Chemistry and Biology) with 50% aggregate in total marks or GPA 2.4 OR Secured the Percentage equivalent to above eligibility in regards to the certificate level programs (A-Level) with different grading system.

OR

- b. Applicants who have passed the Health Science Proficiency Certificate Level /Diploma (General Medicine, Medical Lab Technology, Ophthalmic Science, Dental Science, Pharmacy, Ayurveda, Radiography, Physiotherapy) containing Physics, Chemistry and Biology with Certificate of Equivalence to Grade 12 Science program from National Examination Board AND Secured at least 50% aggregate in total marks both in Diploma and the Examination for equivalence AND Registered in Nepal Health Professional Council or Nepal Pharmacy Council or Nepal Ayurveda Council as per related educational program.

**1.9.2 BAMS/B.Sc. Lab Med/B.Sc. MIT/BPT/B. Pharmacy/B. Optometry**

- a. Passed 10+2 Science or equivalent (with Physics, Chemistry and Biology) with 50% aggregate in total marks or GPA 2.4 OR Secured the percentage equivalent to above eligibility in regards to the certificate level programs (e.g., A-Level) with different grading system.

OR

- b. Applicants who have passed the Health Science Proficiency Certificate/Diploma (General Medicine, Medical Lab Technology, Ophthalmic Science, Dental Science, Pharmacy, Ayurveda, Radiography, Physiotherapy) with at least 50% aggregate in total marks AND Registered in Nepal Health Professional Council or Nepal Pharmacy Council or Nepal Ayurveda Council as per related educational program.

**1.9.3 BPH**

- a. Passed 10+2 Science or equivalent (with Physics, Chemistry and Biology) with 50% aggregate in total marks or GPA 2.4 OR Secured the Percentage equivalent to above eligibility in regards to the certificate level programs (A-Level) with different grading system.

OR

- b. Applicants who have passed the Health Science Proficiency Certificate/Diploma (General Medicine, Medical Lab Technology, Ophthalmic Science, Dental Science, Pharmacy, Ayurveda, Nursing, Radiography, Physiotherapy) with at least 50% aggregate in total marks AND Registered in Nepal Health Professional Council or Nepal Pharmacy Council, Nepal Nursing Council or Nepal Ayurveda Council as per related educational program.



### 1.9.4 BNS/BMS

Proficiency Certificate Level/ Diploma in Nursing securing at least 50% aggregate in total marks AND  
Registered in Nepal Nursing Council

### 1.10 Credit Hours

An academic year will consist of two semesters. Each semester will consist of a minimum of 16 weeks of active teaching learning plus four weeks of activities related to evaluation.

One credit hour is calculated as:

- 16 hours of active teaching, presentations, seminars or journal clubs
- 32 hours of learning in wet/skill laboratory
- 48 hours of learning in clinical setting (ward/ OPD/ OT)
- 48 hours of community posting.

### 1.11 Summary of Undergraduate Program

S.N.	Program	Academic session	Minimum course duration	Minimum Credit	Minimum Formative evaluation	Summative evaluation	Pass %
1	BAMS	Semester/ Annual	5.5 years	200	Theory-30% Practical-50%	Theory-70% Practical-50%	50%
2	BASLP	Semester/ Annual	4 years	150	Theory-30% Practical-50%	Theory-70% Practical-50%	50%
3	BDS	Semester/ Annual	5.5 years	200	Theory-30% Practical-50%	Theory-70% Practical-50%	50%
4	BMS	Semester/ Annual	4 years	150	Theory-30% Practical-50%	Theory-70% Practical-50%	50%
5	BNS	Semester/ Annual	4 years	150	Theory-30% Practical-50%	Theory-70% Practical-50%	50%
6	BPH	Semester/ Annual	4 years	150	Theory-30% Practical-50%	Theory-70% Practical-50%	50%
7	BPT	Semester/ Annual	5 years	150	Theory-30% Practical-50%	Theory-70% Practical-50%	50%
8	B. Optometry	Semester/ Annual	4 years	150	Theory-30% Practical-50%	Theory-70% Practical-50%	50%
9	B.Sc. MIT	Semester/ Annual	4 years	150	Theory-30% Practical-50%	Theory-70% Practical-50%	50%
10	B.Sc. Nursing	Semester/ Annual	4 years	150	Theory-30% Practical-50%	Theory-70% Practical-50%	50%

S.N.	Program	Academic session	Minimum course duration	Minimum Credit	Minimum Formative evaluation	Summative evaluation	Pass %
11	B.Sc. Lab Med/ B.Sc. MLT	Semester/ Annual	4 years	150	Theory-30% Practical-50%	Theory-70% Practical-50%	50%
12	MBBS	Semester/ Annual	5.5 years	200	Theory-30% Practical-50%	Theory-70% Practical-50%	50%
13	B. Perf.Tech.	Semester/ Annual	4 years	150	Theory-30% Practical-50%	Theory-70% Practical-50%	50%
14	B. Pharmacy	Semester/ Annual	4 years	150	Theory-30% Practical-50%	Theory-70% Practical-50%	50%

### 1.12 Assessment and Evaluation

- There will be formative and summative assessment
- Formative assessment will carry 30% of total marks in theory and 50% of total marks in practical paper
- Summative assessment will be 70% of total marks in theory and 50% of total marks in final practical paper (Candidate needs to secure at least 50% in clinical/practical/OSCE/OSPE/SCOT) mandatorily irrespective of formative assessment for further upgradation.
- Pass mark will be 50%(candidate has to mandatorily secure at least 50% in the practical university exam with the external evaluators markings exclusive of formative summation).

Where applicable, course evaluation based on letter grading system will have passing criteria of CGPA 2.7.

The following table illustrates comparative letter grading and GPA system.

Percentage	Grading	Grade Point Average (GPA)	Cumulative Grade point Average (CGPA)	Remarks
90 and above	A	4.0	4.0	Distinction
80-89.9	A-	3.7	3.7-3.99	Very good
70-79.9	B+	3.3	3.3-3.69	First division
60-69.9	B	3.0	3.0-3.29	Second division
50-59.9	B-	2.7	2.7-2.99	Pass in individual paper
<50	F	2.7	<2.7	Fail

### **1.13 Teaching Learning Methods**

1. Lectures (power point presentation, video demonstration)
2. Large group teaching, small group discussion, structured interactive sessions (SIS)
3. Clinical/Case-Based Learning (CBL) or Problem Based Learning (PBL), Team based learning (TBL), community-based learning
4. Practice in the models- OSPE, OSCE, Simulations, SCOT, Skill Labs
5. Seminars (Group discussions/presentations)
6. Blended learning
7. Self-directed learning (SDL)
8. Unconventional learning-role play, video demonstration, debate
9. E-Learning
10. Simulation based education
11. Skill laboratory practice
12. Observation field visits/trips
13. Reflective practice
14. Workshop, seminar
15. Project work
16. Journal Club/Health Seminar
17. Individual Health Research and Dissertation
18. Comprehensive Public Health Practicum

### **1.14. Barrier System**

Barrier system means formal withholding from upgradation or termination from the program. It will be according to the rules and regulations of the concerned university or academia.

## 2. Curriculum Framework of Health Profession Education Program

1. Introduction to the program: In this section a brief introduction to the undergraduate program, its inception, aims and overall philosophy is included for each program.
2. Program objective: This section outlines the general behavioural objectives of the concerned program.
3. Areas of Learning: Lists the courses/subjects/disciplines that are dealt throughout its academic period. The subjects/disciplines may vary in different institutions and in different academic years depending upon the availability of local resources and the need of the institutions. It may also include elective subjects.
4. Core competency: This section includes the expected outcome in the core (must know) area of the program.
5. Skill competency: This section lists the discrete clinical/manual/procedural skills expected to be attained by a student during or by the end of the course.

### 2.1 Bachelor in Audiology and Speech-Language Pathology (BASLP)

#### 2.1.1 Introduction

The Bachelor's degree in Audiology and Speech Language Pathology (BASLP) allows students to explore the mechanisms and processes of human communication and prepares students to pursue graduate education in the fields of speech-language pathology, audiology or speech and hearing science.

Audiologists are professionals with bachelor's degree in audiology and speech language pathology / master's degree in audiology and speech language pathology/master's degree in audiology, who are specialized in prevention, identification, assessment, diagnosis and management of persons with hearing and balance disorders. They are also qualified to provide habilitation and rehabilitation of persons with hearing impairment and they are qualified to fit and optimize hearing aids and cochlear Implants. Audiologists work in hospitals, rehabilitation centers, private practices, universities, schools, government agencies, industry, nursing homes and health departments.

Speech-language pathologists are professionals with bachelor's degree in audiology and speech language pathology/ master's degree in audiology and speech language pathology/ master's degree in speech language pathology. They are specialized in prevention, identification, assessment, diagnosis and management of persons with disorders of communication and swallowing (speech, language, voice and cognitive),

due to impairment in hearing, brain, respiratory system, phonatory system, articulatory system, nervous system, neuro-muscular and developmental delays, structural deformities, psychological disorders and psycho-social issues. Speech-language pathologists work in schools, hospitals, rehabilitation centers, nursing homes, research laboratories, universities, private practices and health departments.

BASLP course in Nepal started from 2009 AD in Institute of Medicine (IOM), Tribhuvan University. It is the first and only course in Nepal. In the beginning of the course, there was seats only for 4 students and since 2018 AD the number of seats has increased to 6.

### ***2.1.2 Program Objectives***

The objectives of the BASLP program are to equip the students with knowledge and skills to:

1. Function as Audiologists and Speech-Language pathologists in different work settings.
2. Understand concepts in speech, language, communication, hearing and balance disorder.
3. Prevent speech, language, swallowing and hearing disorders.
4. Screen, evaluate, diagnose and assess the severity of different disorders related to speech, language, swallowing and hearing.
5. Manage speech, language, swallowing and hearing disorders across life span.
6. Rehabilitate persons with speech, language, swallowing and hearing disorders.
7. Counsel the person and family with different communication (speech, Language, Voice and Cognitive disorders), hearing and balance related disorders.
8. Liaise with professionals in allied fields and other stake holders.
9. Implement public awareness and education program.
10. Undertake advocacy measures on behalf of and for persons with speech, language, hearing and balance related disorders.

### ***2.1.3 Areas of Learning***

1. Introduction to Speech-language Pathology
2. Introduction to Audiology
3. Psychology related to Speech and Hearing
4. Basic Medical Sciences related to Speech and Hearing
5. Speech Sound Disorders
6. Diagnostic Audiology
7. Speech Diagnostics and Therapeutics
8. Introduction to Linguistics
9. Voice and its Disorders

10. Electronics and Acoustics
11. Childhood Language Disorders
12. Fluency and its Disorders
13. Motor Speech Disorders in Children
14. Amplification devices
15. Research and Biostatistics
16. Dysphagia and Motor Speech Disorders in Adult
17. Pediatric Audiology
18. Structural Anomalies and Laryngectomy
19. Educational Audiology
20. Language Disorders in Adult
21. Environmental Audiology
22. Aural Rehabilitation
23. ASLP in Practice

#### ***2.1.4 Core Competencies***

1. Elicit general history of speech, language, hearing and balance related disorders.
2. Elicit family and medical history of speech, language, hearing and balance related disorders.
3. Identify the presenting speech-language and hearing related complaint.
4. Audiology learning competencies:
  - Assess the hearing and measure the hearing function.
  - Perform hearing aid programming, trials and NRT for CI.
  - Select appropriate ear mold for different population.
  - Perform tuning fork test, otoscopy and basic screening audiology tests for different age group.
  - Plan and implement Newborn hearing screening program and industrial hearing conservation program.
  - Perform and interpret different behavioral, special electrophysiological tests for different population.
  - Accurately identify different balance related (vestibular) disorders.
  - Prescribe and fit appropriate hearing aids and identify candidate for BAHA, cochlear implant (CI), middle ear implant, etc.
  - Plan and manage balance related (vestibular) disorders using different maneuver and exercise.
  - Counsel regarding causes of hearing loss, factors related to the outcome and prognosis of hearing loss and balance related disorders.

5. Speech Language Pathology Learning Competencies:
  - Assess speech and language related disorders.
  - Administer various speech and language assessment tools.
  - Rehabilitate various childhood and adult communication disorders using different language stimulation, fluency shaping, voice and articulation therapy techniques.
  - Conduct various dysphagia related evaluation and rehabilitate them.
  - Perform Auditory Verbal Therapy.
  - Refer patient for medical consultation and speech language therapy.
  - Advice and counsel patient and care givers about speech and language disorders and its prognosis.
6. Plan and refer patient to various interdisciplinary team.
7. Undertake independent scientific studies and critically analyse scientific literature.
8. Develop and produce material required for hearing, speech and language assessment and rehabilitation.
9. Plan and implement community-based speech and hearing care services.
10. Maintain clinical reports of patient.
11. Project roles and responsibilities of profession and practice the given guidelines.

### 2.1.5 Skill Competencies

S.N.	Competency	Miller's Competency Level
1	Elicit general history of speech, language, hearing and balance related disorders	D
2	Identify the presenting speech-language and hearing related complaint	D
3	Elicit family and medical speech-language and hearing history	D
4	Assess speech and language related disorders	D
5	Administer various speech and language assessment tools	D
6	Interpretation of Test administered	D
7	Diagnosis of Speech and Language Disorders	SH
8	Assess the hearing and measure the hearing function	SH
9	Perform hearing aid programming and trials	SH
10	Perform NRT for CI	SH
11	Select appropriate ear mold for different population	SH
12	Perform tuning fork test, otoscopy and basic screening audiology tests for different age group	SH

S.N.	Competency	Miller's Competency Level
13	Plan and implement Newborn hearing screening program and industrial hearing conservation program	SH
14	Perform and interpret different behavioural, special test, electrophysiological tests for different population	D
15	Accurately identify different vestibular and balance related disorders	KH
16	Rehabilitate various childhood and adult communication disorders using different language stimulation, fluency shaping and voice and articulation therapy techniques	D
17	Conduct various Dysphagia related Evaluation and rehabilitate them	SH
18	Perform Auditory Verbal Therapy	D
19	Refer patient for medical consultation and speech language therapy	D
20	Advice and counsel patient and care givers about speech and language disorders and its prognosis	D
21	Prescribe and fit appropriate hearing aids and identify candidate for BAHA, cochlear implant (CI), middle ear implant, etc	SH
22	Plan and manage vestibular disorders using different maneuver and exercise	KH
23	Counsel regarding causes of hearing loss, factors related to the outcome and prognosis of hearing loss	SH
24	Describe the roles and responsibilities of profession and follow the given guidelines	K
25	Undertake independent scientific studies and critically analyse scientific literature	D
26	Develop and produce material required for hearing, speech and language assessment and rehabilitation	SH
27	Maintain clinical reports of patient	D



## **2.2 Bachelor of Dental Surgery (BDS)**

### **2.2.1 Introduction**

One fourth of the population in Nepal are suffering from oral health problems due to low socioeconomic condition. The dental health professionals to the population ratio right now is 1:9000 urban areas and 1:56000 rural areas. The goal of the National Oral Health Policy is to prevent and control of the determinants of oral disease and promote oral health amongst the Nepalese people. The Bachelor of Dental Surgery (BDS) curriculum is to produce health manpower needed and deemed appropriate for the twenty-first century.

The main goal of the curriculum is to produce a manpower to improve the health status of the people of Nepal by providing holistic health care through training of compassionate, caring, communicative and socially accountable health workforce acting as agents of change and through advancement in research and innovation in service as well as education to ensure healthy individuals and families by collaborating with all stakeholders. Understand that their current knowledge of dentistry is incomplete and evolving, that their teaching is research led, the dental degree is a mile-stone in dental education and that crucially, education must continue throughout their professional careers.

The goals of the curriculum, which has been designed embracing modern educational science technology - as applied to Dental Education, provides for acquisition of:

- A core knowledge that a dental surgeon must possess.
- Clinical skills to diagnose and manage oral disease.
- Desirable characteristics and attitudes ingrained in the profession.
- Competency to determine and resolve oral health problems of the community.
- Proficiency to function in diverse health care settings.
- Interest in continuing oral health education.
- Evidence based practice.

### **2.2.2 Programme Objectives**

At the end of the course, the graduate should be able to:

1. Describe the development, structure and function of the body in health and disease.
2. Determine the socio-economic, psycho-social, cultural and environmental factors influencing oral health and diseases.
3. Develop an understanding of the scope, scientific basis, capabilities and limitations of the major subject areas within dentistry as they are currently understood.
4. Diagnose and manage common oral and dental health problems in the community appropriate to his/her position as a member of the health team at primary, secondary and tertiary levels.

5. Apply appropriate technology for clinical diagnosis and develop habits of rational use of drugs.
6. Practice preventive, interceptive, promotive, curative and rehabilitative dentistry applying the concepts of oral health care.
7. Realize his/her limitations and refer patients to the next level of care as and when appropriate and to the advantage of the patients.
8. Identify and initiate appropriate treatment for life-threatening and dental emergencies and refer when necessary.
9. Understand the concept of the Dental Team and are able to work as key members of it, demonstrating leadership skills.
10. Participate in implementing the national oral health program.
11. Update his knowledge by participating in the continuing professional education in dentistry (CPED) program.
12. Plan, implement and evaluate oral health programs.
13. Communicate with individual family, peer, community and members of the health team.
14. Treat patients with respect and dignity maintaining highest standards of ethical practice.
15. Identify and manage medico-legal problems related to dentistry.
16. Demonstrate sensitiveness to the needs of the people, especially women, children elderly and the handicapped.
17. Promote oral health education and interceptive programs.
18. To carry out studies involving the oral health problems.
19. Develop skills in critical appraisal so that when faced with a clinical problem or new technique, they can apply the principles of evidence-based practice to find and use appropriate information, evaluate its validity and applicability to their own work.
20. Understand that their current knowledge of dentistry is incomplete and evolving, that their teaching is research led, the dental degree is a mile-stone in dental education and that crucially, education must continue throughout their professional careers.

### ***2.2.3 Areas of Learning***

1. IBMS (Integrated basic medical sciences): Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology
2. Dental Materials
3. Dental Anatomy and Dental Histology (Oral Biology)
4. Preclinical Prosthodontics
5. Preclinical Conservative and Endodontic
6. Oral Pathology

7. General Medicine
8. General Surgery
9. Anesthesiology
10. Psychiatry
11. Forensic Medicine and Odontology
12. Oral Medicine and Radiology
13. Orthodontics
14. Pedodontics and Preventive Dentistry
15. Community Dentistry
16. Oral and Maxillofacial Surgery
17. Periodontology
18. Prosthodontics
19. Conservative and Endodontics

#### **2.2.4 Core Competencies**

<b>S.N.</b>	<b>Competency</b>	<b>Miller's Competency Level</b>
1	Identify the various histological slides of the lesions of oral and par-oral structures	KH
2	Identify the various tooth anomalies in the tooth and dental casts	KH
3	Identify various developmental disorders of the paroral structures	KH
4	Diagnose various oral manifestations of the systematic diseases	KH
5	Identify various salivary gland disorders	KH
6	Identify the viral, bacterial and fungal infections affecting oral cavity	K
7	Conduct age estimation	KH
8	Diagnose common oral pathological lesions microscopically	K
9	Obtain detail history of a child and an adult	SH
10	Examine patient ( child/adult) in sequence	SH
11	Take various intraoral X-rays	SH
12	Develop the intraoral X-rays	SH
13	Interpret the extra oral X-rays	SH
14	Identify the various paraoral anomalies	K
15	Perform the sample collection for exfoliative cytology	SH

S.N.	Competency	Miller's Competency Level
16	Perform aspiration of the lesion	SH
17	Diagnose the various oral lesions	KH
18	Identify the various dental hard tissue disorders	KH
19	Prescribe a drugs for prophylactic and therapeutic requirements	KH
20	Identify the errors in the radiograph and ways to correct them	KH
21	Identify different radiographic films	KH
22	Apply the knowledge about radiation health hazards, radiations safety and protection	K
23	Apply the knowledge of jurisprudence, ethics for the maintenance of confidentiality of patient and dental records with respect to law	K
24	Identify the primary and permanent dentition	KH
25	Correlate the dental age chronologically	KH
26	Identify pernicious oral habits that may exacerbate malocclusion	KH
27	Manage the dental needs of children with special health care	KH
28	Prevent and intercept developing malocclusion	KH
29	Manage to repair and restore the lost tooth structure to maintain harmony between both hard and soft tissues of the oral cavity	KH
30	Apply the principles of preventive dentistry from birth to adolescence	KH
31	Manage oral health programs for population health	KH
32	Demonstrate ethical decision-making in the practice of dental public health	KH
33	Evaluate systems of care that impact oral health	KH
34	Design surveillance systems to measure oral health status and its determinants	SH
35	Communicate on oral and public health issues	SH
36	Lead collaborations on oral and public health issues	KH
37	Advocate for public health policy, legislation and regulations to protect and promote oral health and overall health	SH

S.N.	Competency	Miller's Competency Level
38	Critically appraise evidence to address oral health issues for individuals and population	SH
39	Conduct research to address oral and public health problems	KH
40	Integrate the social determinants of health into dental public health practice	KH
41	Identify malocclusion	KH
42	Fabricate removable appliances	SH
43	Identify various appliances used for treatment of malocclusion	KH
44	Perform cephalometric tracing	SH
45	Identify and design various clasps on dental casts	SH
46	Perform common local anesthesia nerve blocks in mandible and maxilla	SH
47	Diagnose the facial bone fractures	KH
48	Perform extraction of tooth	SH
49	Perform suturing of tissue	SH
50	Perform different methods of maxilla-mandibular fixation on dental casts	SH
51	Perform incision and drainage of abscess	KH/SH
52	Identify various restorative materials	KH
53	Identify various instruments used for the cavity preparation and endodontic preparation	KH
54	Perform cavity preparation	SH
55	Perform restoration of tooth	SH
56	Perform preparation of tooth for placement of crown	SH
57	Perform biomechanical preparation	SH
58	Identify various materials required for root canal treatment	KH
59	Perform emergency access opening for the root canal treatment	SH
60	Diagnose various pulpal and periapical lesion	KH
61	Identify the causes and consequences of tooth loss on residual ridge	KH
62	Use different methods of prevention of ridge resorption	KH

S.N.	Competency	Miller's Competency Level
63	Make impression for complete denture, Removable partial denture and fixed partial denture	SH
64	Apply the knowledge of normal TMJ anatomy, movement of the mandible and Maxillomandibular relationship in denture fabrication	KH
65	Fabricate complete denture, perform relining and rebasing technique and repair the denture	SH
66	Demonstrate the procedure of processing, finishing, initial placement and adjustment of partial dentures	KH
67	Plan treatment for the replacement of missing teeth. Demonstrate Investing and casting of metal prosthesis	KH
68	Identify different materials used in fabrication of maxillofacial prosthesis	KH
69	Manage various periodontal diseases and conditions	KH
70	Identify dental plaque, dental calculus and other predisposing factors for periodontal diseases	KH
71	Evaluate the age changes seen in the periodontium, effects of aging on periodontium and response to the treatment	KH
72	Identify various mechanical and chemical plaque control agents and armamentarium	KH
73	Perform about the sonic and ultrasonic supragingival and subgingival scaling	SH
74	Identify the various dental implant systems and their components and manage peri-implant diseases	KH
75	Perform the periodontal maintenance procedures	SH
76	Application of fluoride	D

S.N.	Competency domain: Communication, Leadership and Professionalism	Miller's Competency Level
1	Assess, manage and prevent the medical and dental emergencies	KH
2	Assess the outcomes of comprehensive dental care. Manage the medically compromised dental patient.	KH
3	Manage pain and anxiety in the dental patient.	SH

S.N.	Competency domain: Communication, Leadership and Professionalism	Miller's Competency Level
4	Manage the orofacial pain and temporomandibular disorders	SH
5	Apply universal infection control guidelines for all clinical procedures	SH
6	Apply appropriate communication skills to interact with patients and their families and supporting staff	SH
7	Exchange information, professional knowledge and experience with professional colleagues	KH
8	Learn to work constructively in a team/ group and cooperate with other colleagues and professionals	KH
9	Understand and respect the roles and expertise of health and social care professionals in the context of working and learning as a multi-professional team	KH
10	Apply psychosocial and behavioral principles in patient centered health care	KH
11	Apply appropriate ethical and legal standards in providing patient centered care in accordance with health care rules and regulations of Nepal	KH
12	Recognize the importance of maintaining professional growth and life-long learning	K
13	Apply and demonstrate practice management skills and quality assurance principles	KH
14	Maintain and utilize dental records. Recognize and practice new concepts and modalities of oral health care delivery	KH
15	Asses the scientific evidence published in professional journals and Integrate scientific research with for optimum evidence-based care	KH
16	Understand the opportunities for improving oral health beyond his/her practice through participation and outreach and community based clinical and health promotion educational activities	K
17	Provide appropriate means of prevention, intervention and educational strategies for all patients at risk of disease	KH

### 2.2.5 Skill Competencies

S.N.	Core Skills/Procedures	Miller's Competency Level	
		At the End of Final Year	At the End of Internship
1	Cavity preparation (class I to class VI)	SH	D
2	Rubber dam application	KH	SH/D
3	Universal precaution	SH	SH
4	Local anesthesia nerve block	SH	D
5	Root canal treatment	KH	SH/D
6	Apicotomy	KH	KH
7	Removable partial denture fabrication	SH	D
8	Complete denture fabrication	SH	D
9	Crown preparation for fixed partial denture	SH	D
10	Denture repair	KH	D
11	Supra gingival and subgingival scaling	SH	D
12	Gingivectomy and root planning	KH	SH
13	Child behavior management	SH	SH
14	Lateral cephalograph tracing and diagnosis of malocclusion	SH	D
15	Fabrication of removable orthodontic appliances	SH	D
16	Fixed appliances treatment	KH	KH
17	Incision and Drainage	KH	SH
18	Aspiration of abscess	KH	SH
19	Suturing skills	KH	SH/D
20	Fabrication of obturator	KH	KH
21	Management of dry socket	KH	SH/D
22	Management of MPDS	KH	KH
23	Management of internal derangement of TMJ	KH	KH
24	Management of odontogenic infections	KH	KH
25	Simple foreign body removal – maxillary sinus	KH	SH
26	Extraction of tooth	SH	D
27	Extraction of impacted tooth	KH	KH
28	Preprosthetic surgery	KH	KH
29	Cardiopulmonary resuscitation (CPR)	KH	SH



S.N.	Core Skills/Procedures	Miller's Competency Level	
		At the End of Final Year	At the End of Internship
30	Surgical treatment of cysts and tumors of oral cavity	KH	KH
31	Management of oral cancer	KH	KH
32	Facial bone fracture treatment	KH	KH
33	Splinting and immobilization	KH	SH
34	Application of flourides and its uses	KH	SH/D

## 2.3 Bachelor in Midwifery Science (BMS)

### 2.3.1 Introduction

According to the International Confederation of Midwives (ICM), "A midwife is a person who has successfully completed a midwifery education programme that is duly recognized in the country where it is located and that is based on the ICM Essential Competencies for Basic Midwifery Practice and the framework of the ICM Global Standards for Midwifery Education; who has acquired the requisite qualifications to be registered and/or legally licensed to practice midwifery and use the title 'midwife'; and who demonstrates competency in the practice of midwifery."

The midwife is recognized as a responsible and accountable professional who works in partnership with women to give the necessary support, care and advice during pregnancy, labour and the postpartum period to conduct births on the midwife's own responsibility and to provide care for the newborn and the infant.

In response to the global recognition of the significance of midwifery care in reducing maternal and neonatal mortality and morbidity, Nepal has introduced post-registration studies for nurses to upgrade to become a professional midwife. The need of professional midwife human resources in the country is addressed in the Skilled Birth Attendant Policy, 2006, Nepal New Health Policy, 2019, the Safe Motherhood Road Map, 2019/20 and the Nursing and Midwifery Strategic Plan, 2020.

The maternal and newborn mortality status in Nepal is 151/100000 live births and newborn mortality /1000 live birth (National Population and housing census 2021) which is highest among the Asian countries. The country is the signatory to global goal (SDGs) in reduction of these mortalities at 70 maternal deaths and 12 newborn deaths by 2030. The midwifery workforce for the country has been estimated of 10,590 by 2030 (NSSD, Nursing and Midwifery Strategic Action Plan (2019-2026) for which midwifery education

has been started in 2016 initially from Kathmandu University (KU) followed by National Academy of Medical Sciences (NAMS), Karnali Academy of Health Sciences (KAHS), BP Koirala Institute of Health Sciences (BPKIHS) and recently in Patan Academy of Health Sciences (PAHS).

The first cohort of newly graduated midwives from the 3 Years (NAMS) and 4 Years (KU) Bachelor of professional midwifery program are now in the workforce (**51 graduated midwives till 2022**), are the milestone in human resource development in Nepal for sexual reproductive maternal, newborn and adolescent health (SRMNAH).

This curriculum framework represents the collaborative effort of National Medical Education Commission to improve medical education in line with the national needs that regulates in integrated and efficient ways to maintain quality education. The guiding principles of this curriculum framework are informed by the National Education Policy, ICM's philosophy, position statements for programme delivery and Global Strategic Direction for Nurses and Midwives 2020 by WHO.

The framework includes the objectives, midwifery core competencies, learning areas (subjects) that reflects the International Confederation of Midwives (ICM) Essential Competencies for Midwifery Practice.

### **2.3.2 Programme Objectives**

At the end of the course, the graduates will be able to:

1. Provide human-rights-based, quality, socio-culturally sensitive and dignified care to women, newborns and their family in health facilities.
2. Communicate and collaborate effectively with peers and medical colleagues/teams.
3. Assist in the physiological processes during pre-pregnancy, pregnancy and labour, ensuring a clean environment and a positive childbirth experience.
4. Engage actively with women, using women-centred respectful care that fosters therapeutic relationships.
5. Provide continuity of care to the childbearing women during pregnancy, birth and postpartum period.
6. Respond creatively with resilience to challenging scenarios and environments such as GBV survivors, disasters, pandemics and other situations to vulnerable groups.
7. Perform all signal functions of emergency maternal and newborn care (basic emergency obstetric and newborn care (BEmONC) and comprehensive emergency obstetric and newborn care (CEmONC) (as part of a team).
8. Conduct an independent small scale research study in the field of midwifery for evidence- based practice.

9. Apply leadership and management skill in midwifery practice and education.
10. Conduct class room and clinical teaching to junior students and staffs.
11. Provide holistic care to the women with deviated mental health conditions.

### **2.3.3 Areas of Learning**

1. Basic Science in Midwifery (Anatomy, Physiology, Pharmacology, Microbiology, Pathology, Biochemistry)
2. Foundation of Midwifery
3. Midwifery in Healthy Pregnancy
4. Midwifery in Normal Labour and Birth
5. Midwifery for Normal Post-Partum and Newborn
6. Nutrition for Life Cycle
7. Midwifery in Public Health
8. Midwifery in Complex Pregnancy
9. Midwifery in Complex Labor and Birth
10. Midwifery in Complex Post-Partum and Newborn
11. Education Science
12. Midwifery in SRMNAH and Morbidities
13. Maternal Mental Health
14. Leadership and Management
15. Research and Biostatistics

### **2.3.4 Core/Skill Competencies**

The ICM's Essential Competencies for Midwifery Practice are designed to ensure that a minimum standard of quality is maintained for global accreditation for competent midwifery practice. These competencies are intended to guide midwifery educators, training institutions and on-site clinical facilities in ensuring that midwifery students obtain the knowledge, skills and professional behaviours. These competencies are divided into FOUR inter-related categories<sup>1</sup>, with a total of 318 minimum essential competencies of ICM. These skills are categorized as:

#### **1. Category 1: General Competencies (1a to 1m):**

Competencies in this category are about the midwife's autonomy and accountabilities as a health professional, the relationships with women and other care providers and care activities that apply to all aspects of midwifery practice. General competencies apply across each of categories 2, 3 and 4.

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<sup>1</sup>ICM core competencies for midwifery practice, 2019

**2. Category 2: Pre-pregnancy and antenatal care (2a to 2i)**

Competencies in this category are about health assessment of the woman and fetus, promotion of health and well-being, detection of complications during pregnancy and care of women with an unexpected pregnancy.

**3. Category 3: Care during labor and birth (3a to 3c)**

Competencies in this category are about assessment and care of women during labour that facilitates physiological processes and a safe birth, the immediate care of the newborn infant, detection of complications in mother or infant, stabilisation of emergencies and referral as needed.

**4. Category 4: On-going care of the mother and her newborn (4a to 4f)**

Competencies in this category address the continuing health assessment of mother and infant, health education, support for breast feeding, detection of complications, stabilization and referral in emergencies and provision of family planning services.

Category	Competencies: K/KH/SH/D
1. General Competencies	<p><b>1a Assume responsibility for own decisions and actions as an Autonomous practitioner</b></p> <p><b>Knowledge: K/KH</b></p> <p>1a.i Principles of accountability and transparency</p> <p>1a.ii Principles and concepts of autonomy</p> <p>1a.iii Principles of self-assessment and reflective practice</p> <p>1a.iv Personal beliefs and their influence on practice</p> <p>1a.v Knowledge of evidence-based practices</p> <p><b>Skills and Behaviours: SH</b></p> <p>1a.vi Demonstrate behaviour that upholds the public trust in the profession</p> <p>1a.vii Participate in self-evaluation, peer review and other quality improvement activities</p> <p>1a.viii Balance the responsibility of the midwife to provide best care with the autonomy of the woman to make her own decisions</p> <p>1a.ix Explain the midwife’s role in providing care that is based on relevant law, ethics and evidence</p> <hr/> <p><b>1b Assume responsibility for self-care and self-development as a midwife</b></p> <p><b>Knowledge: K/KH</b></p> <p>1b.i Strategies for managing personal safety particularly within the facility or community setting</p>

1. General Competencies	<p><b>Skills and Behaviours: SH</b></p> <p>1b.ii Display skills in management of self in relation to time management, uncertainty, change and coping with stress</p> <p>1b.iii Assume responsibility for personal safety in various practice settings</p> <p>1b.iv Maintain up-to-date skills and knowledge concerning protocols, guidelines and safe practice</p> <p>1b.v Remain current in practice by participating in continuing professional education (for example, participating in learning opportunities that apply evidence to practice to improve care such as mortality reviews or policy reviews.)</p> <p>1b.vi Identify and address limitations in personal skill, knowledge or experience</p> <p>1b.vii Promote the profession of midwifery, including participation in professional organizations at the local and national level</p>
	<p><b>1c Appropriately delegate aspects of care and provide supervision</b></p> <p><b>Knowledge: K/KH</b></p> <p>1c.i Policies and regulation related to delegation</p> <p>1c.ii Supportive strategies to supervise others</p> <p>1c.iii Role of midwives as preceptors, mentors, supervisors and role models</p> <p><b>Skills and Behaviours: SH</b></p> <p>1c.iv Provide supervision to ensure that practice is aligned with evidence-based clinical practice guidelines</p> <p>1c.v Support the profession's growth through participation in midwifery education in the roles of clinical preceptor, mentor and role model</p>
	<p><b>1d Use research to inform practice</b></p> <p><b>Knowledge: K/KH</b></p> <p>1d.i Principles of research and evidence-based practice</p> <p>1d.ii Epidemiologic concepts relevant to maternal and infant health</p> <p>1d.iii Global recommendations for practice and their evidence base (e.g., World Health Organisation guidelines)</p> <p><b>Skills and Behaviours: SH</b></p> <p>1d.iv Discuss research findings with women and colleagues</p> <p>1d.v Support research in midwifery by participating in the conduct of research</p>

1. General Competencies	<p><b>1e Uphold fundamental human rights of individuals when providing midwifery care</b></p> <p><b>Knowledge: K/KH</b></p> <p>1e.i      Laws and/or codes that protect human rights</p> <p>1e.ii     Sexual, reproductive health rights of women and girls</p> <p>1e.iii    Development of gender identity and sexual orientation</p> <p>1e.iv     Principles of ethics and Human Rights within midwifery practice</p> <p><b>Skills and Behaviours: SH</b></p> <p>1e.v      Provide information to women about their sexual and reproductive health rights</p> <p>1e.vi     Inform women about the scope of midwifery practice and women's rights and responsibilities</p> <p>1e.vii    Provide information and support to individuals in complex situations where there are competing ethical principles and rights</p> <p>1e.viii   Practice in accordance with philosophy and code of ethics of the ICM and national standards for health professionals</p> <p>1e.ix     Provide gender sensitive care</p>
	<p><b>1f Adhere to jurisdictional laws, regulatory requirements and codes of conduct for midwifery practice</b></p> <p><b>Knowledge: K/KH</b></p> <p>1f.i      The laws and regulations of the jurisdiction regarding midwifery</p> <p>1f.ii     National/state/local community standards of midwifery practice</p> <p>1f.iii    Ethical principles</p> <p>1f.iv     ICM and other midwifery philosophies, values, codes of ethics</p> <p><b>Skills and Behaviours: SH</b></p> <p>1f.v      Practise according to legal requirements and ethical principles</p> <p>1f.vi     Meet requirements for maintenance of midwifery registration</p> <p>1f.vii    Protect confidentiality of oral information and written records about care of women and infants</p> <p>1f.viii   Maintain records of care in the manner required by the health authority</p> <p>1f.ix     Comply with all local reporting regulations for birth and death registration</p> <p>1f.x      Recognize violations of laws, regulations and ethical codes and take appropriate action</p> <p>1f.xi     Report and document incidents and adverse outcomes as required while providing care</p>

1. General Competencies	<p><b>1g Facilitate women to make individual choices about care</b></p> <p><b>Knowledge: K/KH</b></p> <p>1g.i Cultural norms and practices surrounding sexuality, sexual practices, marriage, the childbearing continuum and parenting</p> <p>1g.ii Principles of empowerment</p> <p>1g.iii Methods of conveying health information to individuals, groups, communities</p> <p><b>Skills and Behaviours: SH</b></p> <p>1g.iv Advocate for and support women to be the central decision makers in their care</p> <p>1g.v Assist women to identify their needs, knowledge, skills, feelings and preferences throughout the course of care</p> <p>1g.vi Provide information and anticipatory guidance about sexual and reproductive health to assist women's decision making</p> <p>1g.vii Collaborate with women in developing a comprehensive plan of care that respects her preferences and decisions</p>
	<p><b>1h Demonstrate effective interpersonal communication with women and families, health care teams and community groups</b></p> <p><b>Knowledge: K/KH</b></p> <p>1h.i Role and responsibilities of midwives and other maternal – infant health providers</p> <p>1h.ii Principles of effective communication</p> <p>1h.iii Principles of effectively working in health care teams</p> <p>1h.iv Cultural practices and beliefs related to childbearing and reproductive health</p> <p>1h.v Principles of communication in crisis situations, e.g., grief and loss, emergencies</p> <p><b>Skills and Behaviours: SH</b></p> <p>1h.vi Listen to others in an unbiased and empathetic manner</p> <p>1h.vii Respect one others' point of view</p> <p>1h.viii Promote the expression of diverse opinions and perspectives</p> <p>1h.ix Use the preferred language of the woman or an interpreter to maximise communication</p> <p>1h.x Establish ethical and culturally-appropriate boundaries between professional and non-professional relationships</p> <p>1h.xi Demonstrate cultural sensitivity to women, families and communities</p>

1. General Competencies	1h.xii	Demonstrate sensitivity and empathy for bereaved women and family members
	1h.xiii	Facilitate teamwork and inter-professional care with other care providers (including students) and community groups/ agencies
	1h.xiv	Establish and maintain collaborative relationships with individuals, agencies, institutions that are part of referral networks
	1h.xv	Convey information accurately and clearly and respond to the needs of individuals
	<b>1i Facilitate normal birth processes in institutional and community settings, including women's homes</b>	
<b>Knowledge: K/KH</b>		
1i.i	Normal biologic, psychologic, social and cultural aspects of reproduction and early life	
1i.ii	Practices that facilitate and those that interfere with normal processes	
1i.iii	Policies and protocols about care of women in institutional and community settings	
1i.iv	Availability of resources in various settings	
1i.v	Community views about and utilization of health care facilities and place(s) of birth	
<b>Skills and Behaviours: SH</b>		
1i.vi	Promote policies and a work culture that values normal birth processes	
1i.vii	Utilize human and clinical care resources to provide personalized care for women and their infants	
1i.viii	Provide continuity of care by midwives known to woman	
<b>1j Assess the health status, screen for health risks and promote general health and well-being of women and infants</b>		
<b>Knowledge: K/KH</b>		
1j.i	Health needs of women related to reproduction	
1j.ii	Health conditions that pose risks during reproduction	
1j.iii	Health needs of infants and common risks	
<b>Skills and Behaviours: SH/D</b>		
1j.iv	Conduct a comprehensive assessment of sexual and reproductive health needs	
1j.v	Assess risk factors and at-risk behaviour	



1. General Competencies	1j.vi	Order, perform and interpret laboratory and/ or imaging screening tests
	1j.vii	Exhibit critical thinking and clinical reasoning informed by evidence when promoting health and well being
	1j.viii	Provide health information and advice tailored to individual circumstances of women and their families
	1j.ix	Collaborate with women to develop and implement a plan of care
	<b>1k Prevent and treat common health problems related to reproduction and early life</b>	
	<b>Knowledge: K/KH</b>	
	1k.i	Common health problems related to sexuality and reproduction
	1k.ii	Common health problems and deviations from normal of newborn infants
	1k.iii	Treatment of common health problems
	1k.iv	Strategies to prevent and control the acquisition and transmission of environmental and communicable diseases
<b>Skills and Behaviours: SH/D</b>		
1k.v	Maintain/promote safe and hygienic conditions for women and infants	
1k.vi	Use universal precautions consistently	
1k.vii	Provide options to women for coping with and treating common health problems	
1k.viii	Use technology and interventions appropriately to promote health and prevent secondary complications	
1k.ix	Recognize when consultation or referral is indicated for managing identified health problems, including consultation with other midwives	
1k.x	Include woman in decision-making about referral to other providers and services	
<b>1l Recognise abnormalities and complications and institute appropriate treatment and referral</b>		
<b>Knowledge: K/KH</b>		
1l.i	Complications/pathologic conditions related to health status	
1l.ii	Emergency interventions/life-saving therapies	
1l.iii	Limits of midwifery scope of practice and own experience	
1l.iv	Available referral systems to access medical and other personnel to manage complications	

1. General Competencies	1l.v	Community/facility plans and protocols for accessing resources in timely manner
	<b>Skills and Behaviours: SH/D</b>	
	1l.vi	Maintain up-to-date knowledge, life-saving skills and equipment for responding to emergency situations
	1l.vii	Recognize situations requiring expertise beyond midwifery care
	1l.viii	Maintain communication with women about nature of problem, actions taken and referral if indicated
	1l.ix	Determine the need for immediate intervention and respond appropriately
	1l.x	Implement timely and appropriate intervention, inter-professional consultation and/or timely referral taking account of local circumstances <sup>19</sup>
	1l.xi	Provide accurate oral and written information to other care providers when referral is made.
	1l.xii	Collaborate with decision-making if possible and appropriate
	<b>1m Care for women who experience physical and sexual violence and abuse</b>	
	<b>Knowledge: K/KH</b>	
	1m.i	Socio-cultural, behavioural and economic conditions that often accompany violence and abuse
	1m.ii	Resources in community to assist women and children
	1m.iii	Risks of disclosure
	<b>Skills and Behaviours: SH/D</b>	
	1m.iv	Protect privacy and confidentiality
	1m.v	Provide information to all women about sources of help regardless of whether there is disclosure about violence
	1m.vi	Inquire routinely about safety at home, at work
	1m.vii	Recognize potential signs of abuse from physical appearance, emotional affect, related risk behaviours such as substance abuse
1m.viii	Provide special support for adolescents and victims of gender-based violence including rape	
1m.ix	Refer to community resources, assist in locating safe setting as needed	

2. Pre-pregnancy and antenatal care	<p><b>2a Provide pre-pregnancy care</b></p> <p><b>Knowledge: K/KH</b></p> <p>2a.i Anatomy and physiology of female and male related to reproduction and sexual development</p> <p>2a.ii Socio-cultural aspects of human sexuality</p> <p>2a.iii Evidence based screening for cancer of reproductive organs and other health problems such as diabetes, hypertension, thyroid conditions and chronic infections that impact pregnancy</p> <p><b>Skills and Behaviours: SH/D</b></p> <p>2a.iv Identify and assist in reducing barriers related to accessing and using sexual and reproductive health services</p> <p>2a.v Assess nutritional status, current immunization status, health behaviours such as use of substances, existing medical conditions and exposure to known teratogens</p> <p>2a.vi Carry out screening procedures for sexually transmitted and other infections, HIV, cervical cancer</p> <p>2a.vii Provide counseling about nutritional supplements such as iron and folic acid, dietary intake, exercise, updating immunizations as needed, modifying risk behaviours and prevention of sexually transmitted infections, family planning and methods of contraception.</p>
	<p><b>2b Determine health status of woman</b></p> <p><b>Knowledge: K/KH</b></p> <p>2b.i Physiology of menstrual and ovulatory cycle</p> <p>2b.ii Components of a comprehensive health history including psycho-social responses to pregnancy and safety at home</p> <p>2b.iii Components of complete physical exam</p> <p>2b.iv Health conditions including infections and genetic conditions detected by screening blood and biologic samples</p> <p><b>Skills and Behaviours: SH/D</b></p> <p>2b.v Confirm pregnancy and estimate gestational age from history, physical exam, laboratory test and/or ultrasound</p> <p>2b.vi Obtain comprehensive health history</p> <p>2b.vii Perform a complete physical examination</p> <p>2b.viii Obtain biologic samples for laboratory tests (e.g., venipuncture, finger puncture, urine samples and vaginal swabs)</p> <p>2b.ix Provide information about conditions that may be detected by screening</p>

2. Pre-pregnancy and antenatal care	2b.x Assess status of immunizations and update as indicated
	2b.xi Discuss findings and potential implications with woman and mutually determine plan of care
	<p><b>2c Assess fetal well-being</b></p> <p><b>Knowledge: K/KH</b></p> <p>2c.i Placental physiology, embryology, fetal growth and development and indicators of fetal well-being</p> <p>2c.ii Evidence-based guidelines for use of ultrasound</p> <p><b>Skills and Behaviours: SH/D</b></p> <p>2c.iii Assess fetal size, amniotic fluid volume, fetal position, activity and heart rate from examination of maternal abdomen</p> <p>2c.iv Determine whether there are indications for additional assessment/examination and refer accordingly</p> <p>2c.v Assess fetal movements and ask woman about fetal activity</p>
<p><b>2d Monitor the progression of pregnancy</b></p> <p><b>Knowledge: K/KH</b></p> <p>2d.i Usual physiological and physical changes with advancing pregnancy</p> <p>2d.ii Nutritional requirements of pregnancy</p> <p>2d.iii Common psychological responses to pregnancy and symptoms of psychological distress</p> <p>2d.iv Evidence informed antenatal care policies and guidelines, including frequency of antenatal visits</p> <p><b>Skills and Behaviours: SH/D</b></p> <p>2d.v Conduct assessments throughout pregnancy of woman's physical and psychological well-being, family relationships and health education needs</p> <p>2d.vi Provide information regarding normal pregnancy to woman, her partner, family members or other support persons</p> <p>2d.vii Suggest measures to cope with common discomforts of pregnancy</p> <p>2d.viii Provide information (including written and/ or pictorial) about danger signs, (e.g., vaginal bleeding, signs of preterm labour, prelabour, rupture of membranes) emergency preparedness and when and where to seek help</p> <p>2d.ix Review findings and revise plan of care with woman as pregnancy progresses</p>	

2. Pre-pregnancy and antenatal care	<p><b>2e Promote and support health behaviours that improve wellbeing</b></p> <p><b>Knowledge: K/KH</b></p> <p>2e.i Impact of adverse social, environmental and economic conditions on maternal -fetal health</p> <p>2e.ii Effects of inadequate nutrition and heavy physical work</p> <p>2e.iii Effects of tobacco use and exposure to second-hand smoke, use of alcohol and addictive drugs</p> <p>2e.iv Effects of prescribed medications on fetus</p> <p>2e.v Community resources for income support, food access and programs to minimize risks of substance abuse</p> <p>2e.vi Strategies to prevent or reduce risks of mother-to-child disease transmission including infant feeding options for HIV infection</p> <p>2e.vii Effects of gender-based violence, emotional abuse and physical neglect</p> <p><b>Skills and Behaviours: SH/D</b></p> <p>2e.viii Provide emotional support to women to encourage change in health behaviour</p> <p>2e.ix Provide information to woman and family about impact on mother and fetus of risk conditions.</p> <p>2e.x Counsel women about and offer referral to appropriate persons or agencies for assistance and treatment</p> <p>2e.xi Respect women’s decisions about participating in treatments and programs</p> <p>2e.xii Make recommendations and identify resources for smoking reduction/cessation in pregnancy</p> <hr/> <p><b>2f Provide anticipatory guidance related to pregnancy, birth, breastfeeding, parenthood and change in the family</b></p> <p><b>Knowledge: K/KH</b></p> <p>2f.i Needs of Individuals and families for different information at different times in their respective life cycles</p> <p>2f.ii Methods of providing information to individuals and groups</p> <p>2f.iii Methods of eliciting maternal feelings and expectations for self, infant and family</p> <p><b>Skills and Behaviours: SH/D</b></p> <p>2f.iv Participate in and refer women and support persons to--childbirth education programs</p> <p>2f.v Convey information accurately and clearly and respond to needs of individuals</p>
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2. Pre-pregnancy and antenatal care	2f.vi	Prepare the woman, partner and family to recognize labour onset, when to seek care and progress of labour
	2f.vii	Provide information about postpartum needs including contraception, care of newborn infants and the importance of exclusive breast feeding for infant health
	2f.viii	Identify needs or problems requiring further expertise or referral such as excessive fear and dysfunctional relationships
	<b>2g Detect, stabilise, manage and refer women with complicated pregnancies</b> <b>Knowledge: K/KH</b> 2g.i Complications of early pregnancy such as threatened or actual miscarriage and ectopic pregnancy 2g.ii Fetal compromise, growth restriction, malposition, preterm labour 2g.iii Signs and symptoms of maternal pathologic conditions such as pre-eclampsia, gestational diabetes and other systemic illnesses 2g.iv Signs of acute emergencies such as hemorrhage, seizures and sepsis <b>Skills and Behaviours: SH/D</b> 2g.v Stabilise in emergencies and refer for treatment as necessary 2g.vi Collaborate in care of complications 2g.vii Implement critical care activities to support vital body functions (e.g., intravenous (IV) fluids, magnesium sulphate, antihemorrhagics) 2g.viii Mobilize blood donors if necessary 2g.ix Transfer to higher level facility if needed	
<b>2h Assist the woman and her family to plan for an appropriate place of birth</b> <b>Knowledge: K/KH</b> 2h.i Evidence about birth outcomes in different birthplace settings 2h.ii Availability of options in specific location; limitations of climate, geography, means of transport and resources available in facilities 2h.iii Local policies and guidelines <b>Skills and Behaviours: SH/D</b> 2h.iv Discuss options, preferences and contingency plans with woman and support persons and respect their decision 2h.v Provide information about preparing birth site if in community, e.g., travel and admission to facility 2h.vi Promote the availability of a full range of birth settings		

2. Pre-pregnancy and antenatal care	<p><b>2i Provide care to women with unintended or mistimed pregnancy</b></p> <p><b>Knowledge: K/KH</b></p> <p>2i.i Complexity of decision-making about unintended or mistimed pregnancies</p> <p>2i.ii Emergency contraception</p> <p>2i.iii Legal options for induced abortion; eligibility and availability of medical and surgical abortion services</p> <p>2i.iv Medications used to induce abortion; properties, effects and side effects</p> <p>2i.v Risks of unsafe abortion</p> <p>2i.vi Family planning methods appropriate for the post-abortion period.</p> <p>2i.vii Care and support (physical and psychological) needed during and after abortion</p> <p><b>Skills and Behaviours: SH/D</b></p> <p>2i.viii Confirm pregnancy and determine gestational age; refer for ultrasound if unknown gestation and/or symptoms of ectopic pregnancy</p> <p>2i.ix Counsel woman about options to maintain or end the pregnancy and respect the ultimate decision.</p> <p>2i.x Provide supportive antenatal care if pregnancy continued; refer to agencies and social services for support and assistance when needed</p> <p>2i.xi Identify from obstetric, medical and social history, contraindications to medication or aspiration methods</p> <p>2i.xii Provide information about legal regulations, eligibility and access to abortion services</p> <p>2i.xiii Provide information about abortion procedures, potential complications, management of pain and when to seek help</p> <p>2i.xiv Refer to provider of abortion services upon request</p> <p>2i.xv Provide post-abortion care</p> <ul style="list-style-type: none"> <li>• Confirm expulsion of products of conception from history, ultrasound or levels of HCG</li> <li>• Review options for contraception and initiate immediate use of method</li> <li>• Explore psychological response to abortion</li> </ul>
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2. Pre-pregnancy and antenatal care	<p><b>Additional Skills</b></p> <p>2i.xvi Prescribe, dispense, furnish or administer drugs according to scope of practice and protocol (however authorized to do so in the jurisdiction of practice) in dosages appropriate to induce medication abortion</p> <p>2i.xvii Perform manual vacuum aspiration of the uterus up to 12 completed weeks of pregnancy</p> <p>2i.xviii An additional skill is performed by midwives under either of two circumstances:</p> <p>a) Midwives who elect to engage in a broader scope of practice and/or</p> <p>b) Midwives who have to implement certain skills to make a difference in maternal or neonatal outcome</p>
3. Care during labour and birth	<p><b>3a Promote physiologic labour and birth</b></p> <p><b>Knowledge: K/KH</b></p> <p>3a.i Anatomy of maternal pelvis and fetus; mechanisms of labour for different fetal presentations</p> <p>3a.ii Physiologic onset and progression of labour</p> <p>3a.iii Evidence informed intrapartum care policies and guidelines, including avoidance of routine interventions in normal labour and birth</p> <p>3a.iv Cultural and social beliefs and traditions about birth</p> <p>3a.v Signs and behaviours of labour progress</p> <p>3a.vi Methods of assessing fetus during labour</p> <p><b>Skills and Behaviours: SH/D</b></p> <p>3a.vii Provide care for a woman in the birth setting of her choice, following policies and protocols</p> <p>3a.viii Obtain relevant obstetric and medical history</p> <p>3a.ix Perform and interpret focused physical examination of the woman and fetus</p> <p>3a.x Order and interpret laboratory tests if needed</p> <p>3a.xi Assess woman's physical and behavioural responses to labour</p> <p>3a.xii Provide information, support and encouragement to woman and support persons throughout labour and birth</p> <p>3a.xiii Provide respectful one-to-one care</p> <p>3a.xiv Encourage freedom of movement and upright positions</p> <p>3a.xv Provide nourishment and fluids</p> <p>3a.xvi Offer and support woman to use strategies for coping with labour pain, e.g., controlled breathing, water immersion, relaxation, massage and pharmacologic modalities when needed</p>



3. Care during labour and birth	<p>3a.xvii Assess regularly parameters of maternal-fetal status and e.g., vital signs, contractions, cervical changes and fetal descent</p> <p>3a.xviii Use labour progress graphic display to record findings and assist in detecting complications, e.g., labour delay, fetal compromise, maternal exhaustion, hypertension, infection</p> <p>3a.xix Augment uterine contractility judiciously using non-pharmacological or pharmacological agents to prevent non-progressive labour</p> <p>3a.xx Prevent unnecessary routine interventions, e.g., amniotomy, electronic fetal monitoring, directed</p>
	<p><b>3b Manage a safe spontaneous vaginal birth; prevent, detect and stabilise complications</b></p> <p><b>Knowledge: K/KH</b></p> <p>3b.i Manage a safe spontaneous vaginal birth.</p> <p>3b.ii Evidence about conduct of third stage, including use of uterotonics</p> <p>3b.iii Potential complications and their immediate treatment e.g., shoulder dystocia and excessive bleeding, fetal compromise, eclampsia, retained placenta</p> <p>3b.iv Management of emergencies as covered in emergency skills training programmes such as BEmONC, HMS</p> <p>3b.v Signs of placental separation; appearance of normal placenta, membranes and umbilical cord</p> <p>3b.vi Types of perineal and vaginal trauma requiring repair and suturing techniques</p> <p><b>Skills and Behaviours: SH/D</b></p> <p>3b.vii Support the woman to give birth in her position of choice</p> <p>3b.viii Ensure clean environment, presence of clean necessary supplies and source of warmth</p> <p>3b.ix Coach woman about pushing to control expulsion of presenting part, avoid routine episiotomy</p> <p>3b.x Undertake appropriate manoeuvres and use maternal position to facilitate vertex, face or breech birth</p> <p>3b.xi Expedite birth in presence of fetal distress</p> <p>3b.xii Delay cord clamping</p> <p>3b.xiii Manage nuchal cord</p> <p>3b.xiv Assess immediate condition of newborn</p> <p>3b.xv Provide skin to skin contact and warm environment</p> <p>3b.xvi Deliver placenta and membranes and inspect for completeness</p>

3. Care during labour and birth	<p>3b.xvii Assess uterine tone, maintain firm contraction and estimate and record maternal blood loss; manage excessive blood loss including administration of uterotonics</p> <p>3b.xviii Inspect vaginal and perineal areas for trauma and repair as needed, following policies and protocols</p> <p>3b.xix Provide first line measures to treat or stabilise identified conditions</p> <p>3b.xx Refer for continuing treatment of any complications as needed</p>
	<p><b>3c Provide care of the newborn immediately after birth</b></p> <p><b>Knowledge: K/KH</b></p> <p>3c.i Normal transition to extra-uterine environment</p> <p>3c.ii Scoring systems to assess newborn status</p> <p>3c.iii Signs indicating need for immediate actions to assist transition</p> <p>3c.iv Interventions to establish breathing and circulation as covered in training programs such as HBS</p> <p>3c.v Appearance and behaviour of healthy newborn infant</p> <p>3c.vi Method of assessing gestational age of newborn infant</p> <p>3c.vii Needs of small for gestational age and low birth weight infants</p> <p><b>Skills and Behaviours: SH/D</b></p> <p>3c.viii Use standardized method to assess newborn condition in the first minutes of life (Apgar or other); refer if needed</p> <p>3c.ix Institute actions to establish and support breathing and oxygenation, refer for continuing treatment as needed</p> <p>3c.x Provide a safe warm environment for initiating breastfeeding and attachment (bonding) in the first hour of life</p> <p>3c.xi Conduct a complete physical examination of newborn in presence of mother/family; explain findings and expected changes e.g., colour of extremities, moulding of head. Refer for abnormal findings.</p> <p>3c.xii Institute newborn prophylaxis e.g., ophthalmic infection and hemorrhagic disease, according to policies and guidelines</p> <p>3c.xiii Promote care by mother, frequent feeding and close observation</p> <p>3c.xiv Involve partner/support persons in providing newborn care</p>
4. Ongoing care of women and newborns	<p><b>4a Provide postnatal care for the healthy woman</b></p> <p><b>Knowledge: K/KH</b></p> <p>4a.i Physiological changes following birth, uterine involution, onset of lactation, healing of perineal-vaginal tissues</p> <p>4a.ii Common discomforts of the postnatal period and comfort measures</p>

4. Ongoing care of women and newborns	<p>4a.iii Need for rest, support and nutrition to support lactation</p> <p>4a.iv Psychological responses to mothering role, addition of infant to family</p> <p><b>Skills and Behaviours: SH/D</b></p> <p>4a.v Review history of pregnancy, labour and birth</p> <p>4a.vi Conduct a focused physical exam to assess breast changes and involution.</p> <p>4a.vii Monitor blood loss and other body functions</p> <p>4a.viii Assess mood and feelings about motherhood and demands of infant care</p> <p>4a.ix Provide pain control strategies if needed for uterine contractions and perineal trauma</p> <p>4a.x Provide information about self-care that enables mother to meet needs of newborn, e.g., adequate food, nutritional supplements, usual activities, rest periods and household help</p> <p>4a.xi Provide information about safe sex, family planning methods appropriate for the immediate postnatal period and pregnancy spacing</p>
	<p><b>4b Provide care to healthy newborn infant</b></p> <p><b>Knowledge: K/KH</b></p> <p>4b.i Appearance and behaviour of infant in early life; cardio-respiratory changes related to adapting to extra-uterine life</p> <p>4b.ii Growth and development in initial weeks and months of life</p> <p>4b.iii Protocols for screening for metabolic conditions, infectious conditions and congenital abnormalities</p> <p>4b.iv Protocols/guidelines for immunizations in infancy</p> <p>4b.v Evidence-based information about infant circumcision; family values, beliefs and cultural norms</p> <p><b>Skills and Behaviours: SH/D</b></p> <p>4b.vi Examine infant at frequent intervals to monitor growth and developmental behaviour</p> <p>4b.vii Distinguish normal variation in newborn appearance and behaviour from those indicating pathologic conditions</p> <p>4b.viii Administer immunizations, carry out screening tests as indicated</p> <p>4b.ix Provide information to parents about a safe environment for infant, frequent feeding, care of umbilical cord, voiding and stooling and close physical contact</p>

4. Ongoing care of women and newborns	<p><b>4c Promote and support breastfeeding</b></p> <p><b>Knowledge: K/KH</b></p> <p>4c.i Physiology of lactation</p> <p>4c.ii Nutritional needs of newborn infants, including low birth weight infants</p> <p>4c.iii Social, psychological and cultural aspects of breastfeeding</p> <p>4c.iv Evidence about benefits of breastfeeding</p> <p>4c.v Indications and contraindications to use of drugs and substances during lactation</p> <p>4c.vi Awareness of lactation aids</p> <p><b>Skills and Behaviours: SH/D</b></p> <p>4c.vii Promote early and exclusive breastfeeding while respecting a woman's choice regarding newborn feeding</p> <p>4c.viii Provide information about infant needs, frequency and duration of feedings and weight gain</p> <p>4c.ix Provide support and information about breastfeeding for a minimum of six months, including combining with work, maintaining milk supply and storing breast milk</p> <p>4c.x Identify and manage breastfeeding problems (e.g., mastitis, low milk supply, engorgement, improper latch)</p> <p>4c.xi Provide information to women breastfeeding multiple newborns</p> <p>4c.xii Refer women to breastfeeding support as indicated</p> <p>4c.xiii Advocate for breastfeeding in family and community</p>
	<p><b>4d Detect, treat and stabilise postnatal complications in woman and refer as necessary</b></p> <p><b>Knowledge: K/KH</b></p> <p>4d.i Signs and symptoms of</p> <ul style="list-style-type: none"> <li>• conditions in the postnatal period that may respond to early intervention (e.g., sub-involution, anaemia, urinary retention and localized infection)</li> <li>• complications that need referral to more specialized provider or facility (e.g., hematoma, thrombophlebitis, sepsis, obstetric fistula and incontinence)</li> <li>• life threatening complications requiring immediate response and specialized care (hemorrhage, amniotic fluid embolus, seizure and stroke)</li> </ul> <p>4d.ii Signs and symptoms of postnatal depression, anxiety and psychosis</p> <p>4d.iii Mourning process following perinatal death</p>

4. Ongoing care of women and newborns	<p><b>Skills and Behaviours: SH/D</b></p> <p>4d.iv Provide information to woman and family about potential complications and when to seek help.</p> <p>4d.v Assess woman during postnatal period to detect signs and symptoms of complications</p> <p>4d.vi Distinguish postnatal depression from transient anxiety about caring for baby, assess availability of help and support at home and provide emotional support</p> <p>4d.vii Provide counseling and follow-up care for women and family members who experience stillbirth, neonatal death, serious infant illness and congenital conditions</p> <p>4d.viii Provide first line measures to treat or stabilize identified conditions</p> <p>4d.ix Arrange referral and/or transfer as needed</p>
	<p><b>4e Detect, stabilise and manage health problems in newborn infant and refer if necessary</b></p> <p><b>Knowledge: K/KH</b></p> <p>4e.i Congenital anomalies and genetic conditions</p> <p>4e.ii Needs of pre-term and low birth weight infants</p> <p>4e.iii Symptoms and treatment of withdrawal from maternal drug use</p> <p>4e.iv Prevention of mother-to-child transmission of infections such as HIV, hepatitis B and C</p> <p>4e.v Signs and symptoms of common health problems and complications; their immediate and ongoing treatment</p> <p><b>Skills and Behaviours: SH/D</b></p> <p>4e.vi Assess and recognise abnormal findings</p> <p>4e.vii Implement protocols for care of low birth weight infants, e.g., ensure warmth, nutrition, monitor condition, “Kangaroo” care as appropriate</p> <p>4e.viii Provide information to mother and support persons about infant condition</p> <p>4e.ix Provide support in situations where infant separated from mother for special care</p> <p>4e.x Recognise indications of the need for specialized care in the newborn</p> <p>4e.xi Stabilise and transfer the at-risk newborn to emergency care facility</p>

## **2.4 Bachelor of Optometry (B. Optometry)**

### **2.4.1 Introduction**

Optometry as a profession has the primary eye health responsibility for eliminating visual impairment to provide excellent vision care to all the people of the country. Optometrists take care of the majority of the patients with eye related disease, visual impairment and its rehabilitation and refer them to other medical professionals for any systemic evaluation that needs special medical care or surgical attention. Optometrists are primarily an Optometric (eye) physician who have ultimate responsibility to reduce the burden of ocular disorder and support to reach universal eye health coverage by meeting the different sustainable development goals related to eye care. They work mutually with ophthalmologists and ophthalmic assistants with a good understanding to provide qualitative services to the patients.

World Council of Optometry (WCO) defines “Optometrists are the primary healthcare practitioner of the eye and visual system who provide comprehensive eye and vision care, which includes refraction and dispensing, detection/diagnosis and management of ocular problems and the rehabilitation of conditions of the visual system”

Currently, ophthalmologists, optometrists and ophthalmic assistants are the major eye health service providers in Nepal. The population to eye care practitioner ratio in Nepal is well below the standard set by “WHO” for prevention of blindness. Optometrists are the ophthalmic human resources who carry out eye examinations, provide primary, secondary and tertiary eye care services especially related to vision. Majority of the problems related to the eye are vision related and hence, optometrists can reduce the workload of ophthalmologists and also cut down the cost of eye care services making it sustainable and affordable in developing countries like Nepal. Production of optometrists, therefore, helps not only to overcome the constraints of eye health manpower, but also economic constraints within the country. Hence this course is designed to produce competent and well trained skilled optometrists.

Optometry as a primary health care profession covers a wide range of responsibilities. From corporate to individual practice and from community to hospital locations. Optometrists are the front line eye care practitioners when it comes to caring for the vision problems and referring only those patients to ophthalmologists and medical practitioners who actually need specialized care. Optometrists work mutually with other members of the eye care team with a good understanding to provide quality eye care services to the patients. The major goal of the B. Optometry program is to produce a competent, compassionate and community oriented optometrist who is capable of providing exclusive vision care, identify ocular and related systemic illness to be referred to medical practitioners, treat common eye disorders.

Optometrists and ophthalmologist are two different levels of health professionals who provide eye care services. Optometrists are not an alternative to ophthalmologists. In general, optometrists carry out the bulk of eye examinations and solve eye problems especially related to vision. It is considered more economical and appropriate to provide vision care services through primary health care unit rather than secondary or tertiary care units.

World Report of Vision published by World Health Organization in 2019 have reported that eye conditions are projected to increase due to increasing ageing population, life styles and different non communicable diseases. Production of optometrists, therefore, helps not only to overcome the constraints of eye health manpower, but also economic constraints within the country.

#### ***2.4.2 Program Objectives***

1. To provide competent, compassionate and community-oriented optometrist who is capable of providing exclusive vision care, identify ocular and related systemic illness to be referred to medical practitioners, treat common eye disorders.
2. To provide knowledge and develop practical skills in primary eye health care in the field of visual, optical and behavioral science for high school graduates.
3. Develop the research and scientific writing skills through the introduction of research methods, term paper and thesis.
4. Ensure the skillful, practical and leading human resources through the community diagnosis and comprehensive field practices.
5. Develop the extracurricular competencies through training and seminar.

#### ***2.4.3 Areas of Learning***

1. Integrated Basic Medical Sciences: Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology
2. Geometrical, Physical and Visual Optics
3. Ocular System (Anatomy and Physiology)
4. Foundation to Optometric and Visual Science
5. Public Health and Community Medicine
6. Applied Psychology
7. Ocular Disease-Diagnostics and Therapeutics
8. Clinical Optometry
9. Basics of Ophthalmic Optics
10. Binocular Vision
11. Low Vision and Contact lenses

12. Advanced Ophthalmic Dispensing
13. Binocular Vision and Vision Therapy
14. Low Vision and Rehabilitation
15. Contact Lenses and Ocular Prosthesis
16. Pediatric and Geriatric Optometry
17. Research Methodology
18. Applied Community Optometry
19. Occupational Optometry
20. Eye Health Management
21. Entrepreneurship and Ethics
22. Optometry Project
23. Integrated Clinical Optometric Practice

#### **2.4.4 Core Competencies**

1. Non-surgical care: This domain includes able to conduct the comprehensive patient evaluations, synthesizing information to determine the diagnosis and formulating management plan.
2. Surgical care: This domain includes performing pre and post-operative examination of patient and manage them.
3. Preventive and Promotive care: This domain includes providing health promotion to preserve and optimize eye health.
4. Palliative and rehabilitative care: This domain includes ability to facilitate the access to low vision services and vision rehabilitation.
5. Communication and Leadership: The domain includes obtaining, discussing and sharing information with patients, their families and everyone involved in caring for the patient. Developing multidisciplinary relationships and partnerships to promote quality, people centered and integrated eye care services and managing available resources for effective delivery of quality eye care.
6. Professionalism: Acts in accordance with professional standards of public good ethical behaviour and practice, commitment and accountability.

#### **2.4.5 Skill Competencies**

<b>S.N.</b>	<b>Competency domain: Non-surgical care</b>	<b>Miller's Competency Level</b>
1	Make general observations of patients	D
2	Obtain case histories	D
3	Formulate examination plans	D
4	Implement examination plans	D



<b>S.N.</b>	<b>Competency domain: Non-surgical care</b>	<b>Miller's Competency Level</b>
5	Assess the ocular adnexa and the eye	D
6	Assess central and peripheral sensory visual function and the integrity of visual pathways	D
7	Assess refractive status	D
8	Assess oculomotor and binocular function	D
9	Assess visual information processing	D
10	Assess the significance of signs and symptoms found incidental to ocular examinations in relation to the patient's eye or general health	D
11	Interpret and analyse findings to establish Diagnoses	D
12	Design management plans for individual patients and implements the plans agreed to with the patients	SH
13	Prescribe spectacles	D
14	Prescribes contact lenses	D
15	Dispense ocular prosthesis	KH
16	Manage patients requiring vision therapy	SH
17	Treat ocular disorders and injuries using appropriate pharmacological treatment regimens within the permissible scope or refers patients appropriately	KH
18	Dispense optical prescriptions accurately	D
19	Provide emergency optometric care	D
20	Manage health information accurately and safely	D

<b>S.N.</b>	<b>Competency domain: Surgical care</b>	<b>Miller's Competency Level</b>
1	Identify patients that require surgical management and refers them appropriately	KH
2	Conduct pre- and post-surgical examinations and observation in collaboration with a surgeon	D
3	Conduct in-theatre objective refraction	D
4	Perform minor surgeries	SH

<b>S.N.</b>	<b>Competency domain: Preventive and promotive care</b>	<b>Miller's Competancy Level</b>
1	Utilize available resources to enhance patient Outcomes	KH
2	Provide advice on vision and eye health and takes protective measures in the workplace and in the social environment	SH
3	Provide First Aid care and basic life support services in the community during need	SH

<b>S.N.</b>	<b>Competency domain: Palliative and rehabilitative care</b>	<b>Miller's Competancy Level</b>
1	Provide for the care of patients with special needs	KH
2	Prescribe low vision devices and non-optical interventions	SH

<b>S.N.</b>	<b>Competency domain: Communication and Leadership</b>	<b>Miller's Competancy Level</b>
1	Communicate effectively with the health care team, the patients, their families, the community and other relevant stakeholders	D
2	Use relevant communication principles to improve patient eye care	D
3	Provide guidance to promote teamwork and collaboration, good work-life balance and a healthy workplace environment	KH
4	Promote quality person-centred integrated eye care services	KH
5	Facilitate opportunities for community eye health services in all sectors	KH
6	Participate in inter-professional health care activities at all levels	KH
7	Manage available resources in a way that facilitates the work of the eye health team in the delivery of services	KH

S.N.	Competency domain: Professionalism	Miller's Competancy Level
1	Use available policies for district level planning and implementation of eye care plans	KH
2	Perform comprehensive clinical interventions, audits and reviews	KH
3	Perform research	KH
4	Promote, plan and facilitate lifelong learning, including continuing professional development	KH
5	Practice within the existing national legal framework governing general and eye care practice	D
6	Practice in accordance with professional ethics and code of conduct	D
7	Adhere to human rights tenets and maintains human dignity	D
8	Maintain a good work-life balance	D

## 2.5 Bachelor of Nursing Science (BNS)

### 2.5.1 Introduction

Bachelor of Nursing Science (BNS) course is targeted to enhance career ladder for PCL nurses. The two stream of bachelor nursing need to be same and equivalent. Therefore, bachelor level health streams should be in same pace in terms of course duration, entry criteria and evaluation criteria. Additionally, elective courses taken during the bachelor degree will not be considered specialization.

### 2.5.2 Program Objectives

After the completion of the course, the graduates will be able to:

1. Apply knowledge from social, psychological and basic sciences in providing holistic care to individual, family and community.
2. Provide nursing care to clients with different health problem in different health care setting.
3. Apply evidence-based practice using nursing process utilizing available resources in hospital and community.
4. Communicate effectively with clients, colleagues and health team members in a variety of health care settings.
5. Demonstrate competency in providing individualized nursing care utilizing nursing process.

6. Demonstrate leadership role in planning, directing, supervising and evaluating nursing care management activities.
7. Demonstrate effective teaching skills in class room, in clinical and community setting
8. Utilize principles of primary health care in planning activities for the promotion and maintenance of health of people.
9. Demonstrate the competency in care of patient with various setting such as Child health nursing, medical surgical nursing, geriatric, critical care, psychiatric, oncology nephrology, school, community setting, etc.
10. Conduct and participate in small scale research studies in hospital or community settings.
11. Exhibit professional behavior in all activities.
12. Provide evidence-based, safe, holistic and clinically competent care to improve patient outcome.
13. Demonstrate effective communication skills with patients, families and colleagues by fostering mutual respect and shared decision making to enhance knowledge, experience and health outcome.
14. Perform health-promotion, risk-reduction and disease-prevention activities for individuals, groups and community people.

### ***2.5.3 Areas of Learning***

1. Integrated Health Sciences : Anatomy and Physiology
2. Integrated Health Sciences : Pathophysiology Microbiology, Pharmacology, Biochemistry
3. Nutrition and Dietetics
4. Nursing Concept and Principles
5. Medical Surgical Nursing
6. Geriatric and Palliative Nursing
7. Social and Behavioural Sciences applied to Nursing
8. Child Health Nursing
9. Psychiatric/Mental Health
10. Educational Science
11. Health Economics and Nursing
12. Midwifery and Gynaecological Nursing
13. Community Health Nursing
14. Research and Biostatistics
15. Leadership and Management

#### 16. Elective Subjects:

- Medical Surgical Nursing
- Community Health Nursing
- Psychiatric Nursing
- Child Health Nursing
- School Health Nursing
- Anaesthesia Nursing
- Cardio-Thoracic and Vascular Nursing
- Critical Care Nursing
- Paediatric Critical Care Nursing
- Geriatric Nursing
- Maternity Nursing
- Nephrology Nursing
- Oncology Nursing
- Emergency Nursing
- Neurology Nursing

#### 2.5.4 Core Competencies

1. **Procedural skill:** Perform the procedure/skill competently and confidently in clinical area or in skill lab.
2. **Patient-Centered Care (Caring):** Provide holistic care that recognizes an individual's preference, values and needs. It also respects the patients and treats them as a full partner in providing compassionate, coordinated and culturally appropriate, safe and effective care.
3. **Communication:** The ability to interact effectively with patient, families and colleagues, fostering mutual respect and shared decision-making to enhance patient satisfaction and health outcomes.
4. **Clinical reasoning:** Performs a complete and appropriate assessment of a patient for the purposes of prevention and health promotion, nursing diagnosis and nursing management.
5. **Leadership:** The leadership in nursing is regarding capability to influence the behavior of individuals or groups of individuals within their environment in a way that will facilitate the establishment and acquisition/achievement of shared goals.
6. **Teaching and Learning:** Comprehend the basic principle of learning and teaching and learning domain. Furthermore, a sense of awareness for health literacy and cooperative learning is determined.
7. **Scholarship for Nursing Practice:** The generation, synthesis, translation, application and dissemination of nursing knowledge to improve health and transform health care.

8. **Research:** Integrate best current evidence with clinical expertise and consideration of patients' preference experience and values for delivering the best quality of care.
9. **Professionalism:** Demonstrate accountability for practicing nursing within established moral, legal, ethical, regulatory and humanistic principles.

S.N.	Competency	Miller's Competency Level
1	Identify major bones, joints, muscles and blood vessels of human body	K
2	Identify and name the bones, fontanelles, suture of foetal skull	K
3	Identify the parts, associated organs and parts of major body organs	K
4	Collect venous blood sample for haematology, biochemistry, immunology and other investigation	KH
5	Perform blood grouping and cross matching	KH
6	Ausculte breath, heart and bowel sound	SH, D
7	Take and analyse pulse from different site, BP, respiration	SH, D
8	Perform and interpret basic waves of ECG	SH, D
9	Measure vital capacity and interpret the result	SH
10	Interpret normal abnormal findings of followings and correlation with disease condition (Sugar, Protein, Albumin, Cholesterol, Bilirubin, Amylase, Alkaline Phosphatase, Urea, Creatinine, T3, T4 and TSH and others)	KH
11	Differentiate the normal and pathological feature of major disease conditions such as osteomyelitis, osteosarcoma, bronchiectasis, tuberculosis myocardial infarction, Peptic ulcer, cholecystitis, etc.	K
12	Collect and dispatch the specimen of different body fluid such as blood, urine, CSF, peritoneal fluid, pleural fluid, etc.	KH
13	Perform Gram stain, AFB stain	D
14	Perform sterilization and disinfection of different items	D
15	Explain pharmacodynamic processes and their role in drug interaction	K
16	Prepare Emergency drugs card	SH, D
17	Calculate drug dose based on age and weight	SH, D

S.N.	Competency	Miller's Competency Level
18	Calculate drug dosing rate and dilution for Intravenous drug infusion	SH, D
19	Calculate the intravenous fluid infusion	SH, D
20	Select a case for case study and present it applying nursing process	D
21	Prepare and implement nursing care plan based on needs and problem concern to promotive, preventive and rehabilitative aspects	D
22	Assisted nursing care to patient with ET tube, tracheostomy and artificial ventilation	D
23	Assist different diagnostic investigations: <ul style="list-style-type: none"> <li>• Glucose tolerance test</li> <li>• Hormone profile</li> <li>• Thyroid scan, renal scan</li> <li>• KUB X-ray</li> <li>• Biopsy: renal, liver, thyroid and other organ/parts</li> <li>• Cystoscopy</li> <li>• Intravenous pyelogram, Retrograde pyelography</li> <li>• Arthroscopy</li> <li>• Myelogram</li> <li>• Lumbar puncture</li> <li>• Electroencephalogram (EEG)</li> <li>• ECG</li> <li>• ECHO</li> <li>• TMT</li> <li>• Ambulatory blood pressure</li> <li>• USG</li> <li>• Endoscopy,</li> <li>• Colonoscopy</li> <li>• Bronchoscopy</li> <li>• PFT</li> <li>• ERCP</li> <li>• Tuning Fork Test,</li> <li>• Audiogram,</li> <li>• Tympanometry</li> <li>• Visual acuity,</li> <li>• Tonometry</li> </ul>	KH/D

S.N.	Competency	Miller's Competency Level
24	Assist CPR procedure	D
25	Provide pre-operative and post-operative nursing care to patient undergoing variety of surgical procedures	D
26	Provide total patient care for unconscious patient	D
27	Assist hemodialysis procedure	D
28	Provide cast care and traction care	D
29	Demonstrate crutch walking (weight bearing, non-weight bearing)	SH
30	Use variety of gadgets (infusion pump, syringe pump, monitor, ventilator)	D
31	Demonstrate insulin administration by considering its complications and also managing complications	KH
32	Provide holistic care for burn patient	D
33	Perform ostoma care	KH
34	Demonstrate emergency management for airway obstruction, organophosphorus poisoning and shock	D
35	Assist in various therapeutic medical procedures: tapping, aspiration, biopsy and many more	K
36	Demonstrate CPR procedure (Skill Lab)	SH
37	Perform dressing with aseptic technique	D
38	Perform health assessment of elderly patients including physical and psycho-social aspect	D
39	Demonstrate ability in enhancing health promotion activities for elderly patients	SH
40	Demonstrate ability in providing palliative and end of life nursing care	KH, SH
41	Teach the elderly patient/care provider/family to promote health and rehabilitate the elderly to maintain their health	SH
42	Communicate effectively with patient and family to allay anxiety	SH, D
43	Perform history taking and mental status examination	D
44	Prepare nursing care plans according to individual needs	SH, D
45	Plan and provide health teaching in the ward setting according to need	SH, D



S.N.	Competency	Miller's Competency Level
46	Assist in different procedures: <ul style="list-style-type: none"> <li>• Care of patients undergoing intra-cranial surgery</li> <li>• Measure and record ICP</li> <li>• Bone marrow aspiration</li> <li>• Plasmapheresis</li> <li>• Pericardiocentesis</li> <li>• Angiogram and percutaneous intervention (angioplasty)</li> <li>• Percutaneous trans mitral commissurotomies (PTMC)</li> <li>• Electrophysiological study (EPS) and radio frequency ablation</li> <li>• Cardioversion and defibrillator</li> <li>• Pacemaker implantation</li> <li>• Abdominal paracentesis</li> <li>• Endoscopy, proctoscopy, sigmoidoscopy, colonoscopy, Endoscopic Retrograde Cholangiopancreatography (ERCP)</li> <li>• Thoracentesis</li> <li>• Chest tube drainage</li> <li>• Arterial Blood Gas (ABG) analysis</li> <li>• Chest physiotherapy (percussion, vibration, deep-breathing exercise, postural drainage, incentive spirometry)</li> <li>• Tracheostomy</li> <li>• Thoracotomy and pneumonectomy</li> <li>• Total parenteral nutrition</li> <li>• Bladder irrigation</li> <li>• Dialysis (Hemodialysis and peritoneal dialysis)</li> </ul>	KH/SH
47	Communicate effectively with clients/families focusing on their special needs	SH
48	Administer psychotropic drugs to the patient and manage the side effects of the drugs	SH
49	Provide nursing care to the patient undergoing electroconvulsive therapy (ECT)	KH
50	Conduct therapeutic sessions /counselling	SH, D
51	Maintain records and documents for clinical communication and medico-legal purposes	SH
52	Present case studies and case presentation	SH

S.N.	Competency	Miller's Competency Level
53	Explain the concept of health and illness	K
54	Conduct physical examination systematically and record the results	SH, D
55	Describe different nursing theories	K
56	Apply nursing theories in a clinical situation	SH
57	Identify the significance of sociology and psychology in nursing	KH
58	Relate how socio-cultural practices influence health and health behaviour	K
59	Identify the food belief and eating practices and its impact on health	K
60	Identify the factors affecting client's selection of the health care provider and utilization of modern health facilities	K
61	Set up the antenatal clinic in the health facility	SH
62	Take health history of the pregnant woman in detail	SH, D
63	Calculate expected date of delivery (EDD) and period of gestation (POG)	SH, D
64	Perform head to toe examination including obstetric examination of the pregnant woman	D
65	Give health teaching to the pregnant women and family members regarding birth preparedness and complication readiness	D
66	Identify and manage the high-risk pregnancy e.g., PIH, hyperemesis, medical disorder associated with pregnancy	KH
67	Provide PMTCT/HIV counselling to pregnant women	SH, D
68	Present history taking of woman in labour	SH
69	Perform and interpret per vaginal examination	SH, D
70	Plot Partograph	SH, D
71	Conduct normal deliveries	SH, D
72	Perform episiotomies and repair perineal tear and episiotomy	SH, D
73	Demonstrate skill to conducting breech deliveries	SH
74	Manage obstetric emergencies such as shoulderdystosia, PPH	SH
75	Demonstrate skill to manual removal of placenta	SH
76	Conduct and assist on breech extraction	SH

S.N.	Competency	Miller's Competency Level
77	Demonstrate helping baby breath and neonate resuscitation	SH
78	Perform daily assessment of postnatal mother and newborn baby and provide care accordingly	SH, D
79	Identify and manage danger signs of mother and newborn	KH
80	Prepare social map of assign community	SH
81	Provide health education to individual, families and communities on different topics	SH, D
82	Conduct community health survey and use data to plan health actions with a family or community people	SH, D
83	Apply the epidemiological approaches in solving the identified problems	K
84	Identify and manage the high-risk neonate, mother and children in the community using nursing process.	KH
85	Conduct FP and immunization programs as a member of health team	SH
86	Perform vaccination to children and women according to national protocol	SH, D
87	Provide family planning counseling and services including Depo, IUCD, implant	SH, D
88	Provide care of high-risk family through home visiting	SH
89	Carry out health exhibition / action	SH, D
90	Monitor growth and development of children of different age group by using height, weight, measurement and others	SH, D
91	Perform admission and discharge procedure of children	D
92	Implement the nursing process according the need of children	SH
93	Present case study and presentation to children from infancy to adolescence with various disorders	SH, D
94	Operate and provide care to the child in warmer, phototherapy	SH, D
95	Operate warmer, incubator, syringe pump, infusion pump, ventilator and other gadgets	KH
96	Prepare and provide therapeutic play for children according to their age group	SH

S.N.	Competency	Miller's Competency Level
97	Provide care based on the concept of integrated management of childhood illness in assessing children with different health challenges	SH
98	Monitor the growth and development of children of different age group by using height, weight, measurement and others	SH
99	Perform IV cannulations for neonate, toddlers and other children	D
100	Perform IV infusions and maintain drop rate for different medications	D
101	Perform medication procedures e.g., Oral, intramuscular, intravenous, subcutaneous, intradermal and nebulization, etc.	D
102	Administer oxygen by using different devices e.g., mask, nasal canula, etc.	D
103	Formulate learning objectives using appropriate action verbs following Bloom's Taxonomy	KH
104	Develop lesson plan with clearly stated objectives, contents, teaching-learning activities, time and evaluation.	SH, D
105	Prepare and implement of teaching plan in classroom and clinical setting	SH, D
106	Perform microteaching	SH, D
107	Demonstrate effective teaching performance in classroom as well as in clinical setting	SH, D
108	Develop procedure checklist to evaluate the students	SH, D
109	Prepare evaluation tools to assess student learning in classroom and clinical settings	SH, D
110	Develop master plan and rotation plan of a respective year	SH, D
111	Prepare assignment and supervise of junior students	SH
112	Select research problem and develop research Proposal	SH
113	Prepare instrument for the research study and finalize for data collection	SH
114	Collect data considering ethical aspects of the subjects	SH
115	Analyse and present research data by using different tools	SH
116	Prepare the research report using the guideline provided	SH

S.N.	Competency	Miller's Competency Level
117	Ward / Community / Campus management Perform role of the ward in-charge at least one week in respective ward	SH, D
118	Develop and implement the continuity nursing care plan	SH, D
119	Identify the need in the ward and perform the change process	SH, D
120	Prepare daily assignments for the staff routine work and patients care	SH, D
121	Prepare duty roster of junior, colleagues and ward staff	SH, D
122	Develop a procedure manual used in the respective ward	SH, D
123	Develop and implement the staff performance appraisal form	SH, D
124	Conduct meeting in the ward	SH, D
125	Identify learning need of staff and conduct in-service education	SH
126	Identify and assist to solve administrative problems such as staff problem, supply and equipment problem, communication problems	KH
127	Participate in mobile clinics activities: <ul style="list-style-type: none"> <li>• Medical Surgical Nursing</li> <li>• Community Health Nursing</li> <li>• Psychiatric Nursing</li> <li>• Child Health Nursing</li> <li>• Critical Care Nursing</li> <li>• Paediatric Critical Care Nursing</li> <li>• Geriatric Nursing</li> <li>• Maternity Nursing</li> <li>• Nephrology Nursing</li> <li>• Oncology Nursing</li> <li>• Emergency Nursing</li> <li>• Cardio Thoracic and Vascular Nursing</li> <li>• Neurology Nursing</li> <li>• School Health Nursing</li> </ul>	SH

### 2.5.5 Skill Competencies

S.N.	Procedure/Core skills	Miller's Competency Level
1	Perform intravenous cannulation for adult and children	D
2	Provide medication through different route	D
3	Transfuse whole blood and its components	D
4	Prepare emergency drug cart	SH
5	Take twelve leads ECG and interpret findings	SH
6	Perform basic suturing in emergency/ ward	SH, D
7	Draw blood sample and dispatch in lab correctly	D
8	Assist cardiopulmonary resuscitation (CPR) for adult, neonate and children	SH
9	Monitor blood glucose via glucometer and interpret result	D
10	Examine neonates systematically	D
11	Preparation of slides for malaria and kalazar	SH
12	Preparation sputum smear	SH
13	Perform urinary catheterization for male and female (neonate and child)	D
14	Perform NG tube insertion and feeding for child	D
15	Perform nasal/ oral suctioning for child	D
16	Provide pre and post operative nursing care	D
17	Perform glucose tolerance test	SH
18	Give insulin injection (various types)	D
19	Assist in crutches walking and care of patient with special orthopedic devices: cast and traction, crutches, cane	SH
20	Measure and record ICP	SH
21	Care of patient with chest tube drainage	SH, D
22	Assist in dialysis (haemodialysis and peritoneal dialysis)	KH,SH
23	Care of patient in mechanical ventilator	KH,SH
24	Care of patient with tracheostomy	SH
25	Perform Triage	SH
26	Perform psychiatric history taking	SH,D
27	Perform Mental Status Examination	SH, D
28	Perform antenatal examination	D
29	Perform per vagina examination	D

S.N.	Procedure/Core skills	Miller's Competency Level
30	Plot partograph and interpret the findings	D
31	Conduct normal delivery	D
32	Perform episiotomy	SH,D
33	Repair episiotomy/ perineal tear	SH,D
34	Perform technique of conducting breech delivery	SH
35	Conduct vacuum delivery	SH
36	Perform technique of management of shoulder dystocia	SH
37	Manage post partum haemorrhage	SH
38	Provide post abortion care	SH
39	Care of patient with medical abortion and manual vacuum aspiration	SH
40	Manage woman with convulsion, induction and maintenance of magnesium sulphate	K
41	Perform and interpret CTG	SH,D
42	Perform Active management of third stage of labour	D
43	Support in forceps and caesarean delivery	KH
44	Perform placenta examination	D
45	Manage LBW baby with kangaroo mother care	D
46	Manage baby under radiant warmer and phototherapy care	D
47	Give baby bath	D
48	Perform clinical breast examination and instruct for self-breast examination	SH, D
49	Perform VIA, Pap smear	D
50	Assist in cervical biopsy and mammography	KH
51	Insert and manage uterine pessary	KH, SH
52	Perform immediate care of new born	D
53	Perform vaccination of children and pregnant women as per the national immunization program	D
54	Provide FP services including counselling	D
55	Community diagnosis and health action	D
56	Conduct school health program	D
57	Perform nutritional assessment of individuals in community setting	D

S.N.	Procedure/Core skills	Miller's Competency Level
58	Provide family health nursing care by using family health nursing process	D
59	Perform mental status examination	D
60	Conduct individual counseling sessions for client with psychological problem	D
61	Conduct group therapy session for psychiatric patients	D
62	Conduct classroom room and clinical teaching	D
63	Prepare lesson plan	D
64	Take Micro-teaching	D
65	Develop and use evaluation tool	D
66	Conduct small scale research study using research process	D
67	Implement change process	D
68	Conduct meeting and write minuting	D
69	Identify and provide in-service education	D
70	Develop and use various checklist for procedure	D
71	Identify the requirement of different macro and micro nutrient for different age group	K
72	Calculate energy requirement of different age group.	SH
73	Identify the different nutritional disorders and their management	K, SH
74	Conduct nutritional assessment	D
75	Prepare food pyramid and therapeutic diet	D

## 2.6 Bachelor of Science in Nursing (B.Sc. Nursing)

### 2.6.1 Introduction

The emerging need for quality education in Nepal to reform in accessibility, equality and relevancy, deems crucial for competent health service. Currently, Nursing schools in Nepal have their own curriculum which delivers the content independently. Moreover, the curriculum does not clearly define the competencies and there can be seen the mismatch between theory and practice which hinders the development of competent nurses to meet the health needs of the population in the country

National Health Policy, 2076 and National Education Policy, 2076 have emphasized about the development and expansion of trained and competent health workforce with appropriate skill mix to ensure quality health care universally accessible and effective, focus



on production of specialized human resources and develop and implement integrated and competency-based curriculum in medical education. Medical education is the corner stone to build up firm pillar and base for medical education. Therefore, curriculum framework is an effort to harmonize the diversity in curriculum contents and competencies of different universities in Nepal.

To address the demand for uniformity in core knowledge and competencies and improve the quality of nursing education in order to produce competent nurses MEC has taken the lead for the development of common competency-based curriculum framework. The curriculum further provides useful tool for providing competent professional nurse in the country to respond to priority health needs and emerging issues by providing holistic nursing care that is ethical, safe and evidence-based to positively impact the health and quality of life of individuals, families, groups and communities.

B.Sc. Nursing program aims at preparing competent graduate nurses to provide independent nursing care as members of health teams at various levels of prevention (primordial to tertiary level), manage client care in the hospital as well as the community settings, teach in nursing programs and participate in research activities.

### ***2.6.2 Program Objectives***

On completion of this program, the students will be able to:

1. Utilize sound knowledge in planning and providing comprehensive care to the clients.
2. Communicate effectively with individuals and groups in different settings.
3. Carry out diagnostic and therapeutic nursing measures competently.
4. Provide nursing care to clients with different health problems utilizing know
5. Utilize knowledge from basic sciences competently.
6. Demonstrate competency in providing individualized nursing care utilizing nursing process.
7. Demonstrate leadership role in planning, directing, supervising and evaluating nursing care activities.
8. Demonstrate effective teaching skills in educating individuals and groups.
9. Demonstrate understanding of the socio-cultural beliefs and practices, which influence individuals' responses to health and illness.
10. Demonstrate effective communication skills with patients, families and colleagues by fostering mutual respect and shared decision making to enhance knowledge, experience and health outcome.
11. Demonstrate competent in providing care to patient with different health problems.
12. Demonstrate cultural sensitivity and competency while providing nursing care to individuals, families and groups in the community.

13. Utilize principles of primary health care in planning activities for the maintenance of health of people.
14. Demonstrate positive attitude in all aspects of professional relationships.
15. Provide evidence-based, safe, holistic and clinically competent care to improve patient outcome.
16. Take responsibility to seek knowledge for personal and professional growth.
17. Conduct and participate in research activities for development of nursing profession.

### ***2.6.3 Areas of Learning***

1. Integrated Health Science
2. Fundamental of Nursing
3. Community Health Nursing
4. Nursing Concept and Principle
5. Medical- Surgical Nursing
6. Psychiatric Nursing
7. Geriatric and Palliative Nursing
8. Nutrition and Diet Therapy
9. Social and Behavior Science
10. Prenatal /Antenatal Care
11. Natal /Delivery Care
12. Postnatal and Neonatal Care
13. Gynecological Nursing
14. Child Health Nursing
15. Health Economics and Nursing
16. Leadership and Management
17. Education Science
18. Research and Biostatistics
19. Elective Subject
  - Critical Nursing
  - Pediatric Critical Care Nursing
  - Geriatric Nursing
  - Maternity Nursing
  - Nephrology Nursing
  - Oncology Nursing
  - Emergency Nursing
  - Neurology Nursing

#### 2.6.4 Core Competencies

1. **Procedural skill:** perform the procedure/skill competently and confidently in clinical area or in skill lab.
2. **Patient-Centered Care (Caring):** Provide holistic care that recognizes an individual's preference, values and needs. It also respects the patients and treats them as a full partner in providing compassionate, coordinated and culturally appropriate, safe and effective care.
3. **Communication:** The ability to interact effectively with patient, families and colleagues, fostering mutual respect and shared decision-making, to enhance patient satisfaction and health outcomes.
4. **Clinical reasoning:** Performs a complete and appropriate assessment of a patient for the purposes of prevention and health promotion, nursing diagnosis and nursing management.
5. **Leadership:** The leadership in nursing is regarding capability to influence the behavior of individuals or groups of individuals within their environment in a way that will facilitate the establishment and acquisition/achievement of shared goals.
6. **Teaching and Learning:** Comprehend the basic principle of learning and teaching and learning domain. Furthermore, a sense of awareness for health literacy and cooperative learning is determined.
7. **Scholarship for Nursing Practice:** The generation, synthesis, translation, application and dissemination of nursing knowledge to improve health and transform health care.
8. **Research:** Integrate best current evidence with clinical expertise and consideration of patients' preference experience and values for delivering the best quality of care.
9. **Professionalism:** Demonstrate accountability for practicing nursing within established moral, legal, ethical, regulatory and humanistic principles.

S.N.	Competency	Miller's Competency Level
1	Identify major bones, joints, muscles and blood vessels of human body	K
2	Identify and name the bones, fontanelles, suture of fetal skull	K
3	Identify the parts, associated organs and parts of major body organs	K
4	Collect venous blood sample for haematology, biochemistry, immunology and other investigation.	SH
5	Perform blood grouping and cross matching	KH

S.N.	Competency	Miller's Competency Level
6	Auscultate breath, heart and bowel sound	SH
7	Take and analyse pulse from different site, BP, respiration	SH
8	Perform and interpret basic waves of ECG	SH
9	Measure vital capacity and interpret the result	SH
10	Collect venous blood sample for haematology, biochemistry, immunology and other investigation	SH
11	Interpret normal abnormal findings of followings and correlation with disease condition (Sugar, Protein, Albumin, Cholesterol, Bilirubin, Amylase, Alkaline Phosphatase, Urea, Creatinine, T3, T4 and TSH and others)	KH
12	Differentiate the normal and pathological feature of major disease conditions such as osteomyelitis, osteosarcoma, bronchiectasis, tuberculosis myocardial infarction, Peptic ulcer, cholecystitis, etc.	K
13	Collect and dispatch the specimen of different body fluid such as blood, urine, CSF, peritoneal fluid, pleural fluid, etc.	SH
14	Perform Gram stain, AFB stain	SH
15	Perform sterilization and disinfection of different items	SH
16	Collect and dispatch the specimen of different body fluid such as blood, urine, CSF, peritoneal fluid, pleural fluid, etc.	SH
17	Perform sterilization and disinfection of different items	SH
18	Explain pharmacodynamic processes and their role in drug interaction.	K
19	Prepare emergency drugs cart	SH
20	Calculate drug dose based on age and weight	SH
21	Calculate drug dosing rate and dilution for Intravenous drug infusion	SH
22	Calculate the Intravenous Infusion	SH
23	Apply skills to provide safety to the patients, positioning and suctioning	KH
24	Implement different nursing measures to fulfill the physical needs and comfort of the patients according to Maslow's hierarchy	KH
25	Operate different types of bed making	SH

S.N.	Competency	Miller's Competency Level
26	Check and interpret vital signs – TPR, BP, SpO <sub>2</sub> , pain, height and weight	SH
27	Carry out the basic nursing procedures such as skin care, body bath, positioning, bandaging, pre and post operative nursing care, etc.	SH
28	Perform admission /discharge procedure	SH
29	Apply infection control measures as appropriate including hand washing, disinfection	SH
30	Perform comfort measures such as positioning, suctioning, active and passive exercise, etc.	SH
31	Prepare social map of assign community	SH
32	Provide health education to individual, families and communities on different topics	SH
33	Conduct community health survey and use data to plan health actions with a family or community people	SH
34	Apply the epidemiological approaches in solving the identified problems	K
35	Identify and manage the high-risk neonate, mother and children in the community using nursing process	KW
36	Conduct FP and immunization programs as a member of health team	SH
37	Perform vaccination to children and women according to national protocol	SH
38	Provide family planning counseling and services including Depo, IUCD, implant	S H
39	Participate in community level health activities in field areas health institution	SH
40	Perform health screening for school children	SH
41	Provide health teaching to community, school children	SH
42	Provide care of high-risk family through home visiting	SH
43	Carry out Health exhibition	SH
44	Present the community health action report	SH
45	Identify the daily requirement of nutrition for different disease condition and developmental stage/age group	K

S.N.	Competency	Miller's Competency Level
46	Demonstrate the preparation and serving of therapeutic diet as sarbottam pitho, weaning foods, renal diet, diabetic diet, etc.	SH
47	Display the different sources of nutrients	SH
48	Record the log book	SH
49	Select a case for study and presentation	KH
50	Prepare the nursing care plan based on needs and problem concern to curative, promotive, preventive and rehabilitative aspects	KH
51	Assist/perform different diagnostic investigation: <ul style="list-style-type: none"> <li>• Hormone profile</li> <li>• Thyroid scan, renal scan</li> <li>• KUB X-ray</li> <li>• Biopsy: renal, liver, thyroid and other organ/parts</li> <li>• Cystoscopy</li> <li>• Intravenous pyelogram, Retrograde pyelography</li> <li>• Arthroscopy</li> <li>• Myelogram</li> <li>• Lumbar puncture</li> <li>• Electroencephalogram (EEG)</li> <li>• EEG</li> <li>• ECHO</li> <li>• TMT</li> <li>• Ambulatory blood pressure</li> <li>• USG</li> <li>• Endoscopy</li> <li>• Colonoscopy</li> <li>• Bronchoscopy</li> <li>• PFT</li> <li>• ERCP</li> <li>• Tuning Fork Test</li> <li>• Audiogram</li> <li>• Tympanometry</li> <li>• Visual acuity</li> <li>• Tonometry</li> </ul>	KH/SH
52	Apply the formulated nursing care plan in patient care based on assessment	SH

S.N.	Competency	Miller's Competency Level
53	Provide nursing care to patient with ET tube, tracheostomy and artificial ventilation	KH
54	Assist in CPR procedure	KH
55	Provide pre-operative and post-operative nursing care to patient undergoing different types of surgical procedures	SH
56	Provide total care for unconscious patient	SH
57	Assist and care of patient during hemodialysis procedure	KH
58	Provide cast and traction care	KH
59	Demonstrate crutch walking (weight bearing non weight bearing)	SH
60	Use variety of gadgets (infusion pump, syringe pump, monitor, ventilator)	SH
61	Demonstrate insulin administration	SH
62	Provide holistic care for burn patient	KH
63	Perform dressing with aseptic technique	SH
64	Provide emergency care for myocardial infarction (MI) patient	K
65	Assist in CPR procedure (ward/ emergency department/ skill lab)	SH
66	Demonstrate emergency management for airway obstruction	KH
67	Assist in various therapeutic medical procedures: tapping, aspiration, biopsy and many more	KH
68	Assist for Syringing, foreign body removal, Audiogram, endoscopic procedures related to nose and throat disorders, etc.	KH
69	Provide comprehensive nursing care to the adult patients with Eye, ENT problems by using nursing process	SH
70	Perform as a role of scrub nurse, circulatory nurse for at least four major cases and five minor cases	SH
71	Assist in anesthesia	KH
72	Take care of the patient in the recovery room	KH
73	Provide immediate post operative care	SH
74	Identify different instruments used in different operative procedures	SH

S.N.	Competency	Miller's Competency Level
75	Assist in different procedures: <ul style="list-style-type: none"> <li>• Care of patients undergoing intra-cranial surgery</li> <li>• Measure and record ICP</li> <li>• Bone marrow aspiration</li> <li>• Plasmapheresis</li> <li>• Pericardiocentesis</li> <li>• Angiogram and percutaneous intervention (angioplasty)</li> <li>• Percutaneous trans mitral commissurotomy (PTMC)</li> <li>• Electrophysiological study (EPS) and radio frequency ablation</li> <li>• Cardioversion and defibrillator</li> <li>• Pacemaker implantation</li> <li>• Abdominal paracentesis</li> <li>• Endoscopy, proctoscopy, sigmoidoscopy, colonoscopy, Endoscopic Retrograde Cholangiopancreatography (ERCP)</li> <li>• Thoracentesis,</li> <li>• Chest tube drainage</li> <li>• Arterial Blood Gas (ABG) analysis</li> <li>• Chest physiotherapy (percussion, vibration, deep-breathing exercise, postural drainage, incentive spirometry)</li> <li>• Tracheostomy</li> <li>• Thoracotomy and pneumonectomy</li> <li>• Total parenteral nutrition</li> <li>• Bladder irrigation</li> <li>• Dialysis (Hemodialysis and peritoneal dialysis)</li> </ul>	KH/SH
76	Prepare different OT set for specific OT procedure e.g laparotomy set, caesarean section, etc.	SH
77	Perform health assessment of elderly patients including physical and psycho-social aspect	SH
78	Demonstrate ability in enhancing health promotion activities for elderly patients	SH
79	Demonstrate ability in providing palliative and end of life nursing care	SH
80	Teach the elderly patient/care provider, family to promote health and rehabilitate the elderly to maintain their health	SH



S.N.	Competency	Miller's Competency Level
81	Communicate effectively with patient and family to allay anxiety	K
82	Perform history taking and physical examination of Psychiatric clients	SH
83	Prepare nursing care plans according to the individual needs	SH
84	Plan and provide health teaching according to need	SH
85	Communicate effectively with client/family focusing on their special needs	SH
86	Administer psychotropic drugs to the patient and manage side effects of the drugs	K
87	Provide nursing care to the patient undergoing electro convulsive therapy (ECT)	SH
88	Conduct therapeutic sessions /counseling	SH
89	Maintain records and documents for clinical communication and medico-legal purposes	SH
90	Develop nursing care plan for the patient with psychiatric conditions	SH
91	Interpret the concept of health and illness	K
92	Identify the factors which affect pain perception and response in individuals	K
93	Conduct physical examination systematically and record the results	SH
94	Develop nursing care plan based on assessment findings	SH
95	Apply nursing theories in a clinical situation	SH
96	Identify the significance of sociology and psychology in nursing	K
97	Relate how socio-cultural practices influence health and health behaviour	K
98	Identify the food belief and eating practices and its impact on health	K
99	Identify the factors affecting client's selection of the health care provider and utilization of modern health facilities	K
100	Set up the antenatal clinic in the health facility	SH
101	Take health history of the pregnant woman in detail	SH

S.N.	Competency	Miller's Competency Level
102	Calculate expected date of delivery (EDD) and period of gestation (POG)	SH
103	Perform head to toe examination including obstetric examination of the pregnant woman	SH
104	Prepare and perform antenatal screening tests: Pregnancy test Urine, Urine albumin, urine sugar, OGT, OGTT	KH
105	Provide health teaching to the pregnant women	SH
106	Prepare women and family members regarding birth preparedness and complication readiness	SH
107	Communicate effectively with the pregnant woman and family	SH
108	Differentiate between normal and deviated condition during pregnancy	KH
109	Identify the high-risk pregnancy e.g., PIH, pre-eclampsia and eclampsia and refer accordingly	K
110	Perform / Assist in management of women with pre-eclampsia and eclampsia	SH
111	Provide PMTCT/HIV counseling to pregnant women	SH
112	Administration of Magnesium sulphate	SH
113	Perform admission procedure for woman to labour unit with complete history and obstetric examination	SH
114	Perform and interpret per vaginal examination	SH
115	Plot and take clinical decision based on partograph	SH
116	Conduct normal deliveries	SH
117	Perform episiotomies	SH
118	Repair perineal tears/episiotomy	SH
119	Demonstrate skill to conducting breech deliveries	SH
120	Demonstrate skill on managing obstetric complication such as shoulder dystosia, PPH, retained placenta	SH
121	Demonstrate skill to conducting manual removal of placenta	SH
122	Demonstrate skill to conducting breech extraction	SH
123	Demonstrate skill to conducting Neonate resuscitation (helping baby breath) (practices in skill lab)	SH

S.N.	Competency	Miller's Competency Level
124	Perform the postpartum procedures such as Perineal care, Neonatal assessment, Postnatal assessment, Baby bath	SH
125	Identify and manage the problems of postnatal mother and newborn baby	KH
126	Perform daily assessment of the newborn baby and provide care accordingly	KH
127	Provide health teaching to mothers and families	KH
128	Assist in successful breast feeding	SH
129	Identify and manage danger signs of mother and newborn	KH
130	Counsel and provide postpartum contraception	SH
131	Perform clinical breast examination and teach the technique of self breast examination	SH
132	Perform pelvic examination	KH
133	Perform VIA and pap smear test	SH
134	Assist in gynecological procedure such as endometrial biopsy, mammography, etc.	SH
135	Demonstrate skill on medical abortion and manual vacuum aspiration	SH
136	Monitor growth and development of children of different age group by using height, weight, measurement and others	SH
137	Perform admission and discharge procedure of children	SH
138	Implement the nursing process according the need of children	SH
139	Perform case study and presentation to children from infancy to adolescence with various disorders	SH
140	Operate and provide care to the child in warmer, phototherapy	SH
141	Operate warmer, incubator, syringe pump, infusion pump, ventilator and other gadgets	KH
142	Prepare and provide therapeutic play for children according to their age group	SH
143	Formulate learning objectives using appropriate action verbs following Bloom's Taxonomy	SH

S.N.	Competency	Miller's Competency Level
144	Develop lesson plan with clearly stated objectives, contents, teaching-learning activities, time and evaluation	SH
145	Prepare and implement of teaching plan in classroom and clinical setting	SH
146	Perform microteaching	SH
147	Demonstrate effective teaching performance in classroom as well as in clinical setting	SH
148	Develop procedure checklist to evaluate the students	SH
149	Prepare evaluation tools to assess student learning in classroom and clinical settings	SH
150	Develop master plan and rotation plan of a respective year	SH
151	Prepare assignment and supervise of junior students	SH
152	Develop and defend research proposal	SH
153	Prepare and use instrument for the research study and finalize for data collection	SH
154	Collect data considering ethical aspects of the subjects	SH
155	Analyze the data using appropriate statistical methods	SH
156	Prepare the research report using the guideline provided	SH
157	Prepare the research report using the guideline provided	SH
158	Perform role of the ward in-charge at least one week in respective ward	SH
159	Develop and implement the continuity nursing care plan	SH
160	Identify and manage change process	SH
161	Prepare duty roaster and daily assignment of the staff and patients	SH
162	Develop and implement the staff performance appraisal form	SH
163	Conduct meeting in the ward and write minuting	SH
164	Identify learning need of staff and conduct in-service education	SH
165	Identify and solve administrative problems such as Staff problem, Supply and equipment problem, Communication problems, etc.	SH
166	Participation in mobile clinics activities	SH

S.N.	Competency	Miller's Competency Level
167	Visit different government and non-government organization and present the report	SH
168	Observe and perform the administrative and academic responsibilities of the campus chief. (Personnel, general, financial, library and hostel) and present the report	KH

### 2.6.5 Skill Competencies

S.N.	Procedure	Miller's Competency Level
1	Take complete history and conduct physical examination	D
2	Maintain universal precaution	D
3	Give medication through different route such as intramuscular, intravenous, intradermal, subcutaneous	D
4	Perform intravenous cannulation for adult and children	D
5	Use special gadget like (cardiac monitor, syringe pump, Infusion pump)	SH
6	Preparation for slides for malaria and kalazar and sputum smear	D
7	Nursing procedure : <ul style="list-style-type: none"> <li>• Bed making</li> <li>• Mouth care</li> <li>• Sponge bath</li> <li>• Skin care</li> <li>• Hair care</li> <li>• Nail care</li> <li>• Perineal care</li> <li>• Catheterization</li> <li>• Enema</li> <li>• Dressing</li> <li>• Nasogastric tube insertion</li> <li>• Tube feeding</li> </ul>	D
8	Hot and cold application	D
9	Dressing and bandaging	D
10	Pre and post operative nursing care	D

S.N.	Procedure	Miller's Competency Level
11	Give medication through different route: <ul style="list-style-type: none"> <li>• Oral</li> <li>• Topical</li> <li>• Nasal</li> <li>• Ophthalmic</li> <li>• Intra vaginal</li> <li>• Intra rectal</li> <li>• Sublingual</li> <li>• Inhalation</li> <li>• Instillation</li> <li>• Intradermal</li> <li>• Intravenous</li> <li>• Subcutaneous</li> <li>• Intramuscular</li> </ul>	D
12	Take twelve leads ECG and interpret simple deviation	SH
13	Perform basic suturing in emergency/ward	D
14	Draw blood sample and dispatch in lab correctly	D
15	Perform cardiopulmonary resuscitation (CPR) for adult, neonate and children	SH
16	Monitor blood glucose via glucometer and interpret result	D
17	Examine neonates systematically	D
18	Preparation of slides for malaria and kalazar	D
19	Sputum smear preparation	D
20	Perform urinary catheterization for male and female (neonate and child)	D
21	Perform NG tube insertion and feeding for child	D
22	Perform nasal/ oral suctioning for child	D
23	Provide pre and post operative nursing care	D
24	Perform glucose tolerance test	D
25	Give insulin injection (various types)	D
26	Assist in crutches walking and care of patient with special orthopedic devices: cast and traction, crutches, cane	SH
27	Measure and record ICP	SH/D
28	Care of patient with chest tube drainage	SH/D

S.N.	Procedure	Miller's Competency Level
29	Assist in dialysis (haemodialysis and peritoneal dialysis)	KH/SH
30	Care of patient in mechanical ventilator	KH/SH
31	Care of patient with tracheostomy	KH/SH
32	Triage	D
33	Psychiatric history taking	SH/D
34	Mental status examination	KH/SH
35	Perform antenatal examination	D
36	Perform per vagina examination	D
37	Plot partograph and interpret the findings	D
38	Conduct normal delivery	D
39	Perform episiotomy	D
40	Repair episiotomy/perineal tear	D
41	Perform technique of conducting breech delivery	SH
42	Conduct vacuum delivery	SH
43	Perform technique of management of shoulder dystocia	SH
44	Manage post-partum haemorrhage	D
45	Provide post abortion care	SH
46	Perform medical abortion and manual vacuum aspiration	SH
47	Manage woman with convulsion, induction and maintenance of magnesium sulphate	KH
48	Perform and interpret CTG	D
49	Active management of third stage of labour	D
50	Support in forceps and caesarean delivery	KH
51	Perform placenta examination	D
52	Manage LBW with kangaroo mother care	D
53	Manage baby under radiant warmer and phototherapy care	D
54	Give baby bath	D
55	Perform clinical breast examination and instruct for self-breast examination	SH/D
56	Perform VIA, Pap smear	SH/D
57	Assist in cervical biopsy and mammography	KH
58	Insert and manage uterine pressary	KH, SH

S.N.	Procedure	Miller's Competency Level
59	Perform immediate care of new born	D
60	Perform vaccination of child and pregnant woman as per national immunization program	D
61	Provide FP services including counseling	D
62	Community diagnosis and health action	D
63	Conduct school health program	D
64	Perform mental status examination	D
65	Conduct individual counseling session for client with psychological problem	D
66	Conduct group therapy session	D
67	Conduct classroom room and clinical teaching	D
68	Prepare lesson plan	D
69	Take Micro-teaching	D
70	Develop and use evaluation tool	D
71	Conduct small scale research study using research process	D
72	Implement change process	D
73	Conduct meeting and write minuting	D
74	Identify and provide in-service education	D
75	Develop and use various checklist for procedure	D

## 2.7 Bachelor in Public Health (BPH)

### 2.7.1 Introduction

The BPH program was started in Institute of medicine in 1986 under Tribhuwan University. It prepares students to pursue careers in different field which are not limited to the public, private or nonprofit sector such as public health, environmental health, health administration, epidemiology, nutrition, maternal and child health, biostatistics, health policy, planning and research.

Bachelor in Public Health in all of the universities are conducting four years program/eight semesters. The course aims to prepare competent graduates with advanced knowledge with the practical skills necessary to deliver high quality public health services needed for the country. It also aims to prepare professional public health specialist with appropriate technical and managerial competencies required for the province and local level health programs which include but not limited to problem identification, planning,



implementation, training, health education and health research. The qualities of public health education in these institutions are also seriously affected by a set of common challenges.

### ***2.7.2 Program Objectives***

1. To assess community health plan for evidence based problem solving in line with the situation faced and community contexts.
2. To perform evidence based health promotion and disease prevention projects, management, administration and implementation through team work, participation and democracy.
3. To supervise health personnel and assist provincial and local development organizations that are concerned with public health.
4. To provide quality technical support concerned with local community health to population and the organizations.
5. To conduct research for solving local community health problem, having initiative thinking and enthusiasm in continuing academic progress.
6. To serve as responsible public health professionals through attitudes and performance consistent with legality, moral and respect for human rights.

### ***2.7.3 Areas of Learning***

1. Public Health and Primary Health Care /Introduction to Public Health
2. Basic Health Science : Anatomy, Physiology, Pharmacology and Toxicology, Pathology, Biochemistry, Microbiology, Entomology, Rodentology and First Aid
3. Professional English
4. Food and Nutrition/Public Health Nutrition
5. Biostatistics/Public Health Statistics
6. Environmental Health
7. Demography/Population Studies
8. Health Informatics
9. Family Health
10. Epidemiology (Communicable and Non-Communicable Diseases)
11. Health Promotion and Education
12. Medical Sociology and Medical Anthropology
13. Public Health Administration and Management
14. Applied Family Health
15. Applied Environmental Health
16. Occupational Health and Safety
17. Community Health Diagnosis and Program Implementation Strategies

18. Applied Epidemiology/Epidemiological Methods and Management
19. Health Economics and Health Financing
20. Health System Management in Nepal
21. Applied Health Promotion and Education
22. School and Community Health (Mental, Oral, Eye and ENT Health)
23. Municipality Health System Management
24. Human Resource for Health Development
25. Disaster Management
26. Public Health Research Methodology
27. Research and Evidence based Public Health Practices
28. Public Health Project Planning and Development
29. International Health/Global Health
30. Health Monitoring and Evaluation
31. Public Health Policies, Laws and Acts

#### **2.7.4 Core/Skill Competencies**

1. Policy Development/Program Planning Skills
2. Effective Communication Competency
3. Cultural Competency
4. Community Dimensions of Practice Competency
5. Public Health Sciences Competency
6. Financial Planning and Management Competency
7. Analytical/Assessment Competency

S.N.	Competency	Miller's Competency Level
1	Describe factors affecting the health of a community (e.g., equity, education, environment)	KH
2	Identify, describe and use quantitative and qualitative data and information (e.g., vital statistic, electronic health records, community input, health equity impact assessment) that can be used for assessing the health of a community	KH, SH
3	Applies ethical principles in assessing, collecting, analyzing, maintaining and disseminating data and information.	D
4	Collect valid reliable and complete data	D
5	Describe, identify assets and resources that can be used for improving the health of a community (e.g., Clubs, academic institution)	KH, SH

S.N.	Competency	Miller's Competency Level
6	Describes how evidence (e.g, data, findings reported in peer-reviewed literature) is used in decision making	KH
7	Gathers information relevant to specific public health policy issues	SH
6	Describes how policy options can influence public health programs	KH
9	Describes the public health laws and regulations governing public health programs	K
10	Participates in program planning processes	D
11	Identifies mechanisms to monitor and evaluate programs for their effectiveness and quality	KH, SH
12	Describes how public health informatics is used in developing, implementing, evaluating and improving policies, programs and services (e.g., integrated data systems, electronic reporting, knowledge management systems, geographic information systems)	KH
13	Communicates in writing and orally, in person and through electronic means, with linguistic and cultural proficiency	D
14	Communicates information to influence behavior and improve health (e.g uses social marketing methods, consider behavioral theories such as the Health Facilitates communication among individuals, groups and organizations	SH
15	Applies communication and group dynamic strategies in interactions with individuals and groups	SH
16	Describes the concept of diversity as it applies to individuals and populations (e.g., culture, values, socioeconomic status)	K
17	Recognizes and address the contribution of diverse perspectives in developing, implementing and evaluating policies, programs and services that affect the health of a community	KH
18	Describes the effects of policies, programs and services on different populations in a community	K
19	Describes the programs and services provided by governmental and non governmental organizations to improve the health of a community	K

S.N.	Competency	Miller's Competency Level
20	Recognizes community linkages and relationships among multiple factors (or determinants) affecting health	KH
21	Demonstrates the capacity to work in community-based participatory research efforts	KH, SH
22	Identifies stakeholders and collaborates with community partners to promote the health of the population	KH, SH
23	Describes the scientific foundation of the field of public health and environment	K
24	Identifies prominent events in the history of public health (e.g., small pox eradication, development of vaccinations, infectious disease control, safe drinking water, emphasis on hygiene and hand washing, access to health care for people with disabilities)	K, KH
25	Describes how public health sciences (e.g., biostatistics, epidemiology, environmental health sciences, health services administration, social and behavioral sciences and public health informatics) are used in the delivery of the 10 Essential Public Health Services	KH
26	Describes the scientific evidence related to a public health issue, concern or intervention	KH
27	Retrieves evidence (e.g., research findings, case reports, community surveys) from print and electronic sources (e.g., PubMed, Journal of Public Health Management and Practice) to support decision making	SH
28	Describes evidence used in developing, implementing, evaluating and improving policies, programs and services	KH
29	Describes the laws, regulations, policies and procedures for the ethical conduct of research (e.g., patient confidentiality, protection of human subjects)	K
30	Describes the local, state and federal public health and health care systems	K
31	Describes the organizational structures, functions and authorities of local, state and federal public health agencies	K
32	Adheres to the organization's policies and procedures	D
33	Participates in the development of a programmatic budget	D

S.N.	Competency	Miller's Competency Level
34	Describes financial analysis methods used in making decisions about policies, programs and services (e.g., cost-effectiveness, cost-benefit, cost-utility analysis, return on investment)	KH
35	Uses evaluation results to improve program and organizational performance	KH
36	Incorporates ethical standards of practice (e.g., Public Health Code of Ethics) into all interactions with individuals, organizations and communities	SH
37	Describes public health as part of a larger inter-related system of organization that influence the health of populations at local, national and global levels	KH
38	Contribute to development of a vision for a healthy community (e.g., emphasis on prevention, health equity for all, excellence and innovation)	KH
39	Assess and recommend health promoting behaviors	D
40	Perform Data management using softwares (Excel, SPSS, Stata, Epi-info)	D
41	Conduct health research (Interview, FGD, In-depth interview, KII, data presentation and recommendation)	SH
42	Food quality inspection and recommendation	SH

## 2.8 Bachelor of Physiotherapy (BPT)

### 2.8.1 Introduction

Physiotherapy is the health profession integral to all health across the lifespan that promotes the well-being of an individual through health promotion, prevention, habilitation and rehabilitation that encompasses physical, psychological, emotional, social and environmental factors. Physiotherapy provides services to individuals and the community where mobility and functioning are or may be threatened due to injury, pain, illness, dysfunction or environmental factors. Further, physiotherapy promotes the active participation of individuals in the community, through the development, maintenance and restoration of their physical and functional ability.

Physiotherapy is based on physiotherapy science and it applies to research and knowledge from many other fields (e.g., medical science, health sciences, physical education, social and behavioral sciences). The art and science of physiotherapy are used in the treatment

of patients with the disease, disability or injury and aim to achieve and maintain optimal functional capacity. Physiotherapists need to understand human functional abilities and limitations. For that anatomy, physiology, microbiology, biochemistry, pharmacology, pathology, pathophysiology, motor learning, motor control and biomechanics/kinesiology create the core of the physiotherapist's knowledge base for gaining further physiotherapy knowledge and skill in different fields such as musculoskeletal physiotherapy, neurological physiotherapy, cardiopulmonary physiotherapy, paediatric physiotherapy, geriatric physiotherapy, community based physiotherapy and physiotherapy in women's and men's health. In addition, a physiotherapist requires information on factors influencing how the client/patient will benefit from his/her guidance and assistance, as well as an awareness of the possibilities of technology, while considering environmental and social issues.

The first formal physiotherapy education program in Nepal was established in 1983 within the Institute of Medicine at Tribhuvan University in Kathmandu as a 3-year physiotherapy certificate program. This course ran until 1990. From 2003-2009, a 3-year physiotherapy certificate program commenced at Dhulikhel Medical Institute (DMI) on the campus of Kathmandu University at Dhulikhel. This was upgraded to the Bachelor of Physiotherapy (BPT) education (4 and ½ years) in 2010 for the first time in Nepal. Since then, many colleges have come up in and around the valley. As per the data of the Nepal Health Professional Council (NHPC), the physiotherapist: patient ratio seems to be low in Nepal. This indicates an acute shortage of well-trained physiotherapists in Nepal. To improve the health outcomes of any community, it is important that physiotherapists have the best available education and training to work in health care teams to improve health outcomes across the country.

The goal of physiotherapy education is to prepare a well-trained health care professional within the country to meet our demand for qualified physiotherapy services. The graduates will have the ability to solve problems and make decisions, have good communication skills and have an in-depth knowledge of the science and practice of physiotherapy, enabling them to practice safely, effectively and efficiently in a variety of clinical and community settings. Their practice will be client/patient-centered and evidence-based. Also, the goal of physiotherapist education is to ensure the continuing development of physiotherapists who are competent and entitled to practice the profession, without limitation and in accordance with the definition of physiotherapist practice as stated in World Physiotherapy's policy statement.

### **2.8.2 Programme Objectives**

On completion of the BPT program, the graduates will be able to:

1. Practice autonomously
2. Provide effective skill in patient oriented care and in physiotherapy patient management
3. Demonstrate the knowledge, skills, abilities and professional behaviour required for an independent and competent physical therapy practice.
4. Analyze and make a sound clinical decision for evidence-base patient management
  - a. Retrieve, critically analyse and use evidence that underpins physiotherapy practice
  - b. Utilize scientific literature for clinical decision making
  - c. Utilize current evidence for patient management
5. Demonstrate ability to communicate effectively and appropriately
  - a. Demonstrate excellent oral and written communication skills.
  - b. Communicate effectively with clients, their families, care takers, clinical supervisors, other health professionals and relevant individuals
6. Contribute to the global health management and health promotion in the community
  - a. Possess awareness on a global health perspective
  - b. Assess, analyse and implement the needs of the community
  - c. Develop plans for disease prevention and wellness for a community
7. Demonstrate a strong ethical and moral framework in clinical practice
  - a. Should be culturally sensitive and competent.
  - b. Should be consistent with professional responsibilities, which will include accountability, reliability, self-awareness of own limits and abilities
8. Demonstrate ability to work in different health care settings
  - a. Have a capacity to work in teams spanning different health professions, valuing the roles and responsibilities of other team members.
  - b. Practice in a diverse range of health care settings
9. Demonstrate research skills, leadership and management skills in physiotherapy and related health care contexts.
10. Reflect on their practice and be a lifelong learner.

### **2.8.3 Areas of Learning**

1. Pre-clinical sciences subjects: Anatomy, physiology, pathology, microbiology, biochemistry and pharmacology
2. Foundational physiotherapy subjects: Evidence-based physiotherapy practice, Biomechanics/kinesiology, sociology, psychology, physiotherapeutic exercise
3. Musculoskeletal Physiotherapy, Neurological Physiotherapy, Cardiopulmonary Physiotherapy, Pediatric Physiotherapy, Women's and Men's Health, Community

Based Physiotherapy, Health Promotion, Physiotherapy in Mental Health, Research Methodology, Biostatistics.

### 2.8.4 Core Competencies

Physiotherapists should be competent to practice safely and effectively in a range of contexts and situations of varying levels of complexity. Physiotherapists are expected to have acquired the competency domains of core physiotherapy practice by the time of their graduation. Providers of physiotherapist entry-level education programs must ensure that their graduates are competent to:

1. Clinical competency (Physiotherapy assessment and intervention)
2. Ethical and professional practice and quality improvement
3. Communication, leadership and management.
4. Evidence-based practice
5. Reflective practice and lifelong learning

#### List of competencies for Basic Medical Sciences subjects:

S.N.	Laboratory Based Competency	Miller's Competency Level
1	Identify individual human bones	KH
2	Identify the origin, insertion, course and action of individual muscles	KH
3	Identify human body sections and organs	KH
4	Use light microscope properly and identify basic and system related histological slides	KH
5	Identify important anatomical landmarks necessary for clinical applications	K
6	Read normal X-ray plates and differentiate between plain and contrast X-rays	SH
7	Perform Surface marking of heart for Apex, base and position of bicuspid, tricuspid valve	SH
8	Perform Surface marking of lungs	SH
9	Perform surface marking of median cubital vein and insertion of needle in cadavers	SH
10	Locate Mc Burney's point, deep and superficial inguinal ring, saphenous opening, surface marking of inguinal canal	SH
11	Explore femoral triangle to identify femoral nerve, artery and femoral vein	SH



S.N.	Laboratory Based Competency	Miller's Competency Level
12	Explore/ dissect knee joint to identify medial and lateral collateral ligament, menisci and intracapsular ligaments and functions of meniscus and ligament (ACL, PCL and collateral ligaments)	SH
13	Trace the peritoneal lining around abdominal viscera and pelvic region with their modification and functions of peritoneum	SH
14	Dissect axilla and identify the brachial plexus (root, trunk, division and branches)	SH
15	Be able to identify the side of kidney, testis and lungs	K
16	Demonstrate long bones with its side in anatomical position (femur, tibia, fibula, hip bone, humerus, radius, ulna and scapula, typical and atypical ribs)	SH
17	Measure Blood Pressure	SH
18	Skill for pulse recording and interpretation of types of pulse	SH
19	Perform clinical examination of respiratory system in sequence	SH
20	Calculate and interpret respiratory dead space and ventilation/perfusion ratio	SH
21	Record and read lung volumes and capacities( spirogram/ spirometry)	SH
22	Identify bronchial and vesicular breath sounds and Elicit vocal fremitus and vocal resonance	KH
23	Auscultate for heart sounds and correlate with cardiac cycle	SH
24	Perform and Interpret normal and abnormal ECG	SH
25	Calculate and interpret cardiac output	SH
26	Performs cardio respiratory resuscitation in a sequence of ABC management in a dummy	SH
27	Perform per abdominal physical examination	SH
28	Perform Perimetry and identify size of blind spot	SH
29	Test monosynaptic and polysynaptic reflexes	SH
30	Perform sympathetic and parasympathetic nervous system stimulation tests	SH
31	Examine motor and sensory functions of nervous system and test superficial and deep reflexes for spinal cord functions and related neural pathways	SH

S.N.	Laboratory Based Competency	Miller's Competency Level
32	Perform clinical examination of 12 pairs of cranial nerves in human subjects	SH
33	Prescribe and interpret different biochemical tests e.g., renal function test, cardiac function test, liver function tests, lipid profile, thyroid function, hormone analysis and tumor markers etc.	SH
34	Identify common bacterial and fungal growth in culture medium by the use of basic microbiological techniques e.g., use of selective media, colony characteristics, culture condition, biochemical tests and microscopy	KH
35	Identify common blood and intestinal parasites with the help of simple laboratory procedure e.g., staining and microscopy	KH
36	Prescribe and interpret microbiological tests for the diagnosis of infectious diseases	SH
37	Correlate normal and altered morphology (gross and microscopic) of different organ systems in common diseases to the extent needed for understanding of disease processes and their clinical significance	KH
38	Draw a rational scheme of investigations aimed at diagnosing and managing the cases of common disorders	SH
39	Identify the importance of rational use of medicine and process of rational prescribing in health care	KH
40	Understand the chemical aspects of different biological processes such as digestion, respiration, reproduction, excretion, the behavior of hormones, contraction and relaxation of muscles	K
41	Understanding the effects of the medications, side effects, potential drug interactions and how these will influence ideal physiotherapy management	K

S.N.	Clinical Competency	Miller's Competency Level
1	Apply the basic concepts of normal and abnormal biomechanics/ kinesiology in analyzing fundamental movements of human body	KH
2	Observe and assess the normal and abnormal posture, gait and its control mechanics	KH

S.N.	Clinical Competency	Miller's Competency Level
3	Perform Subjective, Objective, Assessment, Plan (SOAP) documentation in patient assessment, provide PT diagnosis and use the framework of the International Classification of Functioning, Disability and Health (ICF)	D
4	Evaluate the normal and abnormal findings from the patient/client assessment	D
5	Identify common outcome measures uses in assessment	KH
6	Perform the following skills: <ul style="list-style-type: none"> <li>• therapeutic exercise</li> <li>• functional training</li> </ul>	D
7	Prescribe devices and equipment (assistive, adaptive, orthotic, protective, supportive and prosthetic)	D
8	Apply the theories and concept of pain in physiotherapy pain management	SH
9	Assess pain using outcome measures and perform techniques of physiotherapy in pain management	D
10	Apply the concepts of currents, electrodes and its therapeutic and physiological effects using clinical reasoning to prescribe modalities in pain conditions (e.g., heat, cold, ultrasound, IFT, TENS, stimulator, NEMS, ECSWT)	K
11	Use of electrotherapy modalities for pain management	D
12	Perform exercise training applying the concepts of physiological response of exercise on body structure and function and its adaptations to aerobic and anaerobic system in cardiovascular and respiratory systems	D
13	Prescribe and perform the exercise training in different environments	D
14	Correlate the pathophysiology and its consequences in musculoskeletal conditions	KH
15	Perform physiotherapy musculoskeletal assessment and evaluate the findings from the assessment to identify and prioritize problems and set functional outcomes goals for musculoskeletal conditions	D
16	Use biopsychosocial and environmental aspects in patient assessment and management	SH

S.N.	Clinical Competency	Miller's Competency Level
17	Screen for differential diagnosis and formulate a diagnosis to determine the prognosis and most appropriate, evidence-based intervention/education strategies by using clinical reasoning	SH
18	Prescribe and perform therapeutic exercises, functional training, devise/educate the use of assistive devices and apply electrotherapy modalities in musculoskeletal conditions	D
19	Perform manual therapy techniques and provide education and self-management strategies to patient/client with musculoskeletal disorders	D
20	Evaluate the outcomes of intervention using valid and reliable measures in musculoskeletal conditions	D
21	Identify and interpret the normal and abnormal investigations. e.g., radiographs, CT, MRI	KH
22	Comprehend, assess and apply evidence-based treatment approach with respect to different pre and post-operative cases according to ICF model	D
23	Differentiate types of sports injuries and demonstrate the physiotherapy management that includes pain management, flexibility and joint ROM, strength, endurance, proprioception, coordination, functional rehabilitation and emergency care	D
24	Evaluate and formulate the health and skill related components of physical fitness testing	D
25	Correlate the pathophysiology and its consequences in neurological conditions	KH
26	Perform history taking and physical examination to generate appropriate hypothesis, diagnosis and prognosis skills to deliver effective and appropriate treatment program for clients with neurological deficits	D
27	Formulate a differential diagnosis based on lesion location, time course and relevant historical and demographic features	KH
28	Interpret findings from range of outcome tools used for assessment of each domains of neurological examination	KH
29	Apply the basic principles of motor control, motor learning, neuroplasticity and biofeedback in the physiotherapy management for patients with neurological problem	D

S.N.	Clinical Competency	Miller's Competency Level
30	Demonstrate competency in selecting, performing, evaluating and perform the common therapeutic interventions aimed at minimizing impairment, activity limitations and participation restrictions using evidence based practice	D
31	Demonstrate competency in evaluating the principles of various neurological approaches and its application in rehabilitation	SH
32	Illustrate the application of ICF framework to neurological conditions and roles of physiotherapists within this model	D
33	Analyze problem list and develop goals, formulate physiotherapy interventions and perform treatment for patients with various neurological conditions	D
34	Perform pre-operative and post-operative assessment and management in patients undergoing / undergone neurosurgery	D
35	Identify different types of neurogenic bladder and manage patients with bladder dysfunction	D
36	Correlate the pathophysiology and its consequences in cardiopulmonary conditions	K
37	Apply the concepts of biomechanics, normal and abnormal physiology of various pulmonary and cardiac disorders	KH
38	Perform cardiopulmonary assessment (history taking, physical examination, differential diagnosis, diagnosis, problem list, goal-setting (e.g., ICF based)	D
39	Identify the principles used to perform/determine/evaluate the different outcome measures in cardiopulmonary conditions e.g., arterial blood gases, pulmonary function testing, endurance (Stress) testing, chest radiograph etc.	KH
40	Perform different techniques: lung expansion, postural drainage, training/retraining of respiratory muscles, pacing in patient with cardiopulmonary conditions	D
41	Evaluate evidence based management, apply clinical reasoning, formulate physiotherapy treatment plan and perform physiotherapy management for different cardiopulmonary conditions including medical and surgical conditions	D

S.N.	Clinical Competency	Miller's Competency Level
42	Prescribe exercise in cardiopulmonary conditions according to ACSM/ WHO guidelines	D
43	Identify key features in the ICU setting including equipment	KH
44	Perform physiotherapeutic techniques in ICU settings based on sound clinical reasoning	D
45	Perform pulmonary and cardiac rehabilitation	D
46	Perform CPR in emergency situation	D
47	Perform physiotherapy women and men's health assessment and evaluate the findings from the assessment to identify and	D
	prioritize problems and set functional and clinical outcomes goals for musculoskeletal conditions	
48	Screen for differential diagnosis and formulate a diagnosis to determine the prognosis and provide evidence-based intervention/education strategies by using clinical reasoning	D
49	Perform physiotherapy interventions, therapeutic exercise e.g., pelvic floor muscle training <ul style="list-style-type: none"> <li>• Antenatal, natal and postnatal exercises</li> <li>• Functional training</li> <li>• Manual therapy techniques</li> <li>• Education</li> <li>• Physical agents</li> </ul>	D
50	Evaluate the outcomes of intervention using valid and reliable measures	KH
51	Perform pre and post physiotherapy treatment with respect to the gynecological surgeries	D
52	Provide physiotherapy management for the psychosocial aspect of the women's health	D
53	Apply the concept of theories of aging, the physiological changes and its effects in the physiotherapy management for geriatric population	K
54	Assess, evaluate, diagnose, prescribe and perform evidence-based exercises/protocols to improve pain, fall, balance, gait, ambulation, fatigue, endurance and functional level of an older person	D

S.N.	Clinical Competency	Miller's Competency Level
55	Perform basic psychosocial rehabilitation for an older person	D
56	Apply bio-psychosocial model in describing impairment, disability and handicap	KH
57	Identify disability and its types; identify its causes and levels of prevention in various contexts	KH
58	Describe the National and International policies, facts and figures, legislation and disability-related resources and the SDGs	K
59	Identify the components of the CBR matrix and indicators and strategize various methodologies in sustaining a CBR program in Nepal	KH
60	Design, prescribe and make basic aids and assistive devices according to need analysis using local resources for various groups and conditions.	D
61	Identify architectural barriers and methods of designing a barrier free environment	KH
62	Describe the importance of social work and Vocational rehabilitation at community level	K
63	Design and conduct various awareness and education programs at community level	D
64	Identify occupational hazard, evaluate work place and work of sedentary table workers	KH
65	Design a workplace, prescribe education on occupational safety and health and provide basic intervention on ergonomics and exercises	D
66	Participate in preparedness, response and recovery phase of disaster management within physiotherapeutic scope	KH
67	Assess, identify and prescribe an appropriate wheelchair to a client	SH
68	Apply the concept of health, identify Global/Nepal burden of disease, its situation, policies and national health care system to identify the healthcare needs of the population in different context	KH

S.N.	Clinical Competency	Miller's Competency Level
69	Design, develop physiotherapy programs and perform physiotherapy management to prevent and manage disease and disability using different methods of health promotion	D
70	Assess, screen chronic disease, prescribe exercise and provide evidence based treatment for managing the chronic health disease and its co-morbidities	D
71	Assess, analyze and design the appropriate physiotherapy management for various psychiatric disorders using clinical reasoning and evidence based practice	D
72	Classify pediatric age group and list different equipment used in pediatric physiotherapy	KH
73	Analyze the children for developmental progression and analyze movement of typical and atypical children 0-5 years	D
74	Assess pediatric population using interview and physical examination including developmental assessment	D
75	Describe family centered practice approach and role of family in pediatric rehabilitation	KH
76	Describe early intervention and recognize its criteria and benefits	KH
77	Set goals based on COPM, SMART and GAS Goal for children	D
78	Perform positioning and handling techniques in neonates and pediatric conditions and formulate exercise prescription and home program for different pediatric conditions	D
79	Describe the role of Physiotherapy in NICU and PICU	KH
80	Identify the early detection methods of high risk infants and describe intervention for them	KH
81	Perform different skill and approaches used in pediatric physiotherapy intervention	D
82	Describe the assessment and physiotherapy intervention appropriate for children with neurological, orthopedic, muscular, neuromuscular, cardiovascular and respiratory conditions as listed in the content	D
83	Assess and evaluate calming and arousal therapy for children with behavioral and learning problems	D



S.N.	Clinical Competency	Miller's Competency Level
84	Assess and perform physiotherapy intervention in medical condition such as obesity, diabetes mellitus, burns and mental health problems	D
85	Perform physiotherapy management in palliative care	D

S.N.	Research competency	Miller's Competency Level
1	Explain key components of research design and statistical analysis including observational studies, clinical trials and survey studies	K
2	Analyze and interpret the measurement of the data with respect to different variables, a measure of central tendency and probability distribution, its application and demonstrate through tables, graphs	D
3	Use statistical software to apply statistical methods and techniques	D
4	Apply the concept of research ethics, informed consent and plagiarism in research	KH
5	Develop a research proposal for ethical approval, grant application and a manuscript	SH

S.N.	Community and soft skills based competency/ Fundamental competencies	Miller's Competency Level
1	Demonstrate ethical, professional and evidence based practice for entire clinical encounter	SH
2	Demonstrate quality improvement, reflective practice and lifelong learning in clinical practice	SH
3	Apply appropriate communication skills to interact with patients and their families and supporting staff	S
4	Exchange information, professional knowledge and experience with professional colleagues	KH
5	Work constructively in a team/ group and cooperate with other colleagues and professionals	SH
6	Identify competencies, scope and practices in physiotherapy and its governing bodies (national and international)	K

S.N.	Community and soft skills based competency/ Fundamental competencies	Miller's Competency Level
7	Identify models of health care, roles and responsibilities of rehabilitation team	K
8	Understand and apply leadership and management skills as and when required	SH
9	Understand and respect the roles and expertise of health and social care professionals in the context of working and learning as a multi-professional team	KH
10	Apply psychosocial and behavioral principles in patient centered health care	KH
11	Apply appropriate ethical and legal standards in providing patient centered care in accordance with health care rules and regulations of Nepal	KH
12	Practice in accordance with professional ethics and code of conduct	S
13	Recognize the importance of maintaining professional growth and life-long learning	K
14	Apply and demonstrate practice management skills and quality assurance principles	KH
15	Maintain and utilize patients records. Recognize and practice new concepts and modalities of health care delivery	KH
16	Asses the scientific evidence published in professional journals and integrate scientific research with for optimum evidence-based care	KH
17	Understand the opportunities for improving health beyond his/her practice through participation and outreach and community based clinical and health promotion educational activities	K

## 2.9 Bachelor in Pharmacy (B. Pharmacy)

### 2.9.1 Introduction

According to WHO, the pharmacist is defined as “A person prepared to formulate, dispense and provide clinical information on drugs or medications to health professionals and patients”. As an essential member of the healthcare team, the pharmacist plays an vital role in maintaining the quality of health care and pharmaceutical care. The pharmacist must be expert in medicines and should have enough clinical expertise in addition to

formulation, quality control and practical knowledge, to ensure the safe supply and rational use of medicines by the public. This requires competency in assuring the quality of pharmaceutical products supplied to patients, taking into consideration the policies and regulation of the government. The pharmacist must be competent enough to counsel patients and community about safe use and misuse of drugs.

Recently, significant development in pharmacy practice extended the scope to patient centered care that includes patient counseling service, drug information service and drug therapy monitoring; in addition to other technical aspects of pharmaceutical services that ensure maintenance of the supply and use of high quality medicines. The WHO has accordingly developed the concept of “Seven-Star Pharmacist” which defines the role of pharmacist in healthcare team as “Caregiver, decision-maker, communicator, manager, life-long learner, teacher and leader”.

Pharmacist for community pharmacy used to develop by Department of Drug Administration (DDA) by conducting short term training. Intermediate in Pharmacy was started by Institute of Medicine (IoM) in 1972 but Nepalese had to go abroad for university level education in Pharmacy until Kathmandu University, School of Science launched Bachelor in Pharmacy (BPharm) in 1994, After that Pokhara, Tribhuvan and Purbanchal Universities and Karnali Academy of health sciences (KAHS) also started university level education in Pharmacy. To regulate Pharmacy education in Nepal, government of Nepal established Nepal Pharmacy council in 2001. Though the council was the governing body for monitoring pharmacy education, the council did not document competencies required in pharmacists produced in Nepal Thus, Universities developed the curriculum on their own way which were not competencies driven. Though the licence for practice is issued by the council based on written exam. Though the knowledge is tested during the exam, skill, attitude and behaviours are ignored to issue the licence which are very important to produce competent workforce that will work as per need of local, regional, national and international. Now Medical Education Commission has taken initiation to develop national competencies of medical education. This will sensitize university to develop curriculum to cater competencies to the pharmacy workforce in the future.

Undergraduate course in pharmacy is offered by four universities (Kathmandu, Tribhuvan, Pokhara and Purbanchal) and Karnali academy of health sciences (KAHS). There are few things common such as name of degree and duration and intake criteria but there are a lot of variations among the curriculum with in Nepal such as yearly system and semester system, subjects' selections during curriculum development were not based on competencies required in the work force. The objective of this framework is to harmonize the curriculum by narrowing down the variations among institutions with in Nepal without hampering freedom of universities on common consensus basis.

### **2.9.2 Programme Objectives**

The general objective of the course is to produce competent Pharmacy workforce as per need of local, national and international level.

The specific objectives are as follows:

1. Maintain professional dignity and respect
2. Demonstrate broad understanding of the scientific basis of the specialty of pharmacy
3. Integrate and apply the skill and knowledge in practice creatively as per requirement in various pharmacy related areas confidently
4. Appraise critically the national legislation on drug and related fields, National Health Policy and National Drug Policy and other regulations related to pharmacy in the context of total health care system of Nepal
5. Show the leadership for collaborative research projects
6. Recognize and promote alternative perspectives in the effective utilization of natural resources available within the country
7. Demonstrate competence in searching, handling and integrating information and applying knowledge, skills and attitudes in professional problem solving.

### **2.9.3 Areas of Learning**

#### **Basic subjects**

1. Calculus and Algebra
2. General Physics
3. General Chemistry
4. Information Systems Technology
5. Professional Communication
6. Statistics and Probability
7. Calculus and Algebra
8. General Physics
9. General Chemistry
10. Information Systems Technology
11. Professional Communication
12. Statistics and Probability
13. General Cell Biology
14. Reaction Mechanism and Stereo Chemistry
15. Computer Programming with PYTHON
16. Organic Chemistry
17. Quantitative Analysis
18. Instrumental Analysis

19. Business Management
20. Entrepreneurship Development
21. Biostatistics
22. Research Methodology

### **Professional and Elective Courses**

1. Foundation Course in Pharmacy
2. Pharmaceutical Microbiology and Immunology
3. Physiology and Pathophysiology
4. Pharmacognosy
5. Inorganic Pharmaceutical Chemistry
6. Pharmacology and Toxicology
7. Biopharmaceutics and Pharmacokinetics
8. Medicinal Chemistry
9. Medical Biochemistry
10. Physical Pharmacy
11. Pharmacotherapeutics
12. Pharmacoeconomics
13. Pharmacy Practice
14. Pharmaceutical Biotechnology
15. Hospital Pharmacy
16. Research Methodology
17. Clinical Pharmacy
18. Industrial Pharmacy (Dosage forms and Formulations/Pharmaceutics)
19. Social and Forensic Pharmacy
20. Pharmaceutical Care
21. Cosmetology
22. Chronopharmaceutics
23. Complementary Medicines
24. Pharmaceutical Engineering
25. Neutraceuticals
26. Pharmaceutical nanotechnology
27. Procurement and Supply Chain Management
28. Herbal Drug Technology
29. Pharmaceutical Chemistry
30. Pharmaceutical Analysis and Quality Assurance
31. Forensic Pharmacy/Pharmaceutical Jurisprudence
32. Community Pharmacy
33. Pharmaceutical Management

### **2.9.4 Core Competencies**

After completion of the course, graduates will have following core competencies:

1. Demonstrate handling, dispensing, procurement, drug storage, formulation and small/large scale production.
2. Maintain professional ethics and code of conduct
3. Communicate effectively with different healthcare professionals and stakeholders
4. Demonstrate professional competence to work as member of the multiprofessional health care team
5. Counsel the patients
6. Maintain Interpersonal Relationship Skill with Patients, Doctors, Nurses and other healthcare professionals.
7. Perform as a team member of health workers in clinical setting.
8. Evaluate drug-interaction and avoid drug incompatibility.
9. Provide drug and poison information to the doctors, health personnel and users.
10. Manage the hospital pharmacy.
11. Provide over-the-counter (OTC) drugs rationally to the community and generate awareness.
12. Monitor the implementation of National Drug Policy and drug regulations.
13. Plan, manage and evaluate retail and wholesale pharmacies and drug industries.
14. Demonstrate the ability to conduct further studies and research work on different pharmaceutical fields.
15. Perform as a teacher in educational institutions.
16. Perform drug quality assessment using different methods.
17. Monitor and evaluate quality assurance system serving as GMP superintendent in drug industry.
18. Inspect the drug manufacturing plant, storage conditions, drug handling, drug distribution, use and record keeping.
19. Perform in an industry as a production manager, marketing manager or quality control manager.
20. Perform on the capacity of Good Manufacturing Practitioner and as advocator of WHO/GMP.
21. Demonstrate the promotion of 'Certificate of Pharmaceutical Products' moving in the international commerce.

### 2.9.5 Skill Competencies

S.N.	Competency	Miller's Competency Level
1	Demonstrate knowledge on legal and regulatory science and practices along with pharmaceutical supply chain	SH
2	Demonstrate awareness of local/international code of ethics of pharmacists	SH
3	Take responsibility of own action and patients' care	D
4	Ensure confidentiality with patients and other healthcare professionals	D
5	Obtain patients' consent	D
6	Recognize own professional limitations	SH
7	Communicate clearly, precisely and appropriately	SH
8	Communicate effectively with healthcare team members, patients' party	SH
9	Tailor communication to patients' need	SH
10	Use appropriate communication skill to build rapport, engage patients	SH
11	Demonstrate collaboration with other healthcare team members	KH
12	Demonstrate conflict management skills where necessary	KH
13	Become flexible and decated to work and work place	KH
14	Ability to accurately weigh and measure ingredients	D
15	Ability to demonstrate preparation techniques and use of equipment (e.g., grinding, mixing, blending, balances and calibrated measures)	SH
16	Ability to demonstrate a systematic technique for making a variety of pharmaceutical products (e.g., creams, emulsions, solutions)	SH
17	Ability to demonstrate technique and personal hygiene measures that limit the opportunities for contamination of the product	SH
18	Ability to describe the function of a cleanroom, including pressure differentials, airflow, use of High Efficiency Particulate Air (HEPA) filters and placement of cabinet and other equipment	SH

S.N.	Competency	Miller's Competency Level
19	Ability to describe the basis for use of aseptic dispensing technique in a horizontal laminar air-flow cabinet in a cleanroom	SH
20	Ability to differentiate and describe products that require aseptic dispensing to ensure sterility (e.g., TPN, narcotic and antibiotic infusions and injections).	SH
21	Understands the issues important to the selection of correct equipment for aseptically prepared products	KH
22	Ability to describe the key features of a quality assurance program	KH
23	Develop selection criteria of medicines in hospital formulary	D
24	Develop efficient inventory management system	D
25	Advise health care providers and clients on issues related to pharmaceutical products and its quality standards	KH
26	Ability to access the consumer's hard copy medication record and/or notes	KH
27	Ability to understand medical terminology and medical abbreviations	KH
28	Ability to describe the use and limitations of laboratory tests and investigations (e.g., renal function and microbiological sensitivity tests) that are likely to impact on medication treatment	KH
29	Appropriately select medicines, Dispense devices	D
30	Advise patients on proper storage conditions of the medicines and ensure that medicines are stored appropriately (e.g., humidity, temperature, expiry date, etc.)	D
31	Appropriately refer patients based on severity	KH
32	Document and act upon dispensing errors	D
33	Identify sources, search information systematically, evaluate and provide evidence based medicine information appropriate for the needs of patients	SH
34	Counsel patients on rational use of medicines	D
35	Understand process and assessment for quality and safety, including pharmacoconomics	KH



S.N.	Competency	Miller's Competency Level
36	Demonstrate knowledge on healthcare system policies, financing, information system, work forces, service delivery and access to essential medicines and health technologies	KH
37	Identify and resolve risk management issues to improve quality and safety of medicine use and services	KH
38	Appropriately select medicines formulation and concentration for minor ailments (Out of hospital)	SH
39	Initiate activities for promoting health, preventing disease and prolonging life	KH
40	Access and support local and national health priorities and initiatives	KH
41	Initiate and implement programs and interventions to promote healthy life styles, disease prevention or consumer protection	KH
42	Educate population to access and understand health information on selection and rational use of medicines, herbal medicines and health products	KH
43	Provide training for community staffs and leaders	D
44	Continuous self -development	SH
45	Demonstrate caring and service mind	SH
46	Demonstrate flexibility and adaptability in uncertain situation	SH
47	Communicate clearly, precisely and appropriately	SH
48	Demonstrate cultural awareness and sensitivity	SH
49	Apply assertiveness skills	SH
50	Demonstrate leadership and practice management skills	SH
51	Prioritise work and implement innovative ideas	KH
52	Engage with students/interns/ residents	SH
53	Demonstrate knowledge in marketing and sales	SH
54	Comply with legislation for drugs with the potential for abuse	SH
55	Be aware of and identify the new medicines coming to the market	KH

S.N.	Competency	Miller's Competency Level
56	Apply and understand regulatory affairs and the key aspects of pharmaceutical registration and legislation	KH
57	Ensure punctuality	SH
58	Develop and implement SoPs	SH

## 2.10 Bachelor of Science in Medical Imaging Technology (B.Sc. MIT)

### 2.10.1 Introduction

Medical imaging is an indispensable component of modern medical science and practice. It is uncommon to diagnose or treat a pathological condition without taking advantage of medical imaging technology because of the incredible level of anatomical, pathological and functional details revealed by images of different imaging modalities. The varying intrinsic properties of human biological tissues changing structurally and functionally caused by disease or disability can be diagnosed easily and accurately permitting prompt delineation and characterization of the disease or disability. Medical imaging technology has also created a virtual window into the body, fostering a better scientific comprehension of its mysteries, enabling the investigation of underlying causes of medical symptoms through diagnostic processes and aiding in disease treatment through interventional radiology with proper targeting and monitoring where surgery is not mandatory.

The development of newer imaging technology has fuelled dramatic change in modern medical practice. Nepal still lacks a competent, well-trained, motivated and committed Medical Imaging Technologist. Large numbers of qualified Medical Imaging Technologists are required to assist in quality radiological services and to operate various newer imaging equipments.

To start with the education in medical imaging technology, Institute of Medicine (IOM-TU) is considered as the pioneer in the field of Medical Imaging education. IOM started its Proficiency Certificate Level (PCL) radiography course in 1973 AD, which was discontinued from 2011 AD as per the policy of TU to phase out certificate level courses from colleges and also due to the reason that PCL courses are now run by schools affiliated to CTEVT.

Due to the need of more qualified health professionals in this field, IOM has started a combined B.Sc. in Radiological Technology (B.Sc. RT) course comprising both Radio-diagnosis and Radiotherapy in the year 2000 AD. The same course (B.Sc. RT) was named B.Sc. in Medical Imaging Technology (B.Sc. MIT) in 2008 AD as a 3 academic year study program in Radio-diagnostic imaging technology discarding the radiotherapy

portion from the curriculum of IOM, but due to the policy of T.U. and the international trend and requirements this course has been made a 4 academic year course in 2011 AD. Similarly, other institution such as BPKIHS has also started B. Sc. MIT program in 2001 AD NAMS also started B.Sc. MIT program in 2012 AD Similarly, KUSMS also started Semester based Four Years (Eight Semester) B.Sc. MIT program for the first time in Nepal in 2019 AD.

Medical Imaging Technology is absolutely vital to nation's health and still there is lack of qualified imaging technologists. Since, Nepal government is funding huge number of budgets in health sector to purchase advanced and latest Medical Imaging, Nuclear Medicine and Radiotherapy equipment's, a large number of qualified, competent and skilled manpower will be required to operate these equipments. B.Sc. MIT programme aims to produce qualified medical imaging professional's known as Radio Technologist to operate new and expensive imaging equipments in government as well as private institutions.

### ***2.10.2 Programme Objectives***

The main objective of this course is to produce a medical imaging technologist who will be able to:

1. Recognize the importance of professionalism and ethical behavior.
2. Demonstrate skills and understanding of the necessity of cooperation across professional boundaries and build their professional practice on respect and a sense of equality.
3. Perform all routine and special X-ray examinations.
4. Perform all routine CT and MRI examinations.
5. Perform Basic Life Support procedures.
6. Demonstrate technical knowledge and skills on interventional radiology.
7. Maintain the highest quality of radiographic images.
8. Provide adequate care to the patient in the department of radiology.
9. Demonstrate sound knowledge on radiation protection in the department of Radio-diagnosis.
10. Demonstrate basic knowledge of Radiotherapy and nuclear medicine procedures.
11. Demonstrate sound knowledge on recent advances in radiology and newer imaging modalities in Radio-diagnosis.
12. Maintain X-ray equipment and accessories in good working order and be able to notify authority of any breakdown or replacement needed.
13. Keep professionally updated, acquire new knowledge and evaluate new equipment as well as taking part in professional development work.
14. Demonstrate necessary competence in matters of planning a Radiology Department

and purchasing new equipments.

15. Self-Competent for National (Nepal Health Professional Council) and International radiography license registry, Post graduate entrance and Public Service Commission (PSC) examination.
16. Demonstrate a sense of responsibility, ethical behavior and independence as a learner and as a scientist.

### ***2.10.3 Areas of Learning***

1. Medical Ethics and Law
2. Human Anatomy
3. Human Physiology
4. Health Care Management
5. Basic Radiation Physics
6. Conventional Radiological Imaging Equipment
7. Basic Integrated Health Sciences (Pathology, Pharmacology, Biochemistry, Microbiology)
8. Radiological Information and Communication Technology
9. Radiographic Imaging and Exposure Techniques
10. Clinical Radiographic Positioning and Imaging Technique
11. Special Radiological Procedure and Interventional Technique
12. Hospital Practice and Patient Care in Radiology
13. Physics and Equipment for Modern Imaging Technology
14. General Radiographic and Cross Sectional Anatomy
15. Cross-sectional Imaging Technique
16. Ultrasound Imaging Technology
17. Radiotherapy, Nuclear Medicine and Molecular Imaging Technology
18. Basic Radiological Engineering Technology
19. Quality Assurance and Quality Control in Diagnostic Radiology
20. Biostatistics and Research Methodology

### ***2.10.4 Core Competencies***

1. Professionalism and Ethical Practice
2. Communication and collaboration
3. Evidence based learning
4. Safety of practice and risk management
5. Professionalism (Radiography Skills and Attitudes)
6. Leadership and Management
7. Researcher and life-long learner

S.N.	Competency Domain : Professionalism and Ethical practice	Miller's Competency Level
1	Apply knowledge of legal responsibilities	K
2	Manage personal, mental and physical health to ensure fitness to practice	SH
3	Apply knowledge of mandatory and voluntary reporting obligations	K
4	Provide relevant information to the patient and apply knowledge of appropriate methods to obtain informed consent	SH
5	Apply knowledge of the basic principles underpinning ethical practice within the medical imaging	K
6	Apply knowledge of appropriate levels of autonomy and professional judgement in a variety of medical imaging	K
7	Apply knowledge of the influence of socio-cultural factors on patient attitudes and responses to medical imaging/ radiation therapy services	K
8	Apply knowledge of appropriate professional behavior in patient interactions	K
9	Apply knowledge of organizational policies and guidelines with professional standards within their scope of practice	K
10	Apply knowledge of relevant quality systems appropriate to their scope of practice	K

S.N.	Competency domain: Communication and Collaboration	Miller's Competency Level
1	Apply knowledge of ways to establish rapport with the patient to gain understanding of their issues and perspectives	KH
2	Apply knowledge of ways to communicate with the patient and/or visitors to collect and convey information and reach agreement about the purpose of the examination/treatment, techniques and procedures	SH
3	Apply knowledge of communication strategies to engender trust and confidence and respect patient confidentiality, privacy and dignity	KH
4	Respond to patient queries or issues	SH
5	Apply knowledge of likely communications barriers specific to individual patients and/or visitors	K

S.N.	Competency domain: Communication and Collaboration	Miller's Competency Level
6	Apply knowledge of obtaining informed consent	SH
7	Apply knowledge of effective and respectful working relationships with health practitioners	KH
8	Apply knowledge of professional roles and responsibilities of healthcare team members and other service providers	KH

S.N.	Competency Domain : Evidence based Learning	Miller's Competency Level
1	Apply knowledge of appropriate methods to collect and assess evidence	KH
2	Apply knowledge of the identification, access or collection of information from credible sources	KH
3	Apply knowledge of how to assess the adequacy of information to answer the issue under inquiry	KH
4	Apply knowledge of the assessment of imaging results, applying clinical reasoning and reflective processes to identify implications for practice, including limitations of practice and recognition of need to consult	KH
5	Apply knowledge of the review of clinical action plans/protocols	KH
6	Apply knowledge of legal and professional responsibilities to undertake continuing professional development (CPD)	KH
7	Apply knowledge of personal strengths and limitations to identify learning required to improve and adapt professional practice	KH
8	Apply knowledge of strategies for identifying learning needs of self and others to deliver improved patient outcomes	KH
9	Apply knowledge of planning and implementation strategies to address professional and development needs	KH
10	Apply knowledge of communication strategies to facilitate understanding and learning both within an individual and group context	KH
11	Apply knowledge of assessment, evaluation and feedback	KH

S.N.	Competency Domain : Safety of Practice and Risk Management	Miller's Competency Level
1	Apply knowledge of National and international radiation safety legislation and/or guidelines for best practice in the safe use of Medical imaging/Nuclear Medicine and radiation therapy technologies	K
2	Apply knowledge of the principles of risk management relevant to medical imaging/radiation therapy	KH
3	Apply knowledge of risk control systems and procedures	KH
4	Apply knowledge of safe medical imaging/radiation therapy practice	
5	Apply knowledge of patient identification procedures to confirm the correct match of patient with intended procedure	KH
6	Apply knowledge of risk of infection	KH
7	Apply knowledge of equipment to confirm that it is in good order and operating within acceptable parameters	K
8	Apply knowledge of the identification and appropriate action to correct unacceptable condition or operation of equipment	KH
9	Apply knowledge of protocols to record and report conformance and non-conformance of equipment	K
10	Apply knowledge of the safety hazards in the workplace and apply knowledge of responsibilities for notification	KH
11	Follow national and international radiation safety guidelines while performing radiological procedures	K
12	Use protective shields like lead aprons, lead barriers and leaded goggles when performing procedures	KH
13	Apply knowledge of medical imaging/radiation therapy related hazards and control measures to ensure the safety of others in the workplace	KH
14	Perform collimation of the area of exposure and use lowest possible exposure factors	KH
15	Apply knowledge of reporting incidents in accordance with standard protocols, procedures and legal requirements	K

S.N.	Competency Domain : Radiography Skills and Attitudes	Miller's Competency Level
1	Apply knowledge of the anatomy and physiology of the human body relevant to the scope of practice	K
2	Apply knowledge of the pathophysiology underpinning disease and injuries affecting the human body	K
3	Apply knowledge of anatomical structures, injuries and pathologies of the human body in dynamic, planar, sectional and 3D images	K
4	Perform radiologic procedure according to SOP.	KH
5	Apply skills to position the patient correctly	D
6	Produce high quality images and identify technical and clinical aspects of the image	KH
7	Recognize artifacts in radiological images and institute remedy to address them	KH
8	Practice good house-keeping after every procedure	D
9	Demonstrate a good interpersonal relationship with colleagues.	K
10	Apply knowledge of digital image processing, including fixed and mobile digital fluoroscopy systems	KH
11	Apply knowledge of patient preparation, care and aftercare and delivery systems for contrast examinations	D
12	Demonstrate understanding of the use, design and operation of CT systems	D
13	Demonstrate understanding of imaging parameters and scan protocols based on the range of patient presentations	D
14	Demonstrate understanding of post-processing techniques, including multi-planar reformats and volume imaging	KH
15	Demonstrate understanding of standard mammography examinations and when appropriate, modify them to take into account patient presentation and clinical indications	KH
16	Demonstrate understanding of the evaluation of mammographic images using mammographic criteria	KH
17	Observes the provisions to the patients' bill of right	K
18	Practice within the Code of Ethics of the profession	D
19	Adhere to the international SOPs	KH



S.N.	Competency Domain : Radiography Skills and Attitudes	Miller's Competency Level
20	Apply knowledge of dose and radioactive decay used in examinations and therapies	
21	Apply knowledge of the difference between therapeutic and diagnostic doses as it affects the patient, health practitioner and the general public	KH
22	Apply knowledge of patient preparation, care and aftercare and delivery systems for nuclear medicine radioisotope examinations	KH
23	Apply knowledge of appropriate dose delivery systems and safe aseptic techniques	KH
24	Apply knowledge of the physics of ultrasound image acquisition	KH
25	Apply knowledge of the clinical context for ultrasound imaging and ultrasound examinations including extending the examination to encompass all relevant areas	K
26	Apply knowledge of cross-sectional anatomy, embryology, pathophysiology, hemodynamics and sonographic appearances of normal and abnormal anatomy	K
27	Apply knowledge of MRI physics and instrumentation and image acquisition	KH
28	Apply knowledge of clinical decision-making in the context of the patient and requirement to adapt technique to the clinical question	KH
29	Identify the difference between ionic and non-ionic contrast media, CT and MR contrast media	K
30	Perform and select the appropriate contrast medium and dosage for appropriate examination	D
31	Execute safe and sterile injection techniques	D
32	Identify adverse contrast medium reaction and apply skills to manage adverse reactions	KH
33	Explain and provide clear instructions to the patient prior to the radiological procedure.	D
34	Prepare a supply of fresh gowns for patient use and provide privacy for changing clothes.	D

S.N.	Competency Domain : Radiography Skills and Attitudes	Miller's Competency Level
35	Transfer patient from gurney or wheel chair to the X ray table and vice versa.	D
36	Provide sufficient time for each patient to complete the procedure.	D
37	Prioritizes patient according to the set of protocols.	D
38	Establish rapport and empathy towards patients.	KH

S.N.	Competency Domain : Leadership and Management	Miller's Competency Level
1	Collaborates in planning activities for the department	K
2	Proposes way to improve patient flow and procedures	KH
3	Solve simple problems with minimal supervision in the Radiology department	K
4	Support the promotion of new imaging innovations	K

S.N.	Competency Domain : Researcher and Life Long Learner	Miller's Competency Level
1	Conduct meaningful and relevant research studies related to Medical Imaging Technology	D
2	Apply modern teaching and learning methodologies for professional development	KH
3	Undergoes further training in different fields of specialization	K
4	Pursues graduate studies	D
5	Synthesize information from journals and research articles on the latest innovations in Medical Imaging Technology	D

#### 2.10.5 Skill Competencies

S.N.	Core Skills/Procedures	Miller's Competency Level
1	Patient requisition form identification and verification	K
2	Patient preparation and positioning	D
3	Set up, Operate and proper handling of radiological (X-ray, Mammography, CT, MRI) equipments	D
4	Appropriate technique/protocol selection	KH

S.N.	Core Skills/Procedures	Miller's Competency Level
5	Radiation dosimetry and safety	K
6	Radiological Image processing, filming and evaluation	SH
7	Laboratory investigation reports for radiological procedures (Prescribe and interpret)	KH
8	Venipuncture	K
9	Radiological contrast media dosage/volume estimation	D
10	Adverse drug reactions, emergency management and safety	KH
11	Vitals Assessment	SH
12	Wound management	SH
13	Basic Life support skills	SH
14	Sterile and hygienic Housekeeping	SH
15	Documentation and reporting	K
16	Carry out the daily/weekly Quality Control (QC) checks	SH

## 2.11 Bachelor of Ayurvedic Medicine and Surgery (BAMS)

### 2.11.1 Introduction

Government of Nepal has recognized Ayurveda as the national health care system. In Nepal, Ayurveda education was formally initiated by Prime Minister Chandra Shamsher Jung Bahadur Rana providing scholarship at Jaipur Rajakiya Vidhyalaya in 1974 BS Intermediate Ayurveda course in 2029 BS (1972 AD) after implementation of new education policy under Institute of Medicine, Tribhuvan University. Ayurveda campus T.U. started Bachelor of Ayurvedic Medicine and Surgery (BAMS) in 2044 BS and NSU started BAMS in 2069 BS. In present days more than 100 Ayurveda scholars are selected for BAMS course in Nepal and also in India (under AYUSH scholarship scheme). Presently only two universities offer this course in Nepal.

When single system of medicine is unable to cure and manage all the diseases, now the entire world and WHO is looking back to the traditional system of medicines. In recent years there is high acceptance of traditional medicine and Ayurveda globally. Nepal has strong cultural and religious background in traditional medicine. Nepal having rich bio diversity, has strong possibilities in the areas of herbal medicine. BAMS course fulfills the national requirement by producing the qualified Ayurveda doctors to serve the country.

### **2.11.2 Programme Objectives**

1. Producing graduates, having profound knowledge, skills and attitude towards Ashtanga Ayurveda supplemented with knowledge of scientific advances in modern medicine.
2. To produce professionally competent human resources in the area of service, education and research.
3. Integrate and apply the knowledge and skill for identification, processing, mode of action, therapeutic indications and uses of Ayurveda herbs and herbo mineral drugs.
4. Provide effective and efficient services in development of physical, mental and spiritual wellbeing of mankind.
5. Practice evidence based ayurvedic medicine.
6. Appreciate the psycho-social, cultural, economic and environmental factors affecting health and provide compassionate care.
7. Practice with medical ethics in patient care, service delivery and research.

### **2.11.3 Areas of Learning**

1. Sanskrit
2. Moulik Siddhanta and Astanga Hridayam/Sangraha (Basic Principles of Ayurveda and Ancient Text)
3. Padartha Vigyan (Philosophy of Ayurveda)
4. Ayurveda ko Itihas (History of Ayurveda)
5. Sharira Rachana Vigyan (Human Anatomy)
6. Sharira Kriya Vigyan (Human Physiology)
7. Swastavritta and Yoga (Social and Preventive Medicine and Yoga)
8. Dravyaguna Vigyan (Herbal Medicine and its Pharmacology)
9. Agadatanta and Vyavaharayurveda and Vidhividhayak (Toxicology, Forensic Medicine and Medical Jurisprudence)
10. Charak Samhita –Purvardha (Ancient Ayurvedic Text)
11. Rasa Sastra evum Bhaiasajya Kalpana (Herbal and mineral Ayurvedic Pharmaceutics)
12. Roga vigyan evum Vikriti Vigyan (Ayurvedic Pathology)
13. Charaka Samhita –Uttarardha (Ancient Ayurvedic Text)
14. Research Methodology and Medical Statistics
15. Kayachikitsa (Ayurvedic General Medicine, Psychiatry, Panchakarma, Rejuvenation and Aphrodisiac)
16. Shalya Tanta (Surgery)
17. Shalakya Tantra (ENT and Dentistry)
18. Kaumarabhritya (Pediatrics)
19. Prasuti Tantra and Stree Roga (Gynaecology and Obstetrics)
20. Panchakarma

#### **2.11.4 Core Competencies**

1. Take relevant medical history and perform clinical examinations and apply principles of Ayurveda into medical practice.
2. Carry out professional responsibilities related to individual, family, community and society at large with concern and care.
3. Demonstrate sound knowledge of structure and functions of human body and their relation to health and disease.
4. Communicate with patients and their families, colleagues and members of health care team with respect, politeness and compassion. Apply principles of medical ethics in the practice of medical profession.
5. Manage medical emergencies and health problems appropriately.
6. Recognize clinical conditions that require referral, give initial treatment and refer to appropriate health care facilities.
7. Recognize various biological and social determinants of health of an individual as well as the population.
8. Address preventive, promotive and rehabilitative health problems as per Ayurveda principles.
9. Apply principles of Primary Health Care in the health care service and function as a leader of the health care team.
10. Identify and carry out necessary medico-legal procedures.
11. Continue to acquire new knowledge and skills by employing different methods of continuing professional development.
12. Critically appraise scientific literature and conduct research in health relevant to his or her area of work.
13. Carry out different surgical and para surgical procedures as per Ayurvedic principles.
14. Perform Panchakarma procedures for bio cleansing and detoxification of the body followed by rejuvenation.
15. Prescribe Ayurvedic medicines and counselling for common health issues.
16. Prescribe medication and manage various gynecological and obstetrics related disorders.
17. Manage various mental health issues and lifestyle related diseases and educate the same.
18. Prepare and prescribe mono herbal or poly herbal formulations for various health conditions.
19. Educate the general population regarding healthy diet and lifestyle.
20. Teach yoga and meditation to patients and general public.
21. Use medical informatics effectively.

### 2.11.5 Skill Competencies

Major Areas	Skills and Procedures	Miller's Competency Level
Basics of Human body	<ol style="list-style-type: none"> <li>1. Details of Human anatomy and physiology</li> <li>2. Dissection of human body</li> <li>3. Basic Hematological tests like CBC, TCDC, ESR, Hb%</li> <li>4. Basics of microbiology and biochemistry</li> </ol>	<p>K KH SH/D K</p>
Basic Principles of Ayurveda	<ol style="list-style-type: none"> <li>1. Basic principles of Ayurveda and its practical applications</li> <li>2. Analysis of individual Prakriti and Sara</li> <li>3. Astavidha and Dasavidha Pariksha</li> <li>4. Assesment of Agni and Ama</li> <li>5. Locates Marma in human body</li> </ol>	<p>K D D KH SH</p>
Wellbeing and Spirituality	<ol style="list-style-type: none"> <li>1. Counselling about the healthy diet and lifestyle</li> <li>2. Advice Dinacharya and Rhitucharya as per ayurveda texts</li> <li>3. Knowledge of Yoga and its clinical application</li> <li>4. Advice Rasayana Therapy and herbs</li> <li>5. Basic Spa Therapies</li> </ol>	<p>SH / D KH KH SH/D K</p>
Herbal Pharmacology and Pharmaceutics	<ol style="list-style-type: none"> <li>1. Identification of plants and dried specimens</li> <li>2. Preparation of herbarium, preservation of samples</li> <li>3. Properties of herbal medicines and its mode of action</li> <li>4. Preparation of basic mono herbal and polyherbal medicines</li> <li>5. Preparation of Panchavidha Kashaya Kalpana</li> <li>6. Manufacturing techniques of various ayurvedic medicines</li> <li>7. Herbal cosmetic preparations</li> <li>8. Identification of Toxic plants and minerals, poisonous insects</li> </ol>	<p>K SH KH K KH D K K K</p>

Major Areas	Skills and Procedures	Miller's Competency Level
General Clinical Practice	1. History taking and Clinical examination of the patients	SH/D
	2. Basic knowledge of diagnostic procedures	KH
	3. Ayurvedic prescription writing for common medical conditions	K
	4. Management of common lifestyle disorders, non-communicable disease, common mental health issues	KH K K
	5. Counselling of diet and lifestyle	SH
Basic Surgical and Gynecological Skills	1. Gynecological, surgical and ENT history taking and examinations	D K
	2. Normal Labour	KH/SH
	3. LSCS and Hysterectomy	SH/D
	4. Yoni Pichu, Prakshalana, Dhupana	SH/D
	5. Uttara Basti Karma	SH/D
	6. Agni Karma	SH/D
	7. Kshara Application and Ksharasutra	K
	8. Suturing and wound dressing	K
	9. Leech application	K
	10. Basic general surgical procedure	K
Panchakarma	1. Local and whole-body massages (Abhyanga)	SH/D
	2. Local and whole-body steam (Swedana)	SH/D
	3. Shirodhara, Kati Basti, Janu Basti, Lepana, Pottali, Patra Pinda, Nasya,	SH/D SH/D
	4. Dhupana, Pichu	KH
	5. Vamana, Virechana, Basti	KH

## 2.12 Bachelor of Science in Laboratory Medicine (B.Sc. Lab. Med.) / Bachelor of Science in Medical Laboratory Technology (B.Sc. MLT)

### 2.12.1 Introduction

Laboratory medicine refers to the discipline of modern medicine involved in the selection, provision and interpretation of laboratory-based diagnostic testing. Clinical laboratory investigations are meant for: diagnosis i.e. confirming a clinical suspicion, assisting in the selection, optimization and monitoring of treatment, providing a prognosis and screening health. Moreover, laboratory medicine contributes vital role in providing scientific

evidence for the clinical practice and research. Although the essential of laboratory medicine practice is based on the pre-analytical, analytical and post-analytical elements of routine service, it is reinforced by education and research, with the whole delivered efficiently through strong clinical leadership and management. In many cases, the laboratory medicine service also encompasses clinical laboratory service involving direct patient care. Total quality management of the whole process is an important part of both leadership and management of the service, including service accreditation and clinical governance embracing data management, quality control and proficiency testing, clinical audit and benchmarking. Thus, highly competent and skilled university graduates are in current demand in Nepal and worldwide.

A well-trained laboratory scientist is essential to ensure that clinical laboratory have the capacity to carry out the crucial activities that are needed to safeguard the public's health competently and effectively. Lack of adequate training poses challenges because medical laboratory officers require a range of scientific, leadership and managerial development courses, ideally based on 'competencies', to function effectively in their positions.

Currently universities are producing limited number of graduates in laboratory medicine per year. However, due to increase in health infrastructures of the country, emerging new diseases and newer diagnostic tests and techniques, quality human resources are still lacking to meet the current demand.

After the federalism in Nepal, Public Health Laboratory service has been started at all the provincial level to provide quick, reliable and cost-effective laboratory diagnostic services to the public. Similarly, rapidly developing health facilities up to the local municipal level and upgrading of federal, provincial and primary hospitals have also raised the need of qualified medical laboratory officers in the country. National Health Policy, 2019 AD and National Education Policy, 2019 AD have emphasized about the development and expansion of trained and competent health workforce with appropriate skills to ensure quality health care universally accessible and effective, focus on production of specialized human resources to develop and implement integrated and competency-based curriculum in medical education.

Bachelor of Science in Laboratory Medicine (B.Sc. Lab. Med.) program is also recognized as Bachelor of Science in Medical Laboratory Technology (B.Sc. MLT) or Bachelor of Science in Medical Laboratory Sciences (BMLS) in Nepal and worldwide.

B.Sc. Lab. Med. is four-year undergraduate course to produce skilled laboratory medicine personnel equipped with professional knowledge, skills and attitudes. Laboratory medicine graduates commonly referred as Medical Technologists, also called Medical Laboratory



officer. Upon graduation, they will have career opportunities in hospitals, diagnostic laboratories, clinics, blood banks, forensic laboratories, biomedical, training technicians and pharmaceutical industries and biomedical research centers globally.

Medical Education Commission (MEC), Nepal Health Professional Council (NHPC), and different associations of medical laboratory, have realized competency development as a means of strengthening the laboratory health workforce. Competencies improve the workforce by providing a guiding framework for producing education and training programs, identifying roles and job responsibilities, and assessing individual and organizational performance. Therefore, MEC has taken the lead for the development of curriculum framework required for the laboratory medicine course. This framework ensures harmonization, facilitates curricular consistency and equivalence. The National Curriculum Framework of Nepal for undergraduate laboratory medicine emphasizes competency-based education using a course-based approach with competencies across five domains that prepares graduates to function effectively in their positions (adapted from domains of Competence Standards for Medical Laboratory Science Practitioners in New Zealand, 2018 AD).

### ***2.12.2 Programme Objectives***

The objective of the B.Sc. Lab. Med. program is to produce competent Medical Laboratory Officers/Scientist/Technologist graduates in the nation to deliver evidence-based laboratory medicine services to support the sustainable development of modern medicine practice worldwide.

After completion of B.Sc. Lab. Med. program, university graduates will be able to:

1. Perform and report laboratory investigations independently
2. Interpret the results and explain underlying principles in each investigation
3. Prepare reagents/kits required for laboratory investigation
4. Participate in teaching learning activities
5. Set up clinical laboratories
6. Perform total laboratory quality management and selection and validation of laboratory techniques
7. Assist and take part in clinical and molecular research
8. Perform managerial works, supervision of subordinates, preparation of periodic reports and maintenance of inventory, Assist health policy and administration

### **2.12.3 Areas of Learning**

1. Fundamental of Laboratory Medicine
2. Anatomy
3. Physiology
4. General Chemistry and Biochemistry
5. Microbiology
6. Hematology
7. Pathology
8. Histopathology and Cytopathology
9. Pharmacology
10. Clinical Biochemistry
11. Clinical Microbiology
  - Bacteriology
  - Virology
  - Mycology
  - Parasitology
  - Immunology
12. Immunohematology and Transfusion Medicine
13. Human Genetic and Molecular Biology
14. Epidemiology and Preventive Medicine
15. Health Policy and Health Administration
16. Biostatistics and Research Methodology
17. General Medicine
18. Medical Jurisprudence/Medical Ethics and Forensic Medicine
19. Laboratory Management and Quality Control
20. Automation and Recent Advances/Laboratory Instrument Maintenance and care
21. Medical Laboratory Informatics

### **2.12.4 Core Competencies:**

1. Plan for basic laboratory setup.
2. Perform ethical laboratory practice following national and international guidelines.
3. Adopt good clinical laboratory practice (GCLP).
4. Select appropriate test method and instruments and validate them.
5. Develop and evaluate standard operating procedure for different test done in the laboratory.
6. Prepare and counsel patient for sample collection.
7. Perform techniques for basic life support.
8. Collect different specimen to perform laboratory tests.
9. Handle, transport, process and preservation of clinical specimens.
10. Prepare different stock and working reagents.

11. Operate different test manually and using automated analytical system.
12. Perform routine and specialized clinical pathology tests including biochemistry, microbiology, immunology, hematology and blood banking and transfusion medicine.
13. Validate and Interpret test results.
14. Preparation and screening of slides for histological and cytological examinations.
15. Communicate critical test results whilst maintaining patient confidentiality.
16. Recommend further necessary test if required to the physician.
17. Perform Total Laboratory Quality Management System.
18. Use laboratory information management system (LIMS).
19. Assure quality of performed test using different quality indicators.
20. Plan and manage laboratory inventory.
21. Carry out routine maintenance and troubleshooting of the laboratory instruments.
22. Assure biosafety and biosecurity.
23. Implementation of proper biological waste management to prevent biohazards.
24. Emphasize diagnostic stewardship and antimicrobial stewardship.
25. Conduct clinical and scientific research and trainings.
26. Teaching and training for certificate courses of laboratory science.

S.N.	Competency Domain: Communication, Leadership, Professionalism and Ethical practice	Miller's Competency Level
1	Apply appropriate communication skills to interact with other colleagues, professionals, patients and their families and supporting staff	D
2	Exchange information, professional knowledge and experience with professional colleagues	KH
3	Work constructively in a team/ group and cooperate with other colleagues and professionals	D
4	Understand and respect the roles and expertise of health and social care professionals in the context of working and learning as a multi-professional team	KH
5	Apply appropriate ethical and legal standards while performing laboratory tests in accordance with health care rule and regulations of Nepal	KH
6	Practice in accordance with professional ethics and code of conduct	D
7	Recognize the importance of maintaining professional growth and life-long learning	K

<b>S.N.</b>	<b>Competency Domain: Communication, Leadership, Professionalism and Ethical practice</b>	<b>Miller's Competency Level</b>
8	Apply and demonstrate principles of Total Quality Management (TQM)	D
9	Assess the scientific evidence published in professional journals and Integrate scientific research with for optimum evidence-based care	KH
10	Understand the opportunities for improving health beyond his/her practice through participation and outreach and community based clinical and health promotion educational activities	K
11	Communicate clearly, precisely and appropriately with patients, visitors and colleagues	D
12	Demonstrate collaboration with other healthcare team members	SH
13	Demonstrate conflict management skills where necessary	KH
14	Become flexible and dedicated to work and work place	SH
15	Ensure confidentiality with patients and other healthcare professionals	KH
16	Demonstrate leadership and practice management skills	SH
17	Prioritise work and implement innovative ideas	KH
18	Engage with students/interns/ residents	D
19	Demonstrate flexibility and adaptability in uncertain situation	SH

<b>S.N.</b>	<b>Competency Domain: Evidence Based Practice and Learning, Safety of Practice and Risk Management</b>	<b>Miller's Competency Level</b>
1	Engage in continuous self –development	KH
2	Be aware of and identify the new technology and instruments in the market	K
3	Confirm the correct match of patient with intended procedure	SH
4	Minimize risk of laboratory hazard (biohazard, chemical hazard etc.)	KH
5	Keep equipment in good order and operating within acceptable parameters	SH
6	Identification and appropriate action to correct unacceptable condition or operation of equipment	KH

S.N.	Competency Domain: Evidence Based Practice and Learning, Safety of Practice and Risk Management	Miller's Competency Level
7	Use protocols to record and report conformance and non-conformance of equipment	SH
8	Use protective shields like gown, aprons and goggles when performing procedures	D

S.N.	Competency Domain: Laboratory Medicine Practice	Miller's Competency Level
1	Identify individual human bones	D
2	Identify common surgical instruments and their uses	KH
3	Identify human body sections and organs	KH
4	Use light microscope properly and identify basic and system related histological slides	D
5	Identify important surgical landmarks necessary for clinical applications	D
6	Identify and give the embryological basis of common congenital anomalies in all the organ systems	KH
7	Read karyogram and outline pedigree chart	KH
8	Perform Surface marking of heart, lungs, liver, kidneys and major blood vessels	D
9	Locate Mc Burney's point, deep and superficial inguinal ring, saphenous opening, surface marking of inguinal canal	SH
10	Explore femoral triangle to identify femoral nerve, artery and femoral vein	SH
11	Demonstrate Site / position for needle insertion in thoracentesis	SH
12	Explore/ dissect knee joint to identify medial and lateral collateral ligament, menisci and intracapsular ligaments and functions of meniscus and ligament (ACL, PCL and collateral ligaments)	SH
13	Trace the peritoneal lining around abdominal viscera and pelvic region with their modification and functions of peritoneum	KH
14	Dissect body spaces like axilla, cubital fossa, femoral triangle, popliteal fossa, anterior and posterior triangle of neck	SH
15	Be able to identify visceral organs	KH

S.N.	Competency Domain: Laboratory Medicine Practice	Miller's Competency Level
16	Demonstrate long bones with its side in anatomical position (femur, tibia, fibula, hip bone, humerus, radius, ulna and scapula, typical and atypical ribs)	D
17	Measure Blood Pressures at different sites	D
18	Measure pulse rate and interpretation of types of pulse	D
19	Perform clinical examination of respiratory system in sequence	D
20	Calculate and interpret respiratory dead space and ventilation/perfusion ratio	SH
21	Record and read lung volumes and capacities(spirogram/spirometry)	SH
22	Identify bronchial and vesicular breath sounds and Elicit vocal fremitus and vocal resonance	KH
23	Auscultate for heart sounds and correlate with cardiac cycle	KH
24	Perform and Interpret normal and abnormal ECG	KH
25	Calculate and interpret cardiac output	KH
26	Performs cardio respiratory resuscitation in a sequence of ABC management in a dummy	D
27	Perform per abdominal physical examination	SH
28	Perform perimetry and identify size of blind spot	KH
29	Test monosynaptic and polysynaptic reflexes	KH
30	Perform sympathetic and parasympathetic nervous system stimulation tests	KH
31	Examine motor and sensory functions of nervous system and test superficial and deep reflexes for spinal cord functions and related neural pathways	KH
32	Select and interpret different biochemical tests e.g., renal function test, cardiac function test, liver function tests, lipid profile, thyroid function, hormone analysis and tumor markers	D
33	Perform qualitative analysis of carbohydrates, protein and amino acids	D
34	Ability to accurately weigh and measure ingredients	D
35	Ability to demonstrate preparation techniques and use of equipment (e.g., grinding, mixing, blending, balances and calibrated measures)	D

S.N.	Competency Domain: Laboratory Medicine Practice	Miller's Competency Level
36	Use biochemical equipment e.g., pipettes, colorimeter, spectrophotometer, centrifuge, electrophoresis, Ion-selective electrode	D
37	Isolate, purify and perform analysis of DNA from cell and acquainted with molecular techniques e.g., PCR	D
38	Perform sterilization and disinfection	D
39	Perform common staining procedure e.g., Ziehl-Nielsen, Gram stain, Giemsa stain, Albert stain, KOH preparation and India ink method	D
40	Collect, preserve and transport clinical samples for microbiological investigation	D
41	Perform inoculation of specimen in different media for growth of bacteria and fungus	D
42	Identify common bacterial and fungal growth in culture medium by the use of basic microbiological techniques e.g., use of selective media, colony characteristics, culture condition, biochemical tests and microscopy	D
43	Perform antibiotic sensitivity test to select suitable antimicrobial agents	D
44	Identify common blood and intestinal parasites with the help of simple laboratory procedure e.g., stool examination, staining and microscopy	D
45	Select and interpret microbiological tests for the diagnosis of infectious diseases	D
46	Perform and interpret peripheral blood smear for common anemias and leukemias	SH
47	Correlate normal and altered morphology (gross and microscopic) of different organ systems in common diseases to the extent needed for understanding of disease processes and their clinical significance	KH
48	Apply knowledge of the anatomy and physiology of the human body relevant to the scope of practice	KH
49	Apply knowledge of the pathophysiology underpinning disease and injuries affecting the human body	KH

S.N.	Competency Domain: Laboratory Medicine Practice	Miller's Competency Level
50	Justify the rationale and principles of technical procedures of the diagnostic laboratory tests and interpretation of the results	KH
51	Perform simple tests on blood, urine and other biological fluid samples	D
52	Draw a rational scheme of investigations aimed at diagnosing and managing the cases of common disorders	KH
53	Apply general principles of basic pharmacology focusing on pharmacokinetics and pharmacodynamics of drugs in therapeutics	K
54	Identify the importance of rational use of medicine	KH
55	Identify and apply the principle of essential drugs and standard treatment guidelines	KH
56	Identify and report adverse drug reaction (ADR)	KH
57	Calculate the doses of common drugs used in therapeutics	SH
58	Identify antimicrobial resistance and develop and implement infection control guidelines	KH
59	Recognize the prohibited drugs as per the national guidelines	K
60	Collect information and report outbreak in the population	D

### 2.12.5 Core Skills

S.N.	Core skills/Procedures/techniques	Miller's Competency Level
1	Perform Aseptic techniques, sterilization, disinfection, antisepsis	D
2	Use Universal precaution/Standard precaution	D
3	Perform phlebotomy procedure	D
4	Collect midstream urine, sputum, wound swab, vaginal swab, endocervical swab, semen, urethral discharge, capillary blood, arterial blood, cerebrospinal fluid, ascitic fluid, pleural fluid, synovial fluid specimen collection and processing for different laboratory investigations	D
5	Transport and storage of clinical specimens	D
6	Prepare standard solutions, reagents, buffers and culture media	D



S.N.	Core skills/Procedures/techniques	Miller's Competency Level
7	Use Centrifugation for sample processing	D
8	Use Microscope for various purposes	D
9	Operate and perform daily Laboratory Equipment Maintenance: spectrophotometer, coulter counter, biosafety cabinet, biochemistry analyzer, tissue processor, microtome	D
10	Develop and implement standard operating procedures	D
11	Perform Staining of peripheral blood smear and bone marrow	D
12	Perform Manual cell counting for RBC, WBC and platelets	D
13	Perform ESR estimation using different techniques	D
14	Use Hemoglobinometry and other techniques for the estimation of hemoglobin	D
15	Perform Sickling test, Osmotic fragility test and Coombs test	D
16	Perform Blood grouping and cross matching	D
17	Perform Tests for bleeding disorder	D
18	Perform Aerobic and anaerobic culture of clinical specimens	D
19	Perform Antibiotic susceptibility testing by disc diffusion method	D
20	Perform Minimum inhibitory concentration determination	D
21	Perform Bacteriological examination of water, air and milk	D
22	Perform Sterility testing	D
23	Perform Fungal culture and viral cultivation	SH
24	Perform Routine Stool examination by using different techniques	D
25	Perform Routine Urine examination	D
26	Perform Semen analysis	D
27	Perform Occult blood test in stool	D
28	Perform Serological tests (agglutination, precipitation, ELISA) for common viral and bacterial infections	D
29	Demonstration of blood parasite	D
30	Demonstration of tissue parasite	D
31	Process specimens for histopathological and cytopathological examination	D
32	Prepare for Fine needle aspiration	KH

S.N.	Core skills/Procedures/techniques	Miller's Competency Level
33	Perform Liquid-based cytology	KH
34	Perform Body fluid analysis	D
35	Prepare slides of Immunohistochemistry	D
36	Prepare sample for Flow cytometry	D
37	Isolate nucleic acid (DNA, RNA) and Perform PCR	SH
38	Perform Electrophoresis and chromatography	SH
39	Perform Clinical estimation of glucose, lipid profile	D
40	Perform Qualitative test for inborn error of metabolism	KH
41	Perform Blood gas analysis	D
42	Perform Iron profile test	D
43	Perform test for muscle and Cardiac biomarkers	D
44	Perform organ function tests eg. Liver function test, kidney function test, pancreatic function test, gastric function test etc.	D
45	Perform Renal stone analysis	KH
46	Perform Hormone assay	D
47	Practice Internal Quality control	D
48	Practice External Quality Assessment	D
49	Perform Plasmapheresis and component separation	D
50	Demonstrate laboratory information system and reporting	D
51	Demonstrate laboratory stock maintenance and inventory	D

## 2.13 Bachelor of Medicine and Bachelor of Surgery (MBBS)

### 2.13.1 Introduction

Nepal started the Bachelor of Medicine and Bachelor of Surgery (MBBS) programme in July 1978 under the aegis of Tribhuvan University, Institute of Medicine. Medical course in the initial days was basically community based, system wise and had integrated teaching as a SPICE model. Later on, problem-based learning was introduced in the medical education of Nepal. Globally the medical education trend has shifted towards competency-based.

The health status of Nepal, has changed a lot over the period of forty years. The main health problem was communicable diseases and major focus was on its prevention. Health indicators show that Nepal has made progress in raising the health status of its citizens. Rapid unplanned urbanization has direct effect on people's health, risking for both

communicable and non-communicable diseases. Natural disasters, road traffic accidents and industrial accidents pose their own health problems in Nepal.

Nepal government is moving towards addressing equity gaps and focusing on making services accessible to the population in need. This will be possible only by training adequate different level health manpower in the country, so is the undergraduate programme in medicine.

Competency-based medical education is an outcome-based approach that ensures all learners achieve the desired patient centered outcomes during their training. To address competency-based education there is a need for common curriculum framework that prepares to meet the health needs of the country. Such framework will provide curricular consistency that aims to harmonize in producing equally competent graduates from all the universities and academia across the country. The framework would outline the essential knowledge and skills required in medical science along with the concepts of health care delivery and health development important for the country to produce socially responsible and competent physicians, willing and able to meet the existing and emerging challenges of national and international health care system.

### ***2.13.2 Programme Objectives***

On completion of the course, the graduates will be able to:

1. Take relevant medical history and perform clinical examination.
2. Apply principles of medicine into practice.
3. Demonstrate sound knowledge of structure and function of human body and their relation to health and disease.
4. Communicate with patients and their families, colleagues and members of health care team with respect, politeness and compassion.
5. Carry out professional responsibilities related to individual, family, community and society at large with concern and care.
6. Manage life threatening medical emergencies.
7. Manage health problems appropriately.
8. Use antimicrobial agents effectively and judiciously and prevent emergence of drug resistant microbes.
9. Recognize various biological and social determinants of health of an individual as well as the population.
10. Plan and manage preventive, promotive and rehabilitative health problems and emerging diseases.
11. Function as a leader of the health care team.
12. Identify and carry out necessary medico-legal procedures.

13. Apply principles of medical ethics in professional medical practice.
14. Apply infection prevention practices in health institutions and clinical practice.
15. Continue to acquire new knowledge and skills by employing different methods of continuing professional development.
16. Critically appraise scientific literature.
17. Conduct research in health related area of work.
18. Use medical informatics effectively.
19. Perform basic laboratory tests and interpret the results.

### **2.13.3 Areas of Learning**

1. Anatomy
2. Physiology
3. Biochemistry
4. Microbiology
5. Pathology
6. Pharmacology
7. Community Medicine
8. Forensic Medicine
9. Internal Medicine
10. General Surgery
11. Paediatrics
12. Obstetrics and Gynaecology
13. Ophthalmology
14. Otorhinolaryngology
15. Orthopaedics
16. Dermatology
17. Psychiatry
18. Anaesthesiology
19. Radiology
20. Stomatology (Dental Science)
21. General Practice and Emergency Medicine

### **2.13.4 Core Competencies**

1. Non-surgical care: This domain includes ability to conduct the comprehensive patient evaluations, synthesizing information to determine the diagnosis and formulating management plan. (including emergency care).
2. Surgical care: This domain includes performing pre and post-operative examination of patient and manage them (including emergency care).
3. Preventive and Promotive care: This domain includes providing health promotion to preserve and optimize general health.

4. Palliative and rehabilitative care: This domain includes ability to facilitate care to those who do not need/have access to hospital care and to those who are on chronic care.
5. Communication and Leadership: The domain includes obtaining, discussing and sharing information with patients, their families and everyone involved in caring for the patient. Developing multidisciplinary relationships and partnerships to promote quality health services.
6. Professionalism: Acts in accordance with professional standards of good ethical behaviour and practice, commitment and accountability (both self and social).

S.N.	Competency domain : Communication, Leadership and Professionalism	Miller's Competency Level
1	Apply appropriate communication skills to interact with patients and their families and supporting staff	SH/D
2	Exchange information, professional knowledge and experience with professional colleagues	KH
3	Learn to work constructively in a team/ group and cooperate with other colleagues and professionals	KH
4	Understand and respect the roles and expertise of health and social care professionals in the context of working and learning as a multi-professional team	KH
5	Apply psychosocial and behavioral principles in patient centered health care	KH
6	Apply appropriate ethical and legal standards in providing patient centered care in accordance with health care rules and regulations of Nepal	KH
7	Practice in accordance with professional ethics and code of conduct	SH
8	Recognize the importance of maintaining professional growth and life-long learning	K
9	Apply and demonstrate practice management skills and quality assurance principles	KH/SH
10	Maintain and utilize patients records. Recognize and practice new concepts and modalities of health care delivery	KH
11	Assess the scientific evidence published in professional journals and apply scientific research outcomes in evidence-based care	KH
12	Understand the opportunities for improving health beyond his/her practice through outreach community based clinical and health promotion educational activities	K/KH

S.N.	Competency domain : Communication, Leadership and Professionalism	Miller's Competency Level
13	Provide appropriate means of prevention, intervention and educational strategies for all patients at risk	SH

Competency assessment in Basic Medical Sciences is mainly acquisition/accumulation of knowledge that plays a major role in laying foundation to understand the Clinical Sciences. Incorporating the listed skills from basic sciences years will reflect on their clinical competency.

S.N.	Competency domain: Skills and Procedures	Miller's Competency Level
1	Identify individual human bones.	KH
2	Identify common surgical instruments, can hold scalpel appropriately and dissect	KH/SH
3	Identify human body sections(region) and organs	KH
4	Use light microscope properly and identify basic and system related histological slides	SH
5	Identify important surgical landmarks necessary for clinical applications	SH
6	Identify and give the embryological basis of common congenital anomalies in all the organ systems	KH
7	Read normal X-ray and differentiate between plain and contrast X-rays	SH
8	Read karyogram and outline pedigree chart	KH
9	Perform Surface marking of heart, lungs, liver, kidneys and major blood vessels	SH
10	Locate Mc Burney's point, deep and superficial inguinal ring, saphenous opening, surface marking of inguinal canal	SH
11	Explore femoral triangle to identify femoral nerve, artery and femoral vein	SH
12	Demonstrate Site/ position for needle insertion in thoracentesis	SH
13	Explore/ dissect knee joint to identify medial and lateral collateral ligament, menisci and intracapsular ligaments and functions of meniscus and ligament (ACL, PCL and collateral ligaments)	SH

S.N.	Competency domain: Skills and Procedures	Miller's Competency Level
14	Trace the peritoneal lining around abdominal viscera and pelvic region with their modification and functions of peritoneum	SH
15	Dissect body spaces like axilla, cubital fossa, femoral triangle, popliteal fossa, anterior and posterior triangle of neck	SH
16	Be able to identify visceral organs	KH
17	Demonstrate long bones with its side in anatomical position (femur, tibia, fibula, hip bone, humerus, radius, ulna and scapula, typical and atypical ribs)	SH
18	Measure Blood Pressures at different sites	D
19	Skill for pulse recording and interpretation of types of pulse	D
20	Prepare thick and thin blood smear to perform differential WBC count	D
21	Perform total blood cell count (RBC, WBC, Platelets), blood grouping, Bleeding time and clotting time	D
22	Measure blood Hemoglobin and ESR level	D
23	Perform clinical examination of respiratory system in sequence	D
24	Calculate and interpret respiratory dead space and ventilation/perfusion ratio	D
25	Record and read lung volumes and capacities (spirogram/spirometry)	SH
26	Identify bronchial and vesicular breath sounds and Elicit vocal fremitus and vocal resonance	KH
27	Auscultate for heart sounds and correlate with cardiac cycle	D
28	Perform and Interpret normal and abnormal ECG	D
29	Calculate and interpret cardiac output	KH
30	Performs cardio respiratory resuscitation in a sequence of ABC management in a dummy	D
31	Perform per abdominal physical examination	D
32	Perform Perimetry and identify size of blind spot	D
33	Test monosynaptic and polysynaptic reflexes	D
34	Perform sympathetic and parasympathetic nervous system stimulation tests	D

S.N.	Competency domain: Skills and Procedures	Miller's Competency Level
35	Examine motor and sensory functions of nervous system and test superficial and deep reflexes for spinal cord functions and related neural pathways.	D
36	Perform clinical examination of 12 pairs of cranial nerves in human subjects	D
37	Prescribe and interpret different biochemical tests e.g., renal function test, cardiac function test, liver function tests, lipid profile, thyroid function, hormone analysis and tumor markers, etc.	KH
38	Perform qualitative analysis of carbohydrates, protein and amino acids	SH
39	Collect, preserve and transport different type of sample (blood, body fluids) for biochemical tests	D
40	Use biochemical equipments e.g., pipettes, colorimeter, spectrophotometer, centrifuge, electrophoresis, Ion-selective electrode, etc.	SH
41	Perform common quantitative biochemical tests in blood and urine samples (e.g., glucose, urea, creatinine, bilirubin, cholesterol, uric acid, albumin and protein) and be able to interpret them	SH
42	Use point of care testing (POCT) devices to perform different tests (dipstick test strips, Glucometer, Rapid chromatographic immunoassay based diagnostic kits for common tests, etc.) and interpret the findings	SH
43	Isolate, purify and perform analysis of DNA from cell and acquainted with molecular techniques e.g., PCR	SH
44	Perform sterilization	SH
45	Perform common staining procedure e.g., Ziehl-Nielsen, Gram stain, Giemsa stain, Albert stain, KOH preparation and India ink method,	SH
46	Collect, preserve and transport clinical samples for microbiological investigation	SH
47	Perform inoculation of specimen in different media for growth of bacteria and fungus.	SH



S.N.	Competency domain: Skills and Procedures	Miller's Competency Level
48	Identify common bacterial and fungal growth in culture medium by the use of basic microbiological techniques e.g: use of selective media, colony characteristics, culture condition, biochemical tests and microscopy	KH/SH
49	Perform antibiotic sensitivity test to select suitable antimicrobial agents	D
50	Identify common blood and intestinal parasites with the help of simple laboratory procedure e.g., staining and microscopy	D
51	Prescribe and interpret microbiological tests for the diagnosis of infectious diseases	KH
52	Perform and interpret peripheral smear for common anemias and leukemias	D
53	Correlate normal and altered morphology (gross and microscopic) of different organ systems in common diseases to the extent needed for understanding of disease processes and their clinical significance	KH
54	Justify the rationale and principles of technical procedures of the diagnostic laboratory tests and interpretation of the results	KH
55	Perform simple tests on blood, urine and other biological fluid samples	SH
56	Draw a rational scheme of investigations aimed at diagnosing and managing the cases of common disorders	KH
57	Apply general principles of basic pharmacology focusing on pharmacokinetics and pharmacodynamics of drugs in therapeutics	K
58	Identify the importance of rational use of medicine and process of rational prescribing in health care	KH
59	Identify and apply the principle of essential drugs and standard treatment guidelines	KH
60	Identify and report adverse drug reaction (ADR)	KH
61	Implement the P-drug concept	KH
62	Calculate the doses of common drugs used in therapeutics	KH
63	Identify antimicrobial resistance and develop and implement infection control guidelines	KH

S.N.	Competency domain: Skills and Procedures	Miller's Competency Level
64	Perform appropriate scientific attitude and managerial skills regarding drug	D
65	Critically evaluate a drug promotion literature	KH
66	Recognize the prohibited drugs as per the national guidelines	KH
67	Identify professional misconduct of a Registered Medical Doctor	KH
68	Give deposition in the court of law as a medical expert and differentiates between Civil and Criminal Negligence in clinical settings. (break into two)	KH
69	Collect, preserve and dispatch the medico-legally important specimen /evidence maintaining chain of custody	KH
70	Perform proper examination of victims and /or perpetrators of assault, violent and abuse and prepare report accordingly	D
71	Examine, collect/preserve evidence and prepare medico-legal report on alleged case of drunkenness, drug abuse and poisoning in living and dead	KH/SH/D
72	Perform medico-legal examination including autopsy and interpret the findings and prepare a report accordingly	SH
73	Write discharge and death certificate properly and authentically as per ICD	SH
74	Perform the steps on identification of the dead and management of the dead bodies during disaster/natural calamities	SH
75	Keep proper records of medicolegal cases	KH
76	Connect the epidemiological triad to understand disease causation, prevention and management	KH
77	Interpret case-control studies, cohort studies and randomised controlled trials	KH
78	Prepare a research proposal	SH
79	Conduct a research study, prepare a report and interpret	SH
80	Apply biostatistical tools (software e.g., SPSS) in research	SH
81	Work within national health policy	KH
82	Use tools to assess health of the population and determinants of health	SH

S.N.	Competency domain: Skills and Procedures	Miller's Competency Level
83	Use and interpret the MIS (Health management Information system) existing in health system of Nepal	SH
84	Demonstrate Leadership, teamwork, communication and problem solving skills	SH
85	Collect information and report outbreak in the population	KH
86	Design appropriate interventional programs	SH
87	Demonstrate the steps of effective counseling incorporating medical humanities and ethics	SH

### 2.13.5 Skill Competencies

S.N.	Skill Competencies	Miller's Competency Level	
		At the End of Final Year	At the End of Internship
1	Take relevant medical history and perform clinical examination	SH	D
2	Formulate initial management plan	KH	D
3	Formulate treatment options	KH	D
4	Mental state examination	SH	D
5	Detect signs of raised intracranial pressure	SH	D
6	Rational prescription writing	SH	D
7	Triaging of patients	SH	D
8	Injection techniques (IM/SC/ID/IV)		
9	Venepuncture	SH	D
10	IV cannulation and venous blood sampling	SH	D
11	Demonstrate correct procedure for hand washing, gloving and gowning	SH	SH/D
12	Intra osseous needle insertion	KH	SH
13	Fluid resuscitation	KH	SH
14	Aseptic techniques	SH	D
15	Central venous access	KH	KH
16	Lumbar puncture	KH	SH
17	Pleural tapping	KH	SH
18	Ascites tapping	KH	SH

S.N.	Skill Competencies	Miller's Competency Level	
		At the End of Final Year	At the End of Internship
19	Chest tube insertion	KH	SH
20	Needle thoracostomy	KH	SH
21	Airway maintenance	SH	D
22	Perform CPR using bag and mask	SH	D
23	Endotracheal intubation	KH	D
24	Basic suturing skills	SH	D
25	Incision and Drainage of simple abscess	KH	SH
26	Aspiration of abscess	KH	SH/D
27	Proctoscopy	KH	SH/D
28	Splinting and immobilization	SH	D
29	Urethral catheterization	SH	D
30	NG tube insertion	KH	SH/D
31	X-ray interpretation of common conditions (Pneumonia, pneumothorax, pleural effusion, cardiomegaly, intestinal obstruction, perforation, fractures)	SH	D
32	Stabilizing cervical spine	SH	D
33	Superficial conjunctival foreign body removal	KH	SH/D
34	Simple foreign body removal – ear, nose	KH	SH/D
35	Anterior nasal packing	KH	SH/D
36	Wound care	KH	SH/D
37	Bone marrow aspiration	KH	KH
38	Cardiopulmonary resuscitation (CPR)	SH	D
39	Newborn care/ Neonatal Resuscitation	KH	SH/D
40	Normal delivery	KH	SH/D
41	Episiotomy	KH	SH/D
42	Basic USG	KW	KH
43	Patient counselling	SH	D
44	Medicolegal examination	KH	SH
45	Autopsy	KH	KH
46	Take informed consent for surgery and other procedures under LA/GA	SH	D

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Mr. Saibijaya Rijal	Manamohan Technical University
Salauddin Miya	CIST College
Dr. Samjhana Subedi	Kathmandu Model Hospital, School of Nursing



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Prof. Dr. Sangha Ratna Bajracharya	Medical Education Commission
Dr. Sanjay Kumar Sah	National Medical College
Saraswati Gautam	Maharajgunj Nursing Campus
Saroj Kumar Thakur	Madhesh Institute of Health Sciences, Janakpur
Dr. Saroj Sharma	NAMS, Bir Hospital
Dr. Savyata Gautam	NMCAI
Dr. Shailesh Mani Pokhrel	Purbanchal University
Prof. Dr. Shaili Pradhan	National Academy of Medical Sciences (NAMS)
Prof. Shantalal Shrestha	Maharajgunj Medical Campus
Sharad Pudashaini	Hope International College
Dr. Shishir Gokhle	Manipal College of Medical Sciences
Shiva Ram Shreshta	CTEVT
Dr. Shivaji Paudel	Nepal Medical Council
Prof. Dr. Shivendra Jha	B.P. Koirala Institute of Health Sciences
Prof. Dr. Shreesti Shrestha	Nepal Medical College
Shrijana Paudel	Pokhara Nursing Campus
Prof. Dr. Shrijana Shrestha	Patan Academy of Health Sciences
Subekksha Thapaliya	Norvic
Sudhan Paudel	Koshi Health and Science Campus
Prof. Dr. Sudip Acharya	B.P. Eye Fundation
Prof. Dr. Suraj Bajracharya	KIST Medical College
Sushila Koirala	B.P. Koirala Memorial Cancer Hospital Chitwan
Tapeshwor Yadav	Madan Bhandari Academy of Health Sciences
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