



स्वामी राम हिमालयन विश्वविद्यालय
Swami Rama Himalayan University

Criterion 1 - Curricular Aspects

1.1.1 Outcome Analysis of POs, COs

B. Sc. Medical Technology Operation Theatre (2020-2023)

Himalayan Institute of Medical Sciences

Swami Rama Nagar, Jolly Grant, Dehradun 248016, Uttarakhand, India

A. Program Outcomes

After successful completion of the program, the student will be able to:

PO	Names
PO1	Clinical Care
PO2	Communication
PO3	Membership of a multidisciplinary health team
PO4	Ethics and accountability
PO5	Commitment to professional excellence
PO6	Leadership and mentorship
PO7	Social Accountability and Responsibility
PO8	Scientific attitude and Scholarship
PO9	Lifelong learning




B. Course-wise CO-PO Mapping

Mapping factor or Correlational level between Course Outcome (CO) and Program Outcomes (PO) indicates to what extent the teaching and assessment method of CO correlates/contributes the PO at the level defined below:

Corelation Level	Particulars
3	Substantial/high contribution of CO towards PO
2	Moderate contribution of CO towards PO
1	Slight/low contribution of CO towards PO

Following are the list of courses and the mapping factors between COs and POs:

Course code	Course Name	CO-PO Mapping (Articulation Matrix)								
BOT101	Anatomy, Physiology, and Pharmacology									
Course Outcomes (COs)		PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9
At the end of the course the students will be able to:										
CO 1	Identify and describe anatomical aspects of muscles, bone and joints along with surface landmarks	3	1	1	1			1		1
CO 2	Identify and describe central nervous and peripheral nervous system.	2	2	1	1		1	1		1
CO 3	Understand and analyse movements of upper, lower extremity.	3	2	1	1		1	1	1	1
CO 4	Identify and describe components of thorax, abdomen and cardiopulmonary system	2	2	1	1	1	1	1	1	1
CO 5	Distinguish major arteries veins and lymphatics.	3	2	1	1	1	1	1	1	2
CO 6	Identify the components of various trans-sections.	2	2	1	1	1	1	1	1	1
CO 7	Acquire the knowledge of the relative contribution of each organ system in maintenance of the Homeostasis.	2	1	1		1		1		1



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CO 8	Knowledge of general physiology of cell, blood, nerve and muscle.	3	1	1	1	1	1	1	1	1
CO 9	Describe and discuss physiological effects of acute and chronic exercise and physiology of ageing.	2	2	1	1	2	2	1	1	2
CO 10	Describe and discuss the physiological functions of respiratory, cardiovascular, gastrointestinal and renal, reproductive, endocrine, integumentary and central nervous system.	3	2	1	1	1	1	1	1	1
CO 11	Able to Explain physiological basis of special senses functions.	3	2	1	1	1	1	1	1	1
CO 12	Knowledge of applied physiology.	3	1	1		1			1	1
CO 13	Understand the basis of routes of drug administration based on the characteristics of each route as well as the drug	3	1	2					1	
CO 14	Explain the pharmacological basis of use, the adverse drug reaction and drug interactions of medicines relevant to OT such as Premedication drugs, Induction drug and Analgesics, Local Anaesthetics and Antibiotics.	3		2		1				2
CO 15	Understand the pharmacology of commonly used Emergency medicines	3		2					1	
CO 16	Knowledge about cold chain maintenance of drugs and vaccines	3		2	1		1	1		2
Course-wise PO Average		2.68	1.31	1.25	0.68	0.68	0.68	0.75	0.68	1.12

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1.1.1 Outcome Analysis of POs, COs - BOT (2020-2023)

Course code		Course Name								
BOT102		Pathology, Biochemistry, Microbiology and Patient Care/ Equipment/ Machines								
Course Outcomes (COs)		CO-PO Mapping (Articulation Matrix)								
At the end of the course the students will be able to:		PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9
CO 1	The student should be able to submit the appropriate tissue sections per protocol	2	1	2	3	3		3	1	3
CO 2	Knowledge of the reference ranges for hemoglobin, hematocrit, erythrocytes, and leukocytes in infants, children and adult.	2	2	2	3	3		3	1	3
CO 3	Knowledge in blood transfusion protocols	3	3	3	3	3	1	2	2	3
CO 4	Demonstrate the proper technique of different types of sample collection and their transport.	3	3	2	2	2		2	2	3
CO 5	Identify the five classes of polymeric								2	2
CO 6	Explain how the metabolism of glucose leads ultimately to the generation of large quantities of ATP.	1				1			2	2
CO 7	Describe how fats and amino acids are metabolized, and explain how they can be used for fuel	1				1			2	2
CO 8	Describe liver function tests and renal function tests	3	1	1	1	2			2	2
CO 9	Discuss the significance and disturbance of electrolytes	3	1	1	1	2			2	2
CO 10	Ability to demonstrate knowledge of microorganisms and the disease process	3	2	3	1	3	1		3	3
CO 11	Ability to demonstrate knowledge of aseptic and sterile techniques.	3	2	3	2	3	1		2	3
CO 12	Knowledge of handling biological waste	2		1	2	2		3	2	3
CO 13	Collection of specimens and transport system	3	1	2	3	2	3		2	3

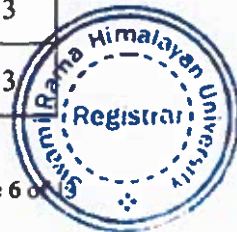
I.1.1 Outcome Analysis of POs, COs - BOT (2020-2023)

CO 14	Perform hand hygiene, scrubbing	3	2	2		2			2	3
CO 15	Knowledge about basic concept of quality of health care , NABH guidelines and overview of history of anaesthesia	2	2	3	2			1		3
CO 16	Knowledge of monitoring device application in operation theatre	2	3	3	3	2	1	1	2	3
CO 17	Demonstrate preoperative check list, and safe transport of patient	1	1	3	3	2	1	3		3
CO 18	Ability to prepare patient for operation theatre, use different attachments of OT table, prepare IV lines and items required	1	2	3	3	2	1	2	2	3
CO 19	Describe handling of sterile items in operation theatre	1	2	3	3	2	1	2	2	3
CO 20	Knowledge of basics of emergency care and life support skills	3	1	3	1	3	1	2	1	3
CO 21	Ability to set the intubation trolley and anaesthesia drug tray	3	3	3	3	2	1	2	2	3
CO 22	Demonstrate ability to take care of patients in different positions under surgery.	3	3	3	3	2		1		3
CO 23	Ability to keep records during anaesthesia	2	2	1	2	1	1	2	1	3
	Course-wise PO Average	2.17	1.60	2.04	1.91	1.95	0.56	1.26	1.60	2.78

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Course code		Course Name								
BOT201		Basic Concepts of Allied Specialities								
Course Outcomes (COs)		CO-PO Mapping (Articulation Matrix)								
At the end of the course the students will be able to:		PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9
CO 1	Knowledge about the role of OT technician in assisting doctors during radiological investigations		3	3		2		2	3	3
CO 2	Describe about shock and assistance in management	3	3	3	3	3	3	3	3	3
CO 3	Detail about the basic concepts in general surgery cases	3	3	2	3	3	2	2	3	3
CO 4	Detail about the basic concepts in plastic surgery cases	3	3	2	3	3	2	2	3	3
CO 5	Detail about the basic concepts in pediatric surgery cases	3	3	2	3	3	2	2	3	3
CO 6	Detail about the basic concepts in neurological surgeries	3	3	2	3	3	2	2	3	3
CO 7	Detail about the basic concepts in orthopedic surgeries	3	3	2	3	3	2	2	3	3
CO 8	Detail about the basic concepts in ENT surgeries	3	3	2	3	3	2	2	3	3
CO 9	Detail about the basic concepts in CTVSI surgeries	3	3	2	3	3	2	2	3	3
CO 10	Detail about the basic concepts in ophthalmic surgeries	3	3	2	3	3	2	2	3	3
CO 11	Detail about the basic concepts in obs and gynae surgeries	3	3	2	3	3	2	2	3	3
CO 12	Knowledge of basic surgical instruments	1	2		2	3	1	2	3	3
CO 13	describe the cleaning of instruments	1	2		2	3	1	2	3	3
CO 14	knowledge about optical instruments and scopes	1	2		2	3	1	2	3	3



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CO 15	describe about use of linen, packing of linen and instrument sets	1	2		2	3	1	2	3	3
CO 16	knowledge about the various types of instrument trolleys and their use	1	2		2	3	1	2	3	3
Course-wise PO Average		2.18	2.68	1.50	2.50	2.93	1.62	2.06	3.00	3.00

Course code	Course Name	CO-PO Mapping (Articulation Matrix)								
BOT202	Clinical Anaesthesiology									
Course Outcomes (COs)		CO-PO Mapping (Articulation Matrix)								
At the end of the course the students will be able to:		PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9
CO 1	Understand the checklist and working of Anaesthesia machine	2	2	3	3		2	2	2	3
CO 2	Describe the medical gas supply.	2	2		2	2		3	2	3
CO 3	Preparation of Various Equipment involved in Anaesthesia	3	2	1	2	3		2	2	3
CO 4	Demonstrate changing of Soda lime canister	3	3	1		3		3	1	3
CO 5	Demonstrate cleaning , sterilization, care and maintenance of Anaesthesia Equipment	3	3	3	3	3	2	3	2	3
CO 6	Understand the anaesthetic requirements in different medical diseases like COPD, Asthma, Diabetes mellitus, Hypertension, Shock, Chronic Kidney disease, Obese, Thyroid disease, Hepatitis, HIV / AIDS	3	2	3	3	3	2	2	2	3
CO 7	Understand the significance of the care of elderly patients, pregnant patients, paediatric and neonates.	3	3	2	2	2	1	3	2	3
CO 8	Have knowledge about the medicines relevant to Operation Theatre	3	2	1	2	3		3		3



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CO 9	Have knowledge about Emergency Medications	3	3	1	2	3	1	3	1	3
CO 10	To understand the role of technician in assisting the anaesthesiologist.	3	3	3	2	2	3	3	2	3
CO 11	Understand and apply the knowledge of types of fluid and therapy	3	1	2	2	2	1	1	1	3
Course-wise PO Average		2.81	2.36	1.81	2.09	2.36	1.09	2.54	1.54	3.00

Course code	Course Name	CO-PO Mapping (Articulation Matrix)										
BOT301	Advanced And Critical Care	Course Outcomes (COs)		PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9
At the end of the course the students will be able to:												
CO 1	Should have knowledge of basics of intensive care of patient	3	2	2	2	3	1	1	2	3		
CO 2	Should have knowledge of invasive and non-invasive monitoring of vital signs and their calibration in OT & ICU, and their care.	2	1	2	2	3	1	2	2	3		
CO 3	Demonstrate skills in basic Physiotherapy techniques, feeding, Ryle's tube insertion. Suctioning, posturing and transport of semiconscious and unconscious patients	3	2	2	2	3	1	1	1	3		
CO 4	Demonstrate maintenance and sterilization of ventilators		3	2	2	2	1	3	1	3		
CO 5	Performs skills in assisting code blue team in ICU- chest compression, Bag mask ventilation, drugs and defibrillators	3	3	3	2	3	1	2	2	3		
CO 6	Demonstrate skills in sample collection for ABG and processing	2	2	2	1	2	1	1	1	3		
CO 7	Demonstrate maintenance of record keeping.	1	3	3	3	2	1	1	1	3		
CO 8	Should be able to maintain Operating room discipline.	1	3	2	3	2	1	1	1	3		



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CO 9	Demonstrate skills in Man Power management and coordinate with Central supply unit, maintain Operating room discipline.	1	3	2	3	2	1	1	1	3
CO 10	Should have knowledge of the different types of fire extinguishers and their uses in different scenario	2	2	2	2	2	1	2	1	3
CO 11	Understand the special concerns and anaesthetic requirements in emergency surgeries, obstetric surgeries, laparoscopic , urological and orthopaedic procedures	3	2	3	3	3	2	3	2	3
CO 12	Should be able to demonstrate the care and maintenance of surgical Equipment, Monitors Optical instruments, ventilators, OT table and light etc	1	2	3	3	3	1	1	1	3
CO 13	Should show skills in preparing OT and maintaining anaesthetic equipment in Cardiothoracic surgeries, Paediatric surgeries and neurological surgeries, Renal Transplant	3	3	2	2	3	2	3	3	3
CO 14	Assisting in fiberoptic intubation	3	2		1	2	2	1	1	3
CO 15	Should have knowledge of Medicolegal aspects of handling Scheduled H drugs	3	2	1	3	2	1	3	1	3
	Course-wise PO Average	2.06	2.33	2.06	2.26	2.46	1.20	1.73	1.40	3.00

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Course code		Course Name								
BOT 3 02		Special Procedures And Sterilization Techniques								
Course Outcomes (COs)		CO-PO Mapping (Articulation Matrix)								
At the end of the course the students will be able to:		PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9
CO 1	Describe about the various procedures in general surgery including incisions	3	3	2	3	3	2	3	3	3
CO 2	Describe about the various procedures in plastic surgery	3	3	2	3	3	2	3	3	3
CO 3	Describe about the various procedures in pediatric surgery	3	3	2	3	3	2	3	3	3
CO 4	Describe about the various procedures in neurosurgery	3	3	2	3	3	2	3	3	3
CO 5	Describe about the various procedures in orthopedics	3	3	2	3	3	2	3	3	3
CO 6	Describe about the various procedures in ENT surgery	3	3	2	3	3	2	3	3	3
CO 7	Describe about the various procedures in obs and gynae surgery	3	3	2	3	3	2	3	3	3
CO 8	Describe about the various procedures in CTVS	3	3	2	3	3	2	3	3	3
CO 9	Detail sterilization techniques	3	3		3	3		2	3	3
CO 10	Detail CSSD matters	3	3		3	3		2	3	3
Course-wise PO Average		3.00	3.00	1.60	3.00	3.00	1.60	2.80	3.00	3.00



C. Program outcome Average Reference Value:

Following table calculates the overall average of all POs correlation values of the Courses and is referred as average PO Reference values.

Sr. No.	Course Code	Course Title	Course-wise PO Average values								
			PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9
1	BOT101	Anatomy, Physiology And Pharmacology	2.68 8	1.31 3	1.25 0	0.68 8	0.68 8	0.68 8	0.75 0	0.68 8	1.12 5
2	BOT102	Pathology, Biochemistry, Microbiology And Patient Care/ Equipment/ Machines	2.17 4	1.60 9	2.04 3	1.91 3	1.95 7	0.56 5	1.26 1	1.60 9	2.78 3
3	BOT201	Basic Concepts Of Allied Specialities	2.18 8	2.68 8	1.50 0	2.50 0	2.93 8	1.62 5	2.06 3	3.00 0	3.00 0
4	BOT202	Clinical Anaesthesiology	2.81 8	2.36 4	1.81 8	2.09 1	2.36 4	1.09 1	2.54 5	1.54 5	3.00 0
5	BOT301	Advanced And Critical Care	2.06 7	2.33 3	2.06 7	2.26 7	2.46 7	1.20 0	1.73 3	1.40 0	3.00 0
6	BOT302	Special Procedures And Sterilization Techniques	3.00 0	3.00 0	1.60 0	3.00 0	3.00 0	1.60 0	2.80 0	3.00 0	3.00 0
Combined Average Score of Program			2.48	2.21	1.71	2.07	2.23	1.12	1.85	1.87	2.65



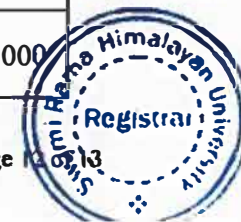
D. Assessment of Program Outcome and Attainment Value

The attainment of the course outcome is measured at the level of 3 as follows:

Attainment Levels	Criteria
3	If 80% of student achieves marks greater than threshold percentage of the total score of assessment
2	If 70% of student achieves marks greater than threshold percentage of the total score of assessment
1	If 60% of student achieves marks greater than threshold percentage of the total score of assessment
0	If 60% of student achieves marks less than threshold percentage of the total score of assessment

Attainment level of COs is measured through direct attainment of COs depending on the performance of the students in Internal Assessment (IA) and University Examination (UE) individually. The average attainment level of both assessment is calculated depending on the proportional weightage of IA and UE according to the academic regulation or marks distribution of the assessment. For this program the threshold percentage is set at 50% for IA and 50% for UE Assessments.

Sr. No.	Course Code	Course Title	Attainment of COs	Derived Attainment of POs Course-wise								
				PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9
1	BOT101	Anatomy, Physiology And Pharmacology	2.300	2.061	1.007	0.958	0.527	0.527	0.527	0.575	0.527	0.863
2	BOT102	Pathology, Biochemistry, Microbiology And Patient Care/ Equipment/ Machines	3.000	2.174	1.609	2.043	1.913	1.957	0.565	1.261	1.609	2.783
3	BOT201	Basic Concepts Of Allied Specialities	2.700	1.969	2.419	1.350	2.250	2.644	1.463	1.857	2.700	2.700
4	BOT202	Clinical Anaesthesiology	3.000	2.818	2.364	1.818	2.091	2.364	1.091	2.545	1.545	3.000



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5	BOT301	Advanced And Critical Care	3.000	2.067	2.333	2.067	2.267	2.467	1.200	1.733	1.400	3.000
6	BOT302	Special Procedures And Sterilization Techniques	2.800	2.800	2.800	1.493	2.800	2.800	1.493	2.613	2.800	2.800
Average PO Achievement Through Results				2.315	2.089	1.622	1.975	2.127	1.057	1.764	1.764	2.524
Average PO Reference values				2.489	2.218	1.713	2.077	2.236	1.128	1.859	1.874	2.651
Percentage Attainment of PO's				93%	94%	95%	95%	95%	94%	95%	94%	95%

From the Attainment level of CO, the Derived PO's value for course is calculated as follows:

$$\text{Derived PO Value} = \frac{\text{CO attainment} \times \text{respective PO average}}{3}$$

Depending on derived PO values of the courses, calculate the average PO achievement for each PO.

Calculate the percentage attainment of PO's as follows:

$$\text{Percentage attainment of PO's} = \frac{\text{Average PO Attainment through}}{\text{average PO refrence value}} \times 100$$

