RAMAIAH UNIVERSITY OF APPLIED SCIENCES

Programme Structure and Course Details of B.Sc. (Hons) in Anaesthesia and Operation Theatre Technology 2022-2023

Programme Code: 403

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M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054

Faculty of Life and Allied Health Sciences
Ramaiah University of Applied Sciences
Department of Allied Health Sciences

DEAN
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BANGALORE-560 054

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University's Vision, Mission and Objectives

The M. S. Ramaiah University of Applied Sciences (MSRUAS) will focus on student-centric professional education and motivates its staff and students to contribute significantly to the growth of technology, science, economy and society through their imaginative, creative and innovative pursuits. Hence, the University has articulated the following vision and objectives.

Vision

MSRUAS aspires to be the premier university of choice in Asia for student centric professional education and services with a strong focus on applied research whilst maintaining the highest academic and ethical standards in a creative and innovative environment

Mission

Our purpose is the creation and dissemination of knowledge. We are committed to creativity, innovation and excellence in our teaching and research. We value integrity, quality and teamwork in all our endeavors. We inspire critical thinking, personal development and a passion for lifelong learning. We serve the technical, scientific and economic needs of our Society.

Objectives

1. To disseminate knowledge and skills through instructions, teaching, training, seminars, workshops and symposia in Engineering and Technology, Art and Design, Management and Commerce, Health and Allied Sciences, Physical and Life Sciences, Arts, Humanities and Social Sciences to equip students and scholars to meet the needs of industries, business and society
2. To generate knowledge through research in Engineering and Technology, Art and Design, Management and Commerce, Health and Allied Sciences, Physical and Life Sciences, Arts, Humanities and Social Sciences to meet the challenges that arise in industry, business and society
3. To promote health, human well-being and provide holistic healthcare
4. To provide technical and scientific solutions to real life problems posed by industry, business and society in Engineering and Technology, Art and Design, Management and Commerce, Health and Allied Sciences, Physical and Life Sciences, Arts, Humanities and Social Sciences
5. To instill the spirit of entrepreneurship in our youth to help create more career opportunities in the societyby incubating and nurturing technology product ideas and supporting technology backed business
6. To identify and nurture leadership skills in students and help in the development of our future leaders to enrich the society we live in
7. To develop partnership with universities, industries, businesses, research establishments, NGOs, international organizations, governmental organizations in India and abroad to enrich the experiences of faculties and students through research and developmental programmes

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Programme Specifications : B.Sc. (Hons) in Anesthesia and Operation Theatre Technology

Faculty	Life and Allied Health Sciences
Department	Anesthesia and Operation Theatre Technology
Programme Code	403
Programme Name	B.Sc. (Hons) in Anaesthesia and Operation TheatreTechnology
Dean of the Faculty	Dr. Krishnamurthy J
Head of the Department	Dr. Tushar Shaw

1. **Title of the Award :** B.Sc. (Hons) in Anaesthesia and Operation Theatre Technology
2. **Mode of Study** : Full-Time
3. **Awarding Institution/Body:** M.S. Ramaiah University of Applied Sciences
4. **Joint Award**: Not Applicable
5. **Teaching Institution:** Department of Anesthesia and Operation Theatre Technology, Faculty of Life and Allied Health Sciences, M.S. Ramaiah University of Applied Sciences, Bangalore
6. **Date of Programme Specifications:**
7. **Date of Programme Approval by the Academic Council of MSRUAS:**
8. **Next Review Date:**
9. **Programme Approving Regulating Body and Date of Approval:**
10. **Programme Accredited Body and Date of Accreditation:**
11. **Grade Awarded by the Accreditation Body:**
12. **Programme Accreditation Validity:**
13. **Programme Benchmark:**
14. **Rationale for the Programme**

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There is a vast scope and need for the allied health professionals in India as well as in other developingcountries. In modern operation theatres anaesthetist and surgeons are utilising a variety of electrical and electronic equipment for monitoring anaesthesia and surgical procedures. The successful patient outcome largely depend on the reliable and smooth performance of these equipments and skilled technologist to operate the same which are in acute short supply.

Therefore, an operation theatre (OT) technologist forms an integral part of the operation theatre in any hospital and facilitates the surgical procedures, by preparing in the equipment that are necessary forany surgical procedures. He/she also looks after all the work and management of the operation theatre which includes managing the patients in and out of operation theatre, looking after all the surgical equipment, arrangement of operation theatre table,

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dressing table, anaesthesia table as well as management of the staff. The technologist is trained in various surgical branches such as General Surgery, OBG, Cardiac, Orthopaedics and Urology.

This innovative competency based curriculum is adopted from the guidelines published by Ministry ofHealth and Family Welfare, allied health Section 2015- 2016.
A competency-based program focuses on blend of skills and knowledge based on the needs of thecommunity. The main competencies that have been identified as essential in an allied health care professional are clinical knowledge, patient care and communication approaches, which is then developed to teach relevant content across a range of courses and settings.

The curriculum is outcome based and focuses on required theoretical concepts and practical skills in thedomain. By undergoing this programme, students develop critical, analytical thinking and problem solving abilities for a smooth transition from academic to real-life work environment. Students do one year internship in the hospitals for skill development abilities to work in a team to enhance practical skills and problem solving abilities. The students are required to submit a well written project report as partial fulfilment for the award of the degree, which will help develop skills of documenting scientific work. In addition students are trained in communication skills and interdisciplinary topics to enhance their scope. The various new features such as foundation courses, early clinical exposure, bioengineering courses, major specialisation, open electives and one year of internship make the students more versatile generating wide range of opportunities including registering for Masters in operation theatre technology. Advanced teaching and learning resources, and experience of the faculty members with their strong connections with health care industry and research organizations makes thisprogramme unique.

For global mobility and acceptability of the graduates, the current curriculum structure is divided into smaller sections with focus on hours of studying that are converted into credit hours as per the international norms followed by various countries Integrated structure of the curriculum
This competency based curriculum follows horizontal and vertical integration between disciplines; andbridges the gaps between both theory and practice, and between hospital-based practice and community practice.

15. Programme Mission

The purpose of the programme is creation of knowledgeable human resources to work in government,semi-government, private and public sector owned hospitals and health care organizations and also toassume administrative positions. With further progression in education, graduates should be able to undertake teaching and research in colleges and universities as well as in scientific organizations.

16. Graduate Attributes

GA-1.Ability to apply fundamental knowledge of Biology, Chemistry, Mathematics, Statistics andcomputer to solve real life problems in their chosen domain
GA-2.Ability to perform administrative duties in government, semi-government, private and publicsector organizations
GA-3. Ability to teach in schools, colleges and universities with additional qualification and training
GA-4. Ability to understand and solve scientific problems by conducting experimental investigations
GA-5. Ability to apply appropriate tools, techniques and understand utilization of resources appropriately in various Laboratories
GA-6.Ability to apply basic programming concepts in their chosen domains
GA-7.Ability to understand the effect of scientific solutions on legal, cultural, social and public health and safety aspects
GA-8.Ability to develop sustainable solutions and understand their effect on society and environment
GA-9.Ability to apply ethical principles to scientific practices and professional responsibilities
GA-10. Ability to work in a team, to plan and to integrate knowledge of various disciplines and to leadteams in

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multidisciplinary settings

GA-11. Ability to effectively convey scientific ideas and concepts to a broad audience using both writtenand verbal means

GA-12. Ability to adapt to the changes and advancements in science and engage in independent and life-long learning

17. Programme Outcomes (POs)

B.Sc. (Hons)_ Anesthesia and Operation Theatre Technology graduates will be able to:

PO 1. Clinical care at Operation Theatre: Provide quality patient care throughout the operative process and is constantly on watchfulness for upholding of the sterile field

PO 2. Communication: Use effective communication skills including listening skill to ensure any work done during surgery is informed to Surgeon, Anaesthetist and other team members

PO 3. Team work: Develop high value on effective understanding within the team, including transparency aboutaims, decisions, problems and mistakes

PO 4. Ethics: Describe and apply ethics related to surgical cases, drug administration and situation

PO 5. Commitment to professional excellence: Supervise the circumstance in the operating room and continually measure the requirement of patient and surgical team

PO 6. Leadership: Take a leadership role to coordinate, delegate and supervise to ensure every single process in operation theatre is secure and flourishing as possible

PO 7. Social Accountability & Responsibility: Demonstrate knowledge of the determinants of health at local,regional and national levels and respond to the population needs

PO 8. Lifelong Learning: Describe and demonstrate use of new technologies and operate equipment used for anaesthesia and surgery.

18. Programme Goal

The programme acts as a specialised course and helps to develop critical, analytical and problem solvingskills at first level. This foundation degree makes the graduates employable in health care organizations and also to assume administrative positions in various types of organizations. The students can progressto pursue a career in academics or health care industry or as a researcher.

19. Programme Education Objectives

PEO -1: Knowledgeable and technically competent in anaesthesia &Surgery discipline in line with Operation Theatre requirements

PEO -2: Effective in communication and demonstrate good leadership quality in Health care facility.

PEO -3: Capable to solve technical problems arising in operation theatre & ICU and also during emergencies withethics and moral values through sustainable approach

PEO -4: Committed to continuous improvement in skills and knowledge harnessing modern tools and technologyused in anaesthesia and surgery.

20. Programme Structure Outcomes (PSOs)

At the end of the **BSc (Hons) Anaesthesia and Operation Theatre Technology** Programme the graduate will beable to:

PSO-1: Apply knowledge of anaesthesia and surgical techniques to provide safe and effective care to thepatients for achieving professional excellence.

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PSO-2: Adapt to the technological advancement in operation theatres by upgrading to the latest practices in the field of operation theatre technology.

PSO-3: Demonstrate the leadership qualities and strive for the betterment of organization, environment andsociety.

PSO-4: Demonstrate an understanding of the importance of lifelong learning through professional development,practical training and specialized certifications.

21. Programme Structure:

SEMESTER 1

S.NO.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total credits	Max. Marks
1	AHD101A	General Anatomy	2	0	2	3	100
2	AHD102A	General Physiology	2	0	2	3	100
3	AHD103A	HCDS	2	0	0	2	50
4	AHD104A	General Microbiology	2	0	2	3	100
5		Language-1(1)	3	0	0	3	100
6	AHM101A	Digital fluency	1	0	2	2	50
Total			12	0	08		
Total number of contact hours per week			20				

SEMESTER 2

S.NO.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total credits	Max. Marks
1	AHD107A	General Biochemistry	2	0	0	2	50
2	AHD108A	General Pharmacology	2	0	0	2	50
3	AHD109A	Concepts of Hospital infection prevention	2	0	0	2	50
4	AHD110A	General Pathology	2	0	2	3	100
5	AHD111A	Environmental Science and Health	2	0	0	2	50
6	AHM113A	Health & wellness	0	0	2	2	50
7	AHD112A	Early Clinical Education	0	0	20	10	100
		TOTAL	10	0	24	23	450
Total number of contact hours per week			34				

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SEMESTER 3

S.NO.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total credits	Max. Marks
1	AOC201A	Clinical Pharmacology	2	0	0	2	50
2	AOC202A	Principles of Anaesthesia	2	0	2	3	100

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3		Open Electives -1	2	0	0	2	50
4	AHN202A	Language – 2 (3)	3	0	0	3	100
5	AHM203A	SEC-2: AI or some other SEC	1	0	2	2	50
6	AHM204A	Entrepreneurship	1	0	2	3	100
7	AOC203A	Studentship (Directed Clinical Education) 1	0	0	12	6	100
		TOTAL	11	0	18	21	550
Total number of contact hours per week			29				

SEMESTER 4

S.NO.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total credits	Max. Marks
1	AOC204A	Basics of surgical procedures	2	0	0	2	50
2	AOC205A	Basic Techniques of Anaesthesia	2	0	2	3	100
3		Open Electives -1	2	0	0	2	50
4	AHN203A	Constitution of India	3	0	0	3	100
5	AHN204A	SEC-3: Professional communication	1	0	2	2	50
6	AHN307A	Ethics & self-awareness	1	0	2	3	100
7	AHN206A	NCC/NSS/R&R(S&G)/ Cultural	0	0	12	6	100
8	AOC206A	Studentship (Directed Clinical Education) 2	11	0	18	21	550
			9	2	18	20	550
Total number of contact hours per week			29				

SEMESTER 5

S.NO.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total credits	Max. Marks
1	AOC301A	Advance Anaesthetic techniques	2	1	2	4	100
2	AOC302A	Basic Intensive Care	2	1	2	4	100
3	AOC303A	CSSD	2	0	0	2	50
4	AOC304A	Basic Medical Procedure & Techniques	2	1	2	4	100
5	AHN306A	SEC-4: Cyber Security or some other SEC	1	0	2	2	50
6	AHM305A	Project Management	2	0	2	2	50
7	AHN205A	Sports	1	0	2	2	50

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8	AOC305A	Studentship (Directed Clinical Education) 3	0	0	8	4	100
		TOTAL	12	3	24	24	600
Total number of contact hours per week			39				

SEMESTER 6

S.NO.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total credits	Max. Marks
1	AOC306A	Specialized surgery	3	1	2	5	150
2	AOC307A	Anaesthesia for specialised surgery	4	1	2	6	150
3	AOC308A	Research Methodology	1	0	2	3	50
4	AHN308A	SEC-4: Personality Development and Soft Skill	0	0	2	2	50
5	AOC309A	Studentship (Directed Clinical Education) 4	0	0	16	8	100
		TOTAL	8	2	24	24	500
Total number of contact hours per week			34				

SEMESTER 7

S.NO.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total credits	Max. Marks
1	AOP401A	Research Project	0	0	20	10	100
2	AOI401A	Internship	0	0	20	10	100
3			0	0	40	20	200
Total number of contact hours per week			40				

SEMESTER 8

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S.NO.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total credits	Max. Marks
1	AOP402A	Research Project	0	0	20	10	100
2	AOI402A	Internship	0	0	20	10	100
3			0	0	40	20	200
Total number of contact hours per week			40				

Note: The Vacations and other activities shall be as per the Time-Table for the corresponding batch.

22. Ability and Skill Enhancement Courses

- **Ability Enhancement Compulsory Courses (AECC)**

  AECC courses are the courses based upon the content that leads to knowledge enhancement through various areas of study, which will be mandatory for all disciplines:

  1. Language and Literature
  2. Environmental Science and Sustainable Development/ Environmental Studies
  3. Constitution of India and Human Rights, Human rights
  4. Project Management
  5. Competitive Exam Training

- **Skill Enhancement Courses (SEC)/ Vocational Courses**: These are skill-based courses in all disciplines and are aimed at providing hands-on-training, competencies, skills, etc. SEC courses may be chosen from the pool of courses designed to provide skill-based instruction:

  1. Digital Fluency
  2. Artificial Intelligence & ML
  3. Cyber Security
  4. Professional Communication
  5. Industry visit/ Vocational Course
  6. Internship/training
  7. Innovation and Enterpreneurship

- **Value Added courses**: These courses are value-based courses which are meant to inculcate ethics, culture, soft skills, sports education and such similar values to students which will helpinall round development of students.

  1. Health & Wellness/ Social & Emotional Learning
  2. Sports/ Yoga/NCC/NSS
  3. Ethics & Self Aware-ness

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- **Open Elective Courses:**

  A number of Open Elective Courses from various Faculties of RUAS are offered as mentioned in the University's website. Students can choose the Open Electives of their choice. The students are permitted to choose online electives from the list approved by the respective HoD and Dean.

- **Innovation Courses in Lieu of Open Elective Courses**

  Students can earn 3-credits by participating in innovation activities as per the approved guidelinesin lieu of Open Elective Courses. The activities could be related to any of the following:

  a) Design Thinking and Innovation
  b) Skill Development
  c) Industrial Problem Solving and Hackathons

23. Course Delivery :As per the Time-Table.

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24. Teaching and Learning Methods

1. Face to Face Lectures using Audio-VisualS
2. Workshops, Group Discussions, Debates, Presentations
3. Demonstrations
4. Guest Lectures
5. Laboratory work/Field work/Workshop
6. Industry Visit
7. Seminars
8. Group Exercises
9. Project Work 10.Project Exhibitions
10. Technical Festivals

25. Major Features

i. 4th year option will be offered in all B.Sc. programs for those who qualify (with 7.5 CGPA after completion of 3rd year)

ii. 1st year: Certificate
iii. 2nd year: Diploma
iv. 3rd year: Bachelors or Bachelor (Honors)
v. 4th year: Bachelor (Honors with Research)

26. Assessment and Grading (Subject to endorsement of revised unified academic regulations for2022-23-report submitted)

26.1 Components of Grading

There shall be **two components** of grading in the assessment of each course:

Component 1, Continuous Evaluation (CE): This component involves multiple subcomponents (SC1, SC2, etc.) of learning and experiential assessment. The assessment of the subcomponents ofCE is conducted during the semester at regular intervals. This subcomponent represents the formative assessment of students' learning.

Component 2, Semester-end Examination (SEE): This component represents the summative assessment carried out in the form an examination conducted at the end of the semester.

Marks obtained CE and SEE components have 60:40 weightage (CE: 60% and SEE: 40%) in determining the final marks obtained by a student in a Course.

The complete details of Grading are given in the Academic Regulations.

26.2 Continuous Evaluation Policies

Continuous evaluation depends on the type of the course as discussed below:

26.2.1 Theory Courses

For Theory Courses Only
Focus of COs on each Component or Subcomponent of Evaluation

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	Component 1: CE (60% Weightage)		Component 2: SEE (40% Weightage)
Subcomponent Type ▸	Terms Tests	Assignments	
CO-1			
CO-2			
CO-3			
CO-4			
CO-5			
CO-6			
The details of number of tests and assignments to be conducted are presented in the Academic Regulations and Programme Specifications Document.			

- CE components should have a mix of term tests, quiz and assignments
- Two Tests (15 each), Two Assignments (20 marks). (One written and another to beMCQs)
- Course leaders to declare the assessment components before the commencementof the session and get approval from HoD and Dean

26.2.2 Laboratory Course

For a laboratory course, the scheme for determining the CE marks is as under:

For Laboratory Courses Only			
Focus of COs on each Component or Subcomponent of Evaluation			
	Component 1: CE (60% Weightage)		Component 2: SEE (40% Weightage)
Subcomponent Type ▸	Conduct of Experiments	Laboratory Report + Viva	Laboratory SEE
CO-1			
CO-2			
CO-3			
CO-4			
CO-5			
CO-6			
The details of number of tests and assignments to be conducted are presented in the Academic Regulations and Programme Specifications Document			

The subcomponents can be of any of the following types:

- Laboratory / Clinical Work Record
- Experiments
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other (e.g. combinations)

Course leaders to declare the assessment components before the commencement of thesession and get approval from HoD and Dean

26.2.2 Course Having a Combination of Theory and Laboratory

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For a course that contains the combination of theory and laboratory sessions, thescheme for determining the CE marks is as under:

For Combined Courses (Theory + Laboratory)					
Focus of COs on each Component or Subcomponent of Evaluation					
Course Outcome	CE (Weightage: 60 %) Four components including one Lab component			SEE (Weightage: 25 %)	Lab (Weightage: 15 %)
	Tests (30 %)	Written Assignments+ Lab (20 %)	Assignment +Lab CE (10%)	Written exam	LSEE: SEE
CO-1					
CO-2					
CO-3					
CO-4					
CO-5					
CO-6					
The details of number of tests and assignments to be conducted are presented in the Academic Regulations and Programme Specifications Document.					

- CE components should have a mix of term tests, quiz and assignments
- Two Tests (15 each), Two Assignments (20 marks). (One written and another to be MCQs)
- In case of courses where laboratory is combined with theory, laboratory components to be assessed inboth CE and SEE
- Course leaders to declare the assessment components before the commencement of the session and get approval from HoD and Dean

26.2.3 Ability Enhancement courses

For AECC Only		
Focus of COs on each Component or Subcomponent of Evaluation		
	Component 1: CE (60% Weightage)	Component 2: SEE (40% Weightage)
Subcomponent Type ▸	Terms Tests or Assignments	
CO-1		
CO-2		
CO-3		
CO-4		
CO-5		
CO-6		
The details of number of tests and assignments to be conducted are presented in the Academic Regulations and Programme Specifications Document.		

- Course leaders to declare the assessment components before the commencement of the sessionand get approval from HoD and Dean

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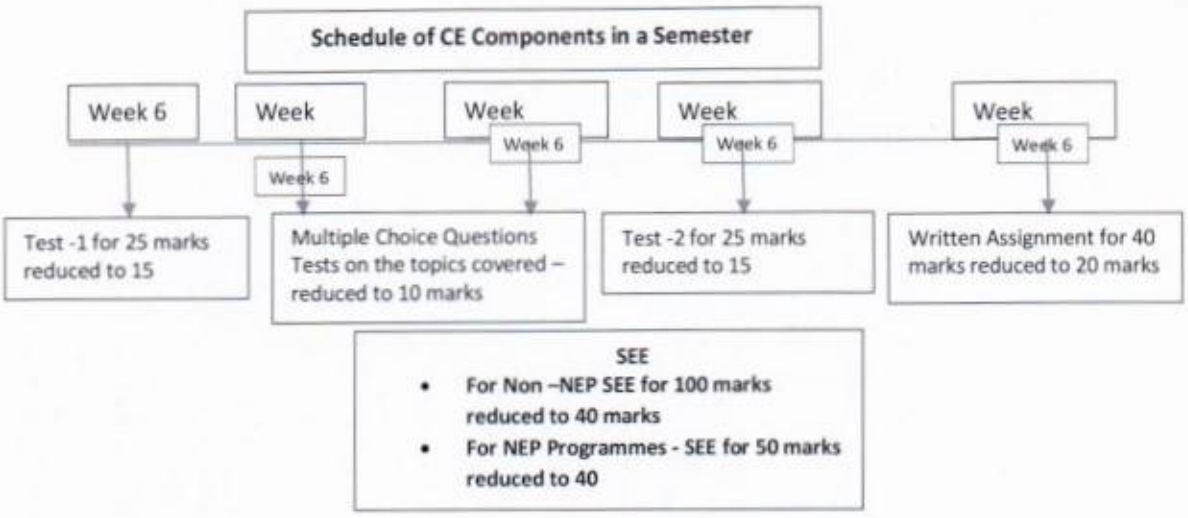

After all the subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage.The Semester End Examination shall be a 90 minutes theory paper of 50 marks with a weightage of 40% in case of theory courses. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

1. **Student Support for Learning**
    1. Course Notes
    2. Reference Books in the Library
    3. Magazines and Journals
    4. Internet Facility
    5. Computing Facility
    6. Laboratory Facility
    7. Staff Support

2. **Quality Control Measures**
    1. Review of Course Notes
    2. Review of Question Papers and Assignment Questions
    3. Student Feedback
    4. Moderation of Assessed Work
    5. Opportunities for students to see their assessed work
    6. Review by external examiners and external examiners reports
    7. Staff Student Consultative Committee meetings
    8. Student exit feedback
    9. Subject Assessment Board (SAB)
    8. Programme Assessment Board (PAB)

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29. Curricular Map

Sem	Course Title	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8					PSO-1	PSO-2	PSO-3	PSO-4
1	General Anatomy	3	1	2			1									3	3
1	General Physiology	2		1	1	1								2			
1	HCDS	1	1	1	2	1		2	1					2			1
1	General Microbiology		2	1		2	2	2	1					2		1	1
1	Language – 1 (1)																
1	Digital fluency																
2	General Biochemistry	3			2	2								3			1
2	General Pharmacology	1	1	2	2	2	1	2	1					2		1	1
2	Concepts of Hospital infection prevention	2		1	1	2			1					2		1	
2	General Pathology	3	1	1		3	1		1					3		1	
2	Environmental Science and Health				3												2
2	Health & Wellness/Social & Emotional Learning	3	1	1		2								3			
2	Early Clinical Education	2	1	2	2										2		2
3	Clinical Pharmacology	3	2	2	1	1	1	1	1					3	2		1
3	Principles of Anaesthesia	3		2		1			2					3	2		1
3	Open Elective -1																
3	Language – 2 (2)																
3	SEC-2: AI or some other SEC																
3	Entrepreneurship	3		2	2				2					3	2	2	2
3	Studentship 1	3	3	2	1	1	1	1	1					3	2		1
2	Sports	1	3				1									1	
4	Basics of surgicalprocedures	3	1	1		1	1		1					3	1	1	1
4	Basic Techniques of Anaesthesia	3	3	2	2	2	2		1					3	2	2	1
4	Open Elective – 2																
4	Constitution of India	2		1	1		1	3	1					2	1	3	1
4	Professional Communication																
4	Sports	1	3				1									1	
4	NCC/NSS/R&R(S&G)/ Cultural																
4	Studentship 2	1	2	2		1	1		1					3	2	1	1
5	Advance Anaesthetic techniques	3	1	1	2	2	1		1					3	3	1	1

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5	Basic Intensive Care	3	2	1	2	2	1		1					3	3	1	1
5	CSSD	3	2	1	2	2	1		1					3	3	1	1
5	Basic Medical Procedure & Techniques	3	2	1	2	2	1		1					3	3	1	1
5	SEC-4: Cyber Security or some other SEC																
5	Project management		2	1											1		2
5	Ethics & Self Awareness																
5	Studentship 3	3	3	3	3	3	2		2					3	3	2	2
6	Specialized surgery	3	3	3	3	3	2		2					3	3	2	2
6	Studentship 4	3	3	2	2	2	1		1					3	2	1	1
6	Anaesthesia for specialised surgery	3	2	1	1		1		1					3	2		1
6	Soft Skills & personality development		3	1										2	2	1	1
6	Research Methodology	3	1	1	2	2	1		1					3	3	1	1
7	Research Project	3	3	2	2	2	1		1					3	2	1	1
7	Internship	3	3	2	2	2	1		1					3	2	1	1
8	Research Project	3	3	2	2	2	1		1					3	2	1	1
8	Internship	3	3	2	2	2	1		1					3	2	1	1
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution																	

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30. Co-curricular Activities

Student are encouraged to take part in co-curricular activities like seminars, conferences, symposium, paper writing, attending industry exhibitions, project competitions and related activities for them to enhance their knowledge and network

31. Cultural and Literary Activities

To unwind and ignite the creative endeavors annual cultural festivals are held and students are encouraged to plan and participate in cultural and literary activities.

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SEMESTER 1

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Course Specifications: General Anatomy

Course Title	General Anatomy
Course Code	19AHG101A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

1. Course Summary

2. The course aims to impart basic knowledge of general human anatomy which forms thebasis for understanding other related subjects such as physiology, pathology and surgery.Emphasis will be placed on cell structure and functions. The various basic tissues of the body, their structure and functional co-relation will be taught. Formation of gametes andearly development of the human fetus will be dealt with in short. Various organ systems,their components and basic functions will be covered under this course.

3. Course Size and Credits:

Number of Credits	03
Total Hours of Classroom Interaction	30
Number of Practical/tutorial Hours	15
Number of Semester Weeks	16
Department Responsible	Allied Health Sciences
Course Marks	Total Marks: 100 As per the Academic Regulations
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

4. Course Outcomes (COs)

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

CO 1. Describe the structure and functional organization of a basic human cell andthe normal anatomical positions and planes of the body

CO 2. Explain the structure and functions of basic tissues.

CO 3. Explain the components of the organ systems and its basic functions

CO 4. Identify the parts of a compound microscope and differentiate microscopy ofbasic tissues

CO 5. Demonstrate the parts and position of bones in the human body and earlydevelopment of fetus

CO 6. Demonstrate the surface anatomy of structures and interpret data obtained from various imaging techniques.

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5. Course

Contents Theory

Introduction

- Introduction to the human body as a whole
- Anatomical terms, planes and positions

The cell: Structure, function and multiplication

Tissues

- Types, structure, characteristics, functions
- Simple and Compound Epithelium
- Connective tissue
- Cells, fibers and types

Cartilage, Blood vessels, Muscle, Bone, Nervous tissue, Skin and SalivaryGlands

Embryology

Fertilization and General embryology

Osteology

- Axial skeleton (Skull : Cranium, air sinuses, Vertebral column: regions, movements and characteristics, Sternum, Ribs)Appendicular skeleton (Bones involving Shoulder girdle and Upper limb, Pelvic girdle and lower limb, healing of bones: cellular activity, Factors that delay healing, Diseases of bonesand joints)

Development of bone and stages of ossification

Organ systems

- Musculoskeletal system
- Digestive system
- Respiratory system
- Circulatory system
- Excretory system
- Nervous system
- Integumentary system
- Endocrine system

Lymphoid system

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Practical

- Histology of epithelium
- Histology of Connective tissue
- Histology of cartilage
- Histology of bone
- Histology of muscle
- Histology of nervous tissue
- Histology of blood vessels
- Histology of skin
- Histology of Salivary glands
- Demonstration of embryology models

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- Demonstration of bones Surface anatomy of all organ system

Interpretation of Radio images

5. CO-PO PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO-1		1	2			1										
CO-2		1	2			1										
CO-3	3	1	2			1									3	3
CO-4		1	2			1										
CO-5		1	2			1										
CO-6	3	1	2			1									3	3
		3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution														

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6. Course Teaching and Learning Methods:

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		14
Demonstrations		
1. Demonstration using Videos		
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop / Course/Workshop / Kitchen		
4. Clinical Laboratory	15	15
5. Hospital		
6. Model Studio		
Others		
1. Case Study Presentation	05	
2. Guest Lecture		
3. Industry / Field Visit		1
4. Brain Storming Sessions		6
5. Group Discussions	10	
6. Discussing Possible Innovations	01	
Term Test and Written Examination		10
Total Duration in Hours		55

7. Method of Assessment

The components and subcomponents of course assessment are presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well. The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

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Focus of Course Learning Outcomes in each component assessed					
	CE (60% Weightage)			SEE (40% Weightage)	
	SC1 (Term Tests)	SC2 (Innovative assignment)	SC3 (Written Assignment)	SEE (Theory) 25%	SEE (Lab) 15%
	(20 Marks)	20 Marks	20 Marks	50 Marks	30 Marks
CO-1	X	X		X	
CO-2	X	X		X	
CO-3	X		X	X	
CO-4			X	X	
CO-5		X			X
CO-6		X	X		X
CO-7			X		X

8. Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the followingteaching and learning methods:

S.No	Curriculum and Capabilities Skills	How imparted during the course
1	Knowledge	Class room lectures
2	Understanding	Class room lectures
3	Critical Skills	Class room lectures
4	Analytical Skills	Group discussion
5	Problem Solving Skills	Case discussions
6	Practical Skills	Case discussions
7	Group Work	case study and group discussions
8	Self-Learning	Seminars
9	Written Communication Skills	Examination
10	Verbal Communication Skills	Group discussions
11	Presentation Skills	Seminars, Case discussions
12	Behavioral Skills	Group discussion, Case discussions
13	Information Management	Case discussions
14	Personal Management	Group discussions
15	Leadership Skills	Group discussions

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9. Course Resources

a. Essential Reading

BD Chaurasia; 2015; **Handbook of General Anatomy**, 5th Edition; CBS Publishing.

IB Singh; 2016; **Textbook of Human Histology**, 8th Edition; Jaypee Brothers Medical Publishers. IB Singh; 2017; **Human Embryology**, 11thEdition; Jaypee Brothers Medical Publishers.

General Anatomy and Physiology – by DrVenkatesh

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Surface and Radiological Anatomy- with a Clinical Perspective- by DrAshwini C A, 1st Edition, Jaypee Publishers, New Delhi

b. Recommended Reading

10. Anne Waugh, Allison Grant; 2018; Ross & Wilson **Anatomy and Physiology in Health and Illness**,13th edition; Elsevier Churchill Livingstone.
11. Adam W.M. Mitchell, Richard Drake, A. Wayne Vogl; **Gray's anatomy for Students**; 3rd edition;Elsevier Churchill Livingstone.

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Course Specifications: General physiology

Course Title	General Physiology
Course Code	19AHG102A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

The course aims to impart basic knowledge and sufficient exposure to the physiological concepts and principles with emphasis on applied aspects of organ systems in the body, and to provide the foundations needed for furtherstudies in pharmacology, pathology, pathophysiology and medicine.
The mechanisms of deranged function will be appreciated with an in-depth understanding of basic biophysical andphysiological mechanisms. The purpose of developing these core competency criteria is to provide guidelines for the breadth and depth of knowledge in the physiological principles and concepts that are considered minimal and essential for further progress in understanding mechanisms of disease and body defenses.

2. Course Size and Credits:

Number of credits	03
Total Hours of Classroom Interaction	30
Number of laboratory Hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 100 As per the Academic Regulations
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

3. Course Outcomes (COs)

After undergoing this course students will be able to:
CO1. Describe the functions of the organ systems in the body
CO2. Explain the mechanisms for the execution of these functions for homeostasis through the secretions of chemical and humoral factors
CO3. Explain the regulatory mechanisms in the control of blood pressure, urine formation maintenance of extracellular and intracellular volume
CO4. Perform to assess the normal values and parameters of the bodily function indicators such as blood indices, blood gases
CO5. Demonstrate the tests to assess the functional integrity of the respiratoryand cardiovascular system
CO6. Correlate the disease condition with physiological aspects of bodily functions

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4. Course Contents

THEORY

Blood

Composition and function of blood, blood bank, blood transfusion, erythrocytesedimentation rate (ESR) and packed cell volume, anemia, body fluids.

Cardiovascular System

Heart and its muscles, cardiac output, heart sounds, blood pressure, hypertension,ECG.

Digestive System

Physiological anatomy of gastro intestinal tract, functions of digestive system,salivary glands structure and functions, deglutition, stomach, gastric secretion, pancreas, functions of liver, gall bladder, intestine and lipids.

Respiratory System

Functions of respiratory system, physiological anatomy of respiratory system. Mechanism of normal and rigorous respiration. Intra pulmonary pleural pressure, surface tension, recoil tendency of the wall. Transportation of respiratory gases lung

volumes and capacities, regulation of respiration.

Endocrine System

Definition classification of endocrine glands & physiological, anatomy, hormone secreted, physiological function, and their hormones functions of endocrine glands regulation of secretion. Disorders - hypo and hyper secretion of hormone.

Nervous system

Functions of nervous system, neuron structure, classification and properties. Neuroglia, nerve fiber, classification, conduction of impulses continuous and saltatory. Velocity of impulse. Synapse - Structure, types, properties. Receptors and synapses - Definition, classification, properties. Reflex action - Unconditioned properties of reflex action. Babinski's sign. Spinal cord nerve tracts. Ascending tracts, descending tracts - pyramidal tracts - extrapyramidal tracts. Functions of brain EEG. Cerebro spinal fluid (CSF): Formation, circulation, properties, composition and functions lumbar puncture. Autonomic nervous system: sympathetic and parasympathetic distribution and functions and comparison of functions.

Excretory System

Functions of kidneys structural and functional unit nephron, vasarecta, cortical and juxtamedullary nephrons: sites of reabsorption, substance reabsorbed, mechanismsof reabsorption glucose, urea.h + Cl amino acids etc. Tmg, tubular lead, renal threshold % of reabsorption of different substances, selective secretion. Properties and composition of normal urine, urine output. Abnormal constituents in urine, mechanism of urine concentration. Counter - current mechanisms: micturition, innervation of bladder, cystometrogram. Diuretics: water, diuretics, osmotic diuretics, artificial kidney renal function tests - plasma clearance actions of Adh, aldosterone and Pth on kidneys. Renal function tests

Reproductive System

Function of reproductive system, puberty, male reproductive system. Functions of testes, spermatogenesis site, stages, factors influencing semen. Endocrine functionsof testes. Androgens - testosterone structure and functions. Female reproductive system. Ovulation, menstrual cycle. Physiological changes during pregnancy, pregnancy test. Lactation: composition of milk factors controlling lactation.

Muscle Nerve Physiology

Classification of muscle, structure of skeletal muscle, sarcomere contractile proteins,neuromuscular junction. Transmission across, neuromuscular junction. Excitation contraction coupling. Mechanism of muscle contraction muscle tone, fatigue rigormortis

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PRACTICALS

1. White Blood Cell Count
2. Red Blood Cell Count
3. Blood Pressure Recording SL
4. Auscultation of Heart Sounds
5. Artificial Respiration SL
6. Pulmonary Function Tests

2. CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3				
CO1	2			1					2						
CO2	2								2						
CO3	2				1				2						
CO4	2		1		1				2						
CO5	2								1						

3. **Course Teaching and Learning Methods**

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		20
Demonstrations		2
1. Demonstration using Videos	02	
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		02
1. Solving Numerical Problems		
Practical Work		30
1. Course Laboratory	25	
2. Computer Laboratory		
3. Engineering Workshop / Course/Workshop / Kitchen		
4. Clinical Laboratory	5	
5. Hospital		
6. Model Studio		
Others		8
1. Case Study Presentation	3	
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions	6	
5. Group Discussions	10	
6. Discussing Possible Innovations		
Term Test and Written Examination		10

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Total Duration in Hours	70

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4. Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

Focus of Course Learning Outcomes in each component assessed					
	CE (60% Weightage)			SEE (40% Weightage)	
	SC1 (Term Tests)	SC2 (Innovative assignment)	SC3 (Written Assignment) 20%	SEE (Theory) 25%	
	(20 Marks)	20 Marks	20 Marks	60 (40 written exam; 20 Viva-voce)	
CO-1	X	X		X	
CO-2	X	X		X	
CO-3	X			X	
CO-4	X		X	X	
CO-5			X	X	
CO-6		X	X		
CO-7			X		

5. Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Personal Management	Class room lectures
15.	Leadership Skills	Group discussions

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6. Course Resources

2. **Essential Reading**

Gerard J. Tortora, Bryan H. Derrickson (2013) Principles of Anatomy and Physiology 14th Edition. Wileypublications

Sujit Kumar Chaudhuri (2011) Concise Medical New Central Book

Chatterjee CC(2005) Human Physiology Volume 1 and 2 11th edition CBS publishers

D. Venkatesh, H.H. Sudhakar(2015)Textbook of Medical Physiology. Lippincott Williams & Wilkins

3. Recommended Reading

Guyton and Hall (2016) Textbook of Medical Physiology, 13edition Elsevier's publications

ParveenKumar and Michel Clark (2016) Kumar and Clark's Clinical Medicine Ninth edition

Ganong's Review of Medical Physiology, 24th Edition (LANGE Basic Science) 24th Edition

4. Magazines and Journals

5. Websites

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Course Specifications: Health Care Delivery Systems of India

Course Title	Health Care Delivery Systems of India
Course Code	19AHG103A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

1. Course Summary

The aim of the course is to introduce students to the Indian system of health care, health status of the population and initiatives taken at the national level towards improving health status of the population.

The students are oriented to importance of demography and vital statistics and concept of health and disease. The students are exposed to health care delivery systems such as- Siddha, Unani, Homeopathy, Ayurveda and Yoga and Naturopathy. Students are also introduced to concept of integrating health care system to achieve health, measures taken at National level for improving health status of population including National Health programmes.

2. Course Size and Credits:

Number of Credits	02
Total Hours of Classroom Interaction	30
Number of Tutorial Hours	0
Number of Semester Weeks	16
Department Responsible	Allied Health Sciences
Course Marks	Total Marks: 50
Pass Requirement	As per academic regulation
Attendance Requirement	As per academic regulation

Teaching, Learning and Assessment

3. Course Outcomes (COs)

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

CO 1. Describe the Health Care delivery system in India at primary, secondary andtertiary level and identify their role in the health care team

CO 2. Explain the AYUSH system of medicine

CO 3. Explain the National Health programmes in terms of operation, achievements and constraints

CO 4. Explain the importance of Demography and Vital statistics in planning healthpolicy

CO 5. Discuss role of epidemiology and epidemiological methods in health

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4. Course Contents

Part A

Introduction to healthcare delivery system

- Healthcare delivery system in India at primary, secondaryand tertiary care Community participation in healthcare delivery system
- Health system in developed countries Private Sector National Health Mission; National Health Policy and issuesin health care delivery system in India

National Health Programme

Background objectives, action plan, targets, operations, achievements andconstraints in various National Heath Programme

Introduction to AYUSH system of medicine

Introduction to Ayurveda Yoga, naturopathy, unani, siddha and homeopathyNeed for integration of various system of medicine

Health scenario of India- past, present and future

Demography & Vital Statistics

Demography – its concept. Vital events of life & its impact on demography

Significance and recording of vital statistics. Census & its impact on healthpolicy

Epidemiology

Principles of Epidemiology. Natural history of disease

Methods of epidemiological studies Epidemiology of communicable & non-communicable diseases, disease transmission, host defense immunizing agents, cold chain, immunization, disease monitoring and surveillance

PART B

5. CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8					PSO1	PSO2	PSO3	PSO4
CO-1		1		2	1		2						2			1
CO-2	1		1										2			
CO-3			1	2	1			1					2			
CO-4		1		1	1		2						2			
CO-5	1			1									2			
3: High Influence, 2: Moderate Influence, 1: Low Influence																

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6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		25
Demonstrations		
1. Demonstration using Videos		
2. Demonstration using Physical Models /		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop / Course/Workshop / Kitchen		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		
Others		
1. Case Study Presentation		
2. Guest Lecture		
3. Industry / Field Visit		05
4. Brain Storming Sessions		
5. Group Discussions	05	
6. Discussing Possible Innovations		
Term Test and Written Examination		05
Total Duration in Hours		35

7. Course Assessment and Reassessment

The components and subcomponents of course assessment are presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

Focus of Course Learning Outcomes in each component assessed				
	CE (60% Weightage)			SEE
	SC1 Term Tests	SC2 Assignments 10%	SC3 Assignments 20%	
	20 Marks	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X		X	X
CO-4	X		X	X
CO-5			X	X
CO-6			X	X

The Course Leader assigned to the course, in consultation with the Head of the Department, shall provide the focus of course outcomes in each component assessed in the above template at the

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beginning of the semester. Course reassessment policies are also presented in the Academic Regulations document.

8. Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Personal Management	Group discussions
15.	Leadership Skills	Class room lectures

9. Course Resources

a. **Essential Reading**

Community Medicine with recent advances - AH Suryakantha - 4th Edition - Jaypee PublishersReview in Community Medicine - VVR SeshuBabu - 2nd Edition - Paras Medical Books Epidemiology for Undergraduates - Marina Rajan Joseph - Jaypee Publishers

b. Recommended Reading

Park's Textbook of Preventive and Social Medicine - K. Park - 22nd Edition - BhanotPublishers

Oxford Textbook of Public Health - Roger Detels - 5th Edition - Oxford University PressNational Health Programs of India - J Kishore - 12th Edition - Century Publications

c. Magazines and Journals

d. Websites

e. Other Electronic Resources

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Course Specifications: General Microbiology

Course Title	General Microbiology
Course Code	19AHG107A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

1. Course Summary

This course introduces the principles of Microbiology with emphasis on applied aspects of Microbiology of infectious diseases particularly in the Principles & practice of sterilization methods, collection and despatch of specimens for routine microbiological investigations, interpretation of commonly done bacteriological and serological investigations, and control of hospital infections. This will help the students to maintain sterile working environment and appropriate sample collection.

2. Course Size and Credits:

Number of Credits	03
Total Hours of Classroom Interaction	30
Number of laboratory Hours	30
Number of Semester Weeks	16
Department Responsible	Allied Health Sciences.
Course Marks	Total Marks: 100
Pass Requirement	As per the academic regulation
Attendance Requirement	As per the academic regulation

Teaching, Learning and Assessment

3. Course Outcomes (COs)

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

CO1. Describe the morphology, physiology and characteristics of microorganisms
CO2. Describe the principles and practice of sterilization and disinfection
CO3. Discuss immunology, and immunity
CO4. Demonstrate sterilization procedures and use of sterilization equipment
CO5. Demonstrate Collection and transport of specimens to the laboratory

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Course Contents

Introduction to Microbiology

History, introduction, scope, aims and objectives. Morphology and physiology of bacteria. Detail account of sterilisation and disinfection. Brief account of culture mediaand culture techniques. Basic knowledge of selection, collection, transport, processing of clinical specimens and identification of bacteria and drug resistance in bacteria

Immunology

Infection - Definition, Classification, Source, Mode of transmission andtypes of Infectious disease.Immunity. Structure and functions of Immune system. The Complement System. Antigen. Immunoglobulins - Antibodies - General structure and the role playedin defence mechanism of the body.Immune response. Antigen -

Antibody reactions - with reference to clinical utility. And hHypersensitivity reactions.

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Systematic bacteriology

Pyogenic cocci - Staphylococcus, Streptococcus, Pneumococcus, Gonococcus, Meningococcus – brief account of each coccus– detailed account of mode of spread, laboratory diagnosis.

Mycobacteria - Tuberculosis and Leprosy.

Clostridium - Gas gangrene, food poisoning and tetanus.

Non-sporing Anaerobes - in brief about classification and morphology,in detail aboutViruses: HIV and Hepatitis- Pathogenesis, Lab Diagnosis and management

Laboratory:

Demonstration of sterilization equipment's: hot air oven, autoclave, bacterial filters. Demonstration of commonly used culture media, nutrient broth, nutrient agar, bloodagar, chocolate agar, MacConkey medium, L J media, Robertson cooked meat media.Anaerobic culture methods.

Antibiotic susceptibility test.

Demonstration of common serological tests: ELISA.Demonstration of Grams staining.

Demonstration of Acid fast staining.

Sample collection methods, storage and transport.

4. CO-PO PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8					PSO1	PSO2	PSO3	PSO4
CO-1	1												2			
CO-2	2		1		1								2			
CO-3	1		1										2			
CO-4	2				1								2			
CO-5	2	1		2									2			
	3: High Influence, 2: Moderate Influence, 1: Low Influence															

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5. Course Teaching and Learning Methods:

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		24
Demonstrations		00
1. Demonstration using Videos		
2. Demonstration using Physical Models / Systems	00	
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		26
1. Course Laboratory	16	
2. Computer Laboratory		
3. Engineering Workshop / Course/Workshop / Kitchen		
4. Clinical Laboratory	05	
5. Hospital	05	
6. Model Studio	00	

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Others		02
1. Case Study Presentation	02	
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations		
Term Tests, Laboratory Examination/Written Examination, Presentations		08
Total Duration in Hours		**60**

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6. Course Assessment and Reassessment

The components and subcomponents of course assessment are presented in the Academic Regulations document pertaining to the program. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

Focus of Course Learning Outcomes in each component assessed				
	CE (60% Weightage)			SEE (40% Weightage)
	SC1 Term Tests	SC2 Assignments	SC3 Assignments	
	20 Marks	20 Marks	20 Marks	60 (40 written exam; 20 Viva-voce)
CO-1	X	X		X
CO-2	X	X		X
CO-3	X	X	X	X
CO-4	X		X	X
CO-5			X	X

The Course Leader assigned to the course, in consultation with the Head of the Department, shall provide the focus of course outcomes in each component assessed in the above template at the beginning of the semester.

Course reassessment policies are also presented in the Academic Regulations document.

7. Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

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S.No	Curriculum and Capabilities Skills	How imparted during the course
1	Knowledge	Lecture
2	Understanding	lecture
3	Critical Skills	Assignments, case study discussion,small group discussion
4	Analytical Skills	Assignments, case study discussion,small group discussion
5	Problem Solving Skills	Assignments
6	Practical Skills	-OSPE
7	Group Work	Assignments
8	Self-Learning	Assignment, OSPE
9	Written Communication Skills	Assignment, Examination

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10	Verbal Communication Skills	Small group discussion
11	Presentation Skills	Small group discussion
12	Behavioral Skills	-
13	Information Management	Assignment
14	Personal Management	-
15	Leadership Skills	-

8. Course Resources

a. Essential Reading

- Class notes
- Ananthnarayan, R. &Panicker, C.K.J., 2009. Textbook of Microbiology. 8th ed. Hyderabad:Universities Press (India) Pvt. Ltd.
- Evan Roitt et al,Immunology. 3rd ed. USA: McGraw Hill Companies Inc.

Recommended Reading

- Apurba S. Sastry&SandhyaBhat K; Essentials of medical Microbiology.Jaypee. The health SciencesPublisher

Magazines and JournalsWebsites

Other Electronic Resources

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Course Specifications: General Biochemistry

Course Title	General Biochemistry
Course Code	AHD107A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

The course aims to impart basic knowledge on biochemistry and its role in health and diseases, emphasizing on the diagnostic aspect of the subject. The course is designed to provide an understanding of the basic process of life in molecular terms. The students are oriented to chemistry of carbohydrates, proteins, lipids, and various metabolic pathways to understand and utilize different biomolecules, nutrition, and nutritional support with special emphasis on parental nutrition. Students learn about specimen collection, and different laboratory apparatus used and reparation of solutions. They are exposed to the concept of quality control. They will perform routine urine and blood investigations and interpret and diagnose abnormalities.

2. Course Size and Credits:

Number of credits	02
Total Hours of Classroom Interaction	30
Number of laboratory Hours	00
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 50
Pass Requirement	As per academic regulations
Attendance Requirement	As per academic regulations

Teaching, Learning and Assessment

3. Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Describe the various laboratory apparatus used, the steps in specimen collection and safety measurements to be taken in biochemistry laboratory

CO2. Explain different models of atomic structure, acids, bases, buffers and disturbances in acid base balance

CO3. Explain quality control, precision, specificity, sensitivity when conducting special investigations

CO4. Demonstrate qualitative and quantitative estimations of various analyses (urine, blood)

CO5. Interpret the various biochemical parameters in health and disease

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4. Course

ContentsTHEORY

Specimen collection

Pre-analytical variables. Collection of blood. Collection of CSF & other fluids. Urine collection. Use of preservatives. Anticoagulants.

Introduction to laboratory apparatus

Pipettes: different types (graduated, volumetric, Pasteur, automatic etc.).Calibration ofglass pipettes. Burettes, beakers, petri dishes, depression plates. Flasks: different types(volumetric, round bottomed, Erlenmeyer conical etc.).Funnels: different types (conical, Buchner etc.).Bottles: reagent bottles – graduated and common, wash bottles different type specimen bottles

Instruments

Use, care and maintenance of: water bath, oven & incubators, water distillation plant,water deionizers, refrigerators, cold box, deep freezers, reflux condenser, centrifuge, balances, colorimeter, spectrophotometer, pH meter and electrodes.

Centrifuges: definition, principles, Svedberg unit, centrifugal force, centrifugal field,RPM, conversion of G to RPM and vice versa, different types of centrifuges.

Manual balances: single pan, double pan, triple balance, direct read out electricalbalances.

Microscopy:- Safety of measurements & Conventional and SI units

Dilutions

Acids & Bases

Acid- base indicator Theory

Quality control

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5. CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		1	1		2								2		
CO2					2								2		
CO3	1				2								2		
CO4	2				2								3		
CO5	2				2								2		
CO6	3				2								2		
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		25
Demonstrations		0 5
1. Demonstration using Videos	05	
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		02
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop / Course/Workshop / Kitchen		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		
Others		
1. Case Study Presentation		
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations		
Term Test and Written Examination		05
Total Duration in Hours		35

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7. Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

	CE (60% Weightage)			
	SC1 (Term Tests)	**SC2 (Innovative + assignment)**	**SC3 (Written assignment)**	**SEE (Theory) 25%**
	(20 Marks)	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X			X
CO-4	X		X	X
CO-5			X	X
CO-6		X	X	
CO-7			X	

8. Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Classroom lectures
2.	Understanding	Classroom lectures
3.	Critical Skills	Class room lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Personal Management	Group discussions
15.	Leadership Skills	Class room lectures

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9. Course Resources

a. **Essential Reading**

1. Vasudevan, D.M., Sreekumari, S., Vaidyanathan, K. Textbook of Biochemistry for Medical Students,Jaypee Brothers Medical Publishers, New Delhi, 8th Ed, 2016
2. Satyanarayana U, Chakrapani U. Biochemistry. Books & Allied (P) Ltd, Kolkata 4th Ed, 2013

b. Recommended Reading

1. Murray Rk, GrannerDk, RochwellVw. Harper's Illustrated Biochemistry, Lange McGraw Hill, NewYork, 30th Ed, 2015
2. Champe Pc, Harvey Ra, Ferrier Dr. Lippincott's Illustrated Reviews Biochemistry, Wolters KluwerHealth, Lippincotts Williams & Wilkins, New Delhi, 6th Ed, 2013
3. DasDebjyoti, Fundamentals of Biochemistry books & allied, Kolkata 14th Ed, 2012
4. Varley , Clinical chemistry 4th edition
5. Teitz , Fundamentals of clinical chemistry 6th edition

c. Magazines and Journals

1. Journal of clinical chemistry and laboratory medicine
2. Indian journal of medical biochemistry

d. Websites

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Course Specifications: General Pharmacology

Course Title	General Pharmacology
Course Code	AHD108A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

1. Course Summary

The aim of the course is to introduce students of allied health sciences to the Pharmacological basis of therapeutics. This should help them to understand therapeutics in management of various diseases.

Pharmacology, the science of drugs, has special reference to the students of allied health sciences. Practice ofvarious technologies involves use of pharmacological agents both for diagnosis and treatment. The students are oriented to importance of pharmacological basis of therapeutic intervention. Broad understanding of pharmacology with emphasis on how human body handles a drug is imperative to these students.

2. Course Size and Credits:

Number of Credits	02
Total Hours of Classroom Interaction	30
Number of Tutorial Hours	00
Number of Semester Weeks	16
Department Responsible	Allied Health Sciences
Course Marks	Total Marks: 50 As per academic regulations
Pass Requirement	As per academic regulations
Attendance Requirement	As per academic regulations

Teaching, Learning and Assessment

3. Course Outcomes (COs)

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

CO 1. Describe pharmacokinetic principles in relation to drug administration

CO 2. Explain the concept of pharmacodynamics in relation to drug utilization in therapeutics

CO 3. Explain the concept of chemotherapy in relation to infectious diseases

CO 4. Explain the importance of adverse effects in therapeutics of various drug usage

CO 5. Identify drugs dosage forms and posology in management of diseases and calculate doses in various age groups

CO 6. Interpret the importance of drug combinations with reference to therapeutic index and drug utilization

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4. Course Contents

General Pharmacology

Introduction to pharmacology-various terminologies-sources & routes of drug administration – Absorption & Factors modifying drug absorption – Distribution of drugs – Metabolism: Phase II, - Excretion: routes, modes & kinetics of elimination –Excretion – Mechanism of drug action in brief, synergism & antagonism and Factorsmodifying drug action – Adverse drug reactions – ADR reporting & monitoring –

Drug interactions

Pharmacokinetics

Pharmacokinetics and dynamics of drugs acting on Central Nervous System &

Respiratory System Introduction to CNS and Neurotransmitters, drugs used ininsomnia, Sedatives and hypnotics

Safety and efficacy of drugs acting on Cardio vascular system & blood. Drugs used in Ischemic Heart Disease-nitrates-Calcium channel, immunomodilators, hormones

Drug use in children and geriatric population with reference to antimicrobials.

5. CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO-1	2			2	2								2		
CO-2	2			1	2								2		
CO-3	2				2								2		
CO-4	3				2			1					3		
CO-5	2				2			1					2		
3: High Influence, 2: Moderate Influence, 1: Low Influence															

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6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		25
Demonstrations		5
1. Demonstration using Videos	5	
2. Demonstration using Physical Models /		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop / Course/Workshop / Kitchen		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		
Others		
1. Case Study Presentation		
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations		
Term Test and Written Examination		5
Total Duration in Hours		35

7. Course Assessment and Reassessment

The components and subcomponents of course assessment are presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

Focus of Course Learning Outcomes in each component assessed				
	CE (60% Weightage)			SEE
	SC1 Term Tests	SC2 Assignments	SC3 Innovative Assignments	
	25 + 25 Marks	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X		X	X
CO-4	X		X	X
CO-5			X	X

The Course Leader assigned to the course, in consultation with the Head of the Department, shall provide the focus of course outcomes in each component assessed in the above template at the

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beginning of the semester. Course reassessment policies are also presented in the Academic Regulations document.

8. Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Classroom lectures
2.	Understanding	Classroom lectures
3.	Critical Skills	Classroom lectures
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	case study and group discussions
8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Personal Management	Group discussions
15.	Leadership Skills	Group discussion

9. Course Resources

a. Essential Reading

- Essentials of Medical Pharmacology: K.D. Tripathi, 6th edition, Jaypee Publishers
- Medical Pharmacology. S K Shrivastava. Avichal publishing NewDelhi
- Manual of Practical Pharmacology. Avichal Publications.

b. Recommended Reading

c. Lippincott's Illustrated Reviews: Pharmacology, 5th edition, by Richard A. Harvey andPamela C. Champe, Lippincott Williams & Wilkins Publisher

d. Katzung's Basic and Clinical Pharmacology 13th edition. Lange Publication.

e. Magazines and Journals

f. Websites

g. Other Electronic Resources

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Course Specifications: Concepts of Hospital Infection Prevention

Course Title	Concepts of Infection Prevention
Course Code	AHD109A
Department	Allied Health Sciences
Faculty	Life and Allied Health Sciences

1. Course Summary:

The aim of the course is to help students understand the basic concepts of quality in healthCare and develop skills to implement prevention of infection spreading in the health system

The students will be introduced to aspects such as Bio medical waste management and environment safety, Infection prevention and control, Antibiotic Resistance and Disaster preparedness and management.

2. Course Size and Credits:

Number of Credits	2
Total Hours of Classroom Interaction	30
Number of Tutorial Hours	-
Number of Semester Weeks	16
Department Responsible	Allied Health Sciences
Course Marks	Total Marks: 50 The distribution of marks for theory and laboratory/clinical component for continuousand Semester end examination is as per the programme specification
Pass Requirement	A minimum of overall 40% in component 1and component 2 are required for a pass. It is mandatory to attend the semester end examination.
Attendance Requirement	A minimum of 80% attendance is mandatory to appear for semester endexamination.

Teaching, Learning and Assessment

3. Course Outcomes (COs)

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

CO-1: Explain the steps involved in infection prevention and control

CO-2: Understand the working and application of CSSD

CO-3: Explain the importance of antibiotic resistance in the patient care and ways to prevent it.

CO-4: Apply the concepts of biomedical waste management to ensure clean and hazard free hospitalenvironment

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4. Course Contents

Bio medical waste management and environment safety

Definition of Biomedical Waste. Waste minimization. BMW – Segregation, collection,transportation, treatment and disposal (including color coding). Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste. BMW Management & methodsof disinfection. Modern technology for handling BMW. Use of personal protective equipment (PPE). Monitoring & controlling of cross infection (Protective devices)

Infection prevention and control

Evidence-based infection control principles and practices [such as sterilization, disinfection, effective hand hygiene and use of Personal protective equipment (PPE)]. Prevention & control of common healthcare associated infections. Components of aneffective infection control program and Guidelines (NABH and JCI) for Hospital Infection Control. Spill management.

Antibiotic Resistance

History of antibiotics. How resistance happens and spreads. Types of resistance- Intrinsic, acquired, passive. Trends in drug resistance. Actions to fight resistance. Bacterial persistence. Antibiotic sensitivity. Consequences of antibiotic resistance. Antimicrobial stewardship- Barriers and opportunities. Tools and models in hospitals.

Working of CSSD:

Understand the concepts of sterilization, disinfection in CSSD, Structure and workingof CSSD

10. **CO-PO Mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO-1				3			3						3		1
CO-2				1	3		1						3		
CO-3				1	3		1						3		
CO-4					3		1						3		
3: High Influence, 2: Moderate Influence, 1: Low Influence															

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11. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		20
Demonstrations		2
1. Demonstration using Videos	2	
2. Demonstration using Physical Models /		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		8
1. Course Laboratory	15	
2. Computer Laboratory		
3. Engineering Workshop / Course/Workshop / Kitchen		
4. Clinical Laboratory	5	
5. Hospital	5	
6. Model Studio		
Others		0
1. Case Study Presentation	2	
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions	3	
5. Group Discussions	10	
6. Discussing Possible Innovations		
Term Test and Written Examination		8
Total Duration in Hours		38

12. Course Assessment and Reassessment

The components and subcomponents of course assessment are presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

Focus of Course Learning Outcomes in each component assessed				
	CE (60% Weightage)			SEE
	SC1 Term Tests	SC2 Assignments	SC3 Innovative Assignments	
	20 Marks	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X		X	X
CO-4	X		X	X

The Course Leader assigned to the course, in consultation with the Head of the Department, shall provide the focus of course outcomes in each component assessed in the above template at the

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beginning of the semester. Course reassessment policies are also presented in the Academic Regulations document.

13. Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Lectures
2.	Understanding	Practical. Tutorials and lectures
3.	Critical Skills	Tutorials SGD
4.	Analytical Skills	Practical
5.	Problem Solving Skills	Case studies SGD
6.	Practical Skills	Practicals, OSPE
7.	Group Work	Seminar SGD
8.	Self-Learning	SDL SGD assignment
9.	Written Communication Skills	Semester exams ,test and assignment
10.	Verbal Communication Skills	Seminar and SGD
11.	Presentation Skills	Seminar
12.	Behavioral Skills	practical
13.	Information Management	assignment
14.	Personal Management	
15.	Leadership Skills	Group discussion

14. Course Resources

h. Essential Reading

i. Class notes

j. Essentials of Hospital Infection Control by Apurba Shastry

k. Recommended Reading

l. Magazines and Journals

m. Websites

n. Other Electronic Resources

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Course Specifications: General Pathology

Course Title	General Pathology
Course Code	AHD110A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

1. Course Summary

The aim of the course is to introduce students of allied health sciences to concepts of general Pathology. This should help them to build a foundation for understanding pathological basis of various diseases with special reference to radiation technology and dialysis technology. The course would help integrate knowledge of basic concepts of pathology and clinical medicine into allied sciences. At the end of the course, the studentwill learn fundamental aspects of cellular injury, inflammation, tissue repair, immunology,neoplasia, histopathology, hematology and blood banking

2. Course Size and Credits:

Number of Credits	03
Total Hours of Classroom Interaction	30
Number of Tutorial Hours	15
Number of Semester Weeks	16
Department Responsible	Allied Health Sciences
Course Marks	Total Marks: 100 The distribution of marks for theory and laboratory/clinical component for continuous and semester end examination is as per the programme specification
Pass Requirement	A minimum of overall 40% in component1 and component 2 are required for a pass. It is mandatory to attend the semester end examination.
Attendance Requirement	A minimum of 80% attendance is mandatory to appear for semester end examination.

Teaching, Learning and Assessment

3. Course Outcomes (COs)

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

CO-1: Describe basic facts and concepts of pathology
CO-2: Explain fundamental aspects of hematology and blood banking
CO-3: Explain the various clinical pathology tests
CO-4: Perform laboratory tests related to hematology and clinical pathology
CO-5: Interpret the results of laboratory tests
CO-6: Apply concepts of general pathology to understand pathological basis of disease

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4. Course Contents

General Pathology

General Pathology Adaptations, Cell Injury and Repair: Hyperplasia, atrophy,metaplasia, necrosis and apoptosis - Differences between apoptosis and necrosis.

Acute and Chronic inflammation: Five cardinal signs of inflammation- Outcomes of acute inflammation- Chronic inflammation-Granulomatous inflammation-Acute phaseproteins.

Tissue repair, regeneration and hemodynamic disorders: Cutaneous wound healing- Pathologic aspects of repair-Hyperaemia and congestion-Thrombosis and Virchow triad-Embolism-Infarction Shock; Bronchial asthma, COPD.

Diseases of immune system: Hypersensitivity reaction-Type I, II, III, and IV hypersensitivity reactions.

Neoplasia: Definition of neoplasia. Differences between benign and malignant tumors ; Metastasis ; Carcinogenesis – Causes ; Carcinoma of oral cavity – Causes;Etiology of Carcinoma cervix – type of virus implicated, high risk sero-types, Screening investigations; Breast carcinoma – Risk factors

Histopathology

Introduction to histopathology. Receiving of specimen in the laboratory. Grossing techniques. Mounting techniques: various mountants. Maintenance of records and filing of the slides. Use& care of microscope. Various fixatives, mode of action, preparation and indication.

Sectioncutting. Tissue processing for routine paraffin sections. Decalcification of tissues.

Staining of tissues: H & E Staining. Bio-medical waste management. Frozen section cutting and staining.

Blood Bank

Introduction. Blood grouping and Rh types. Cross matching

Laboratory

Urine Examination: physical, chemical, microscopic.

Blood grouping Rh typing. Cross matching (Observation), how to send samples for

Understand the concepts of sterilization, disinfection in CSSD, Structure and workingof CSSD

cross matching, PT, APTT and Hb, packed cell volume (PCV), erythrocytesedimentation

rate (ESR), bleeding tome, clotting time

Frozen section cutting and H &E staining.

Collection, transport, and preservation, of various clinical specimens.(Urine, CSF,sputum and other body fluids)

5. **CO-PO Mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO-1	1				1								2		
CO-2	1		1	1									2		
CO-3	2				2								2		
CO-4	2		1		2								2		
CO-5	2			1									2		
CO-6	2		1		2			1					2		1
3: High Influence, 2: Moderate Influence, 1: Low Influence															

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6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		25
Demonstrations		2
1. Demonstration using Videos		
2. Demonstration using Physical Models /	5	
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory	15	
2. Computer Laboratory		
3. Engineering Workshop / Course/Workshop / Kitchen		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		
Others		
1. Case Study Presentation		
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations		
Term Test and Written Examination		10
Total Duration in Hours		55

7. Course Assessment and Reassessment

The components and subcomponents of course assessment are presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

Focus of Course Learning Outcomes in each component assessed				
	CE (60% Weightage)			SEE
	SC1 Term Tests	SC2 Assignments	SC3 innovative Assignments	
	20 Marks	20 Marks	20 Marks	60 Marks(40 written exam) 20 Marks (Viva voce)
CO-1	X	X		X
CO-2	X	X		X
CO-3	X		X	X
CO-4	X		X	X
CO-5				
CO-6				

The Course Leader assigned to the course, in consultation with the Head of the Department, shall provide the focus of course outcomes in each component assessed in the above template at the

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beginning of the semester. Course reassessment policies are also presented in the Academic Regulations document.

8. Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Class room lectures
2.	Understanding	Class room lectures
3.	Critical Skills	Case study and group discussions
4.	Analytical Skills	Group discussion
5.	Problem Solving Skills	Case discussions
6.	Practical Skills	Case discussions
7.	Group Work	Case study and group discussions
8.	Self-Learning	Assignments/Reports
9.	Written Communication Skills	Examination
10.	Verbal Communication Skills	Group discussions
11.	Presentation Skills	Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Personal Management	Group discussions
15.	Leadership Skills	Class room lectures

9. Course Resources

Essential Reading

Sood R, (1996), Laboratory Technology- Methods and interpretation, 4th Ed. J.P. Bros, New Delhi. Nayak R, (2017), Textbook of Pathology for Allied Health sciences, Jaypee brothers Medical Publishers,New Delhi.

MdTahmiunur Rahman Sajal et al, (2013), A Short Textbook of Pathology, 2nd Ed, Jaypee,New Delhi

Class notes

Recommended Reading

Gupta S, (1998) Short text book of Medical Laboratory for technician, J.P. Bros, New Delhi.

Satish M Kawthalkar, (2010), Essentials of Clinical Pathology, Jaypee brothers Medical Publishers, New Delhi.

Harsh Mohan, (2005), Textbook of Pathology, 5th Ed, Jaypee brothers Medical Publishers, New Delhi.

o. Magazines and Journals

p. Websites

q. Other Electronic Resources

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B.Sc. (Hons) in Anaesthesia and Operation Theatre Technology 2022-2026

SEMESTER 3

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Course Specifications: Clinical Pharmacology

Course Title	Clinical Pharmacology
Course Code	AOC201A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

The aim of the course is to introduce students to the role of Pharmacological agents to theoutcome of patients suffering from various diseases and who need surgical and consequentlyanesthetic drug intervention.

Pharmacological agents can interfere in the management of various diseases by producing ofdrug-drug interactions.

The students are oriented to importance of pharmacological principles of drug therapy. The studentsare exposed to drugs acting on various systems in the body.

They will know the importance of care to be taken during drug anesthetic interventions. Drugs usedfor anesthesia, pre-anesthetic preparations and post-operative management will be discussed.

5. Course Size and Credits:

Number of credits	02
Total Hours of Classroom Interaction	30
Number of laboratory Hours	0
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 50
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

6. Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Describe the pharmacological basis of drug usage in therapeutics with special emphasis on pharmacokinetics and pharmacodynamics

CO2. Explain the pharmacological actions and clinical applications of drugs useful in cardiovascular disorders with their adverse effects

CO3. Explain the concept of anesthesia and classify anesthetics with reference to theirusefulness during anesthesia

CO4. Explain pharmacological actions and adverse effects of analgesics. Describe theirrole in therapeutics

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7. Course

ContentsTHEORY

Pharmacology
Definition, Pharmacokinetics and Pharmacodynamics, Routes of drugadministration, Bioavailability.

Emergency Drugs
- Mode or administration, dilution, dosage and effects.
  Adrenaline, Atropine, Ephedrine, Mephentramine, Bicarbonate, calcium, Inotropes: dopamine, dobutamine, amidarone, Aminophylline, hydrocortisone,antihistaminic, Antihypertensive –Beta-blockers, Ca-channel blockers. Antiarrhythmic- xylocard

Vasodilators
Nitroglycerin & sodium nitroprusside
Sedatives
Anxiolytics: Diazepam, Midazolam, Phenergan, Lorazepam, Chlorpromazine,and Triclofos.
Antisialagogues
Atropine, Glycopyrrolate drug abuse, injury prevention and violence

Narcotics
Morphine, Pethidine, Fentanyl, Pentazozine, tramadol.
Narcotics
Morphine, Pethidine, Fentanyl, Pentazozine, tramadol.
Induction Agent
Thiopentone, Diazepam, Midazolam, Ketamine, Propofol, Etomidate
Muscle Relaxants
Depolarizing - Suxamethonium, Non depolarizing - Vecuronium,
Inhalational Gases
Gases-02, N20, Air, Agents-Ether ,Halothane, Isoflurane, Saevoflurane,Desflurane
Local Anesthetics
Xylocaine, Bupivacaine - Topical, Prilocaine-jelly, Emla - Ointment,
Respiratory system
Bronchodilators Renal system- Diuretics, frusemide, mannitol
Reversal Agents
Neostigmine, Glycopyrrolate,Atropine, Naloxone, Flumazenil(Diazepam).
Preparation and prescription of drugs of relevance.
Experimental pharmacology directed to show the effects of commonly useddrugs of relevance and interpretation of few charts.

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8. CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1									2				1	
CO2	1									2				1	
CO3	2			1						2				2	
CO4	2	1	1	1				1		3				2	1
CO5	3	1	1	2	2		2	2		3				3	1
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

9. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		14
Demonstrations		
1. Demonstration using Videos		
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop / Course/Workshop / Kitchen		
4. Clinical Laboratory		
5. Hospital		
6. Model Studio		
Others		12
1. Case Study Presentation	2	
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions	3	
5. Group Discussions	7	
6. Discussing Possible Innovations		
Term Test and Written Examination		04
Total Duration in Hours		30

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10. Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

	CE (60% Weightage)			
	SC1 (Term Tests)	**SC2 (Innovative + assignment)**	**SC3 (Written assignment)**	**SEE (Theory) 25%**
	(20 Marks)	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X			X
CO-4	X		X	X
CO-5			X	X

11. Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Lectures
2.	Understanding	Practical. Tutorials and lectures
3.	Critical Skills	Tutorials SGD
4.	Analytical Skills	Practical
5.	Problem Solving Skills	Case studies SGD
6.	Practical Skills	Practicals, OSPE
7.	Group Work	Seminar SGD
8.	Self-Learning	SDL SGD assignment
9.	Written Communication Skills	Semester exams, test. assignment
10.	Verbal Communication Skills	Seminar and SGD
11.	Presentation Skills	Seminar
12.	Behavioral Skills	Practical,
13.	Information Management	assignment
14.	Personal Management	Group discussion
15.	Leadership Skills	Lectures

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12. Course Resources

13. **Essential Reading**

Class notes

R. S. Satoskar, S.D. Bhandarkar, S. S. Ainapure, Pharmacology and Pharmacotherapeutics, 18thEdition,singleVolume,M/SPopularPrakashan, 350, Madan Mohan Marg, Tardeo, Bombay

K.D.Tripathi,EssentialsofMedicalPharmacology,V.Edition,M/s.JaypeeBrothers, PostBox,7193,G-16, EMCAHouse,23/23,BansariRoad,Daryaganj,NewDelhi.

14. Recommended Reading

Laurence and Bennet, Clinical Pharmacology, ELBS Edition, 9th Edition

15. Magazines and Journals

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Course Specifications: Principles of Anaesthesia

Course Title	Principles of Anaesthesia
Course Code	AOC202A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

The course aims to impart basic knowledge and understanding of various types of gases, anesthetic machines, facial masks laryngoscope and breathing systems used in general anesthesia. With this fundamental information the students will be able to operate and handle the machines.

Students will be introduced to the various parameters essential to check the level of anesthesia and volatile general anesthetics, types of circuits and types of valves required for administration of anesthesia.

Course Size and Credits:

Number of credits	03
Total Hours of Classroom Interaction	30
Number of laboratory Hours	30
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 100
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Describe the medical gas supply systems and anesthesia machine
CO2. Explain the different types of breathing systems and their components
CO3. Differentiate between types of facial masks and airway laryngoscope
CO4. Explain the principle of anesthesia ventilator and monitoring of the Parameters
CO5. Differentiate between various vaporizer
CO6. Explain the procedure of endotracheal intubation

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Course Contents

THEORY

Medical gas supply

- Compressed gas cylinders, Color coding, Cylinder valves, pin index, Gaspiping system
- Alarms and safety devices.

Scavenging of wasteanesthetic gases

Anesthesia machine

Hanger and yoke system, Cylinder pressure gauge, Pressureregulator, Flow meter assembly, Vaporizers

Breathing system

- General considerations: humidity & heat- Methods of humidification, Common components - connectors, adaptors, reservoir bags. Classification of breathing system, Mapleson system-a b c d e f, Jackson Rees system, Bain circuit, Non rebreathing valves

– Ambu valves, the circle system

Airway devices

FaceMask, Laryngoscopes Endotracheal tubes-Types of endotracheal tubes, Oropharyngeal Airway, Nasopharyngeal Airway, Bougie, Catheter Mount,Supraglottic Airway devices, Nasal Prong

Monitoring

Electrocardiography(ECG), Pulseoximetry(Sp02), Temperature- central and peripheral, End tidal carbon dioxide(EtCO2),Anesthesia gas monitoring,Non-invasive blood pressure(NIPB)and Invasive bloodpressure(IBP), Central venous pressure(CVP), PA Pressure, LAPressure& cardiac output, Anesthesia depth monitor,Neuromuscular transmission monitor

Practical

- Anaesthesia Machine
- Volatile Anaesthetic Agents
- Supply of Compressed gasses

Breathing System.

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CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1													1	
CO2	1													1	
CO3	2			1										2	
CO4	2	1	1	1				1						2	1
CO5	3	1	1	2	2		2	2						3	1
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		25
Demonstrations		25
1. Demonstration using Videos		
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		20
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop / Course/Workshop / Kitchen		
4. Clinical Laboratory		
5. Hospital	20	
6. Model Studio		
Others		12
1. Case Study Presentation	5	
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	6	
6. Discussing Possible Innovations		
Term Test and Written Examination		04
Total Duration in Hours		60

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Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

	CE (60% Weightage)			
	SC1 (Term Tests)	**SC2 (Innovative + assignment)**	**SC3 (Written assignment)**	**SEE (Theory) 25%**
	(20 Marks)	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X			X
CO-4	X		X	X
CO-5			X	X

Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Lectures
2.	Understanding	Practical, Tutorials and lectures
3.	Critical Skills	Tutorials, SGD and Assignment
4.	Analytical Skills	Practical , Assignment
5.	Problem Solving Skills	Case studies, SGD
6.	Practical Skills	Practical
7.	Group Work	Seminar, SGD
8.	Self-Learning	SGD and assignment
9.	Written Communication Skills	Semester exams, Test andassignment
10.	Verbal Communication Skills	Seminar and SGD
11.	Presentation Skills	Seminar
12.	Behavioral Skills	SGD ,Practical
13.	Information Management	Assignment
14.	Personal Management	Course work
15.	Leadership Skills	Lectures

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Course Resources

Essential Reading

Class notes

Pillai S Ahanatha Manual of Anesthesia for Operation Theater Technicians-2013) Jaypee Publishers

Short Textbook of Anaesthesia Ajay Yadav- 6th edition

Anaesthetic Equipment made easy SAhanatha Pillai

Essentials of Anaesthetic Equipment -4th edition Baha Al Shaikh

The Anaesthesia Technician and Technologists manual-Glen wood worth

Recommended Reading

Clinical anesthesia by Pramila Bajaj-(2001)5thedition Paras Medical Publisher

Andrew Davey Ali Diba Ward's Anesthetic Equipment 20116th Edition Saunders

Magazines and Journals

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Course Specifications: Direct Clinical Education

Course Title	Direct Clinical Education
Course Code	AOC203A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

The student directed clinical component has been designed to complement the academic program and runs throughout the course. The placement are designed so that the students will be able to observe the practical application of the academic course wherever possible .Students will improve their skillsin clinical procedures. Progressive interaction with patients and professional personnel are monitored as students practice in a supervised setting. Additional areas include problem solving, Identifying machine components and basic side effect management. The course provides students the opportunity to continue to develop confidence and increased skill in simulation and treatment delivery. Studentswill demonstrate competence in beginning, and intermediate procedures in both areas. Students will participate in advanced and specialized treatment procedures.

16. Course Size and Credits:

Number of credits	06
Total Hours of Classroom Interaction	0
Number of laboratory Hours	180
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 100
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

17. Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Perform basic life support and demonstrate use of defibrillator on a mannequin

CO2. Set up operation table, anesthetic equipment, gas cylinders and suction apparatus under supervision

CO3. Assist in preparing instruments and equipment for sterilization

CO4. Assist in disinfecting the operation theatre

CO5. Assist in maintaining the stock and indenting the OT material

CO6. Demonstrate ability to enter appropriate patient data in Hospital Information System under guided supervision

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18. Course

ContentsTHEORY

Resuscitation techniques, anesthesia drugs and techniques, oxygen administrationalong with the apparatus.
Care of patient in the recovery room.
Post-operative pain: evaluation and management.Types of fluid and therapy.
Blood and blood components transfusion.
Preparation of anesthesia machine, intubation kit, suction machine, anesthesiadrugs.
Patient identification, marking, shifting to OT before surgery and out of OT to recovery room after surgery, complete takeover and handover of the patient with vital signs recording before and after surgical procedure to the nursing staff.
Methods of sterilization: Dry Sterilization, wet sterilization, gaseous sterilization, chemical sterilization, sterilization by radiation, techniques of sterilization of rubber articles, technique of sterilization of carbonized articles.
Methods of disinfection, Prevention of hazards of sterilization.Precautions to be taken during sterilization.
Electrical safety precautions in operation theatre.
OT tables, OT lights, suction machines, electrodes, pressure transducers, electricalsafety, application, handling operation.
Care and maintenance and uses of surgical diathermy machine, defibrillator, Boyle'sapparatus, anesthesia machine, monitors, pace-makers and stimulators
Book keeping and Stock maintenance, management of operation theatre in routineand emergency.

CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1		2										2		
CO2	3		2		1								2	2	
CO3	3		2										3		
CO4	3		2										1	2	
CO5	3	2	2	2			1						1		
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		
Demonstrations		
1. Demonstration using Videos		
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		

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1. Solving Numerical Problems		
Practical Work		170
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop / Course/Workshop / Kitchen		
4. Clinical Laboratory		
5. Hospital	170	
6. Model Studio		
Others		10
1. Case Study Presentation	10	
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations		
Term Test and Written Examination		
Total Duration in Hours		180

Course Resources

a. **Essential Reading**

Class notes

Clinical manual

b. Recommended Reading

Pramila Bhalla Textbook For Operation Room Technicians2ed,(2014)Ahuja Book Publishers &Distributor

Pillai S Ahanatha Manual of Anesthesia for Operation Theater Technicians2013) Jaypee Publishers

c. Magazines and Journals

d. Websites

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Course Specifications: Basic of Surgical Procedure

Course Title	Basic of Surgical Procedure
Course Code	AOC204A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

The purpose of this program is to provide students with the general principles of blood transfusion, para-surgical equipment such as operating tables, lamps, and Diathermy machines and to function as a safe, competent surgical technologist in entry level positions. They will be introduced to common surgical procedures including patient positioning, the problems and hazards.

Course Size and Credits:

Number of credits	04
Total Hours of Classroom Interaction	30
Number of laboratory Hours	30/30
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 100
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Describe the basis of blood transfusion, pre transfusion checks and transfusion reactions

CO2. Describe the body fluid compartments and the effect of fluid administration on the fluid volume

CO3. Explain the types of fluids, indications and complications of fluid therapy

CO4. Explain the equipment types their principles and the maintenance in operation theatre

CO5. Describe working principle and hazards caused by electro surgical unit

CO6 Explain working principle of ultrasonic surgical instruments

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Course Contents

THEORY

Blood Transfusion

History of discovery of blood groups and genetics of blood groups.
Types of blood groups and Rh factor.
Coombs test.
Collection of blood, its preservation and standardization.
Various types of blood and blood products (Packed cells, PRP, FFP)
Pre-transfusion checks.
Transfusion reactions.
Fluids and electrolytes
Body fluid compartments and the effect of fluid administration on them.
Types of fluids (crystalloids and colloids) and their chemical composition.
Indications of specific

General surgical procedure and para-surgical equipment

- Operating tables
- Electro Surgical Unit,
- Ligasure
- Harmonic Scalpel
- CUSA
- Operating Light
- Operation Theatre sterilization
- Positioning of patient for different operations: Problems and hazards.
- LAR/APR
- Total thyroidectomy
- Transthoracic esophagectomy—Different approaches.
- Venesection and Tracheostomy.
- Laproscopic Cholecystectomy–Pneumoperitonium-Creation and removing, principles
- Nephrectomy.
- Breast surgery.

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Practical

- Operating table-accessories and organizing
- Setting up of Operating room
- Setting up surgical trolley
- Skin preparation and draping
- Minor surgeries and major surgeries

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CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1												2		
CO2	1												2		
CO3	2												3		
CO4	3		2					2					3	2	
CO5	3		1		1			2					3	2	
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		20
Demonstrations		
1. Demonstration using Videos	10	1
2. Demonstration using Physical Models		0
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		25
2. Computer Laboratory		
3. Engineering Workshop / Course/Workshop / Kitchen		
4. Clinical Laboratory		
5. Hospital	25	
6. Model Studio		
Others		30
1. Case Study Presentation	10	
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	10	
6. Discussing Possible Innovations	10	
Term Test and Written Examination		05
Total Duration in Hours		90

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Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

	CE (60% Weightage)			
	SC1 (Term Tests)	**SC2 (Innovative + assignment)**	**SC3 (Written assignment)**	**SEE (Theory) 25%**
	(20 Marks)	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X			X
CO-4	X		X	X
CO-5			X	X

Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Lectures
2.	Understanding	Practical, Tutorials and lectures
3.	Critical Skills	Tutorials, SGD and Assignment
4.	Analytical Skills	Practical , Assignment
5.	Problem Solving Skills	Case studies, SGD
6.	Practical Skills	Practical
7.	Group Work	Seminar, SGD
8.	Self-Learning	Seminar
9.	Written Communication Skills	SGD ,Practical
10.	Verbal Communication Skills	Assignment
11.	Presentation Skills	Course work
12.	Behavioral Skills	SGD
13.	Information Management	Seminar
14.	Personal Management	SGD ,Practical
15.	Leadership Skills	Lectures

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Course Resources

Essential Reading

Class notes

Pillai S Ahanatha Manual of Anesthesia for Operation Theater Technicians-2013) Jaypee Publishers

Short Textbook of Anaesthesia Ajay Yadav- 6th edition

Anaesthetic Equipment made easy S Ahanatha Pillai

Essentials of Anaesthetic Equipment -4th edition Baha Al Shaikh

The Anaesthesia Technician and Technologists manual-Glen wood worth

Recommended Reading

Brigden Raymond John Operating theatre technique: A textbook for nurses, technicians, operating department assistants, medical students, house surgeons and others associated with the operating theatre.3rd(1974.)Edition Edinburgh: Churchill

Magazines and Journals

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Course Specifications: Basic Techniques of Anaesthesia

Course Title	Basic Techniques of Anaesthesia
Course Code	AOC205A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

The students will be exposed to basic resuscitation techniques, the anesthetic drugs and the techniques of administration of different types of anesthesia, care of patient in the recovery room and post-operative care and management. Student will be honed with skills for patient shifting intoandout of Operation Theatre.

19. Course Size and Credits:

Number of credits	03
Total Hours of Classroom Interaction	30
Number of laboratory Hours	30/30
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 100
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

20. Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Describe the basic life support , drugs and defibrillator used in CPR
CO2. Explain the principles and techniques of general and regional anesthesia including oral endotracheal intubation and LMA insertion
CO3. Explain the management of patient pre, during and post-anesthesia recovery room
CO4. Identify different drugs and its uses
CO5. Explain technique of general and regional anesthesia
CO6 Describe monitoring of vitals and management of complication

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21. Course Contents

THEORY

Resuscitation techniques

Basic life support (Airway, breathing, circulation) and the equipment used for it
Drugs used inCPR, AED

Anesthesia drugs and techniques

- Principles of anesthesia.
- Basics of general anesthesia- depth, mechanism and intubation.
- Techniques of general anesthesia.
- Various intravenous and inhalational agents.
- Regional anesthesia, spinal and epidural, posture and drugs.
- Local Anesthetic agents. Neuromuscular blocking agents.
- Principles of oxygen administration along with the apparatus
- Care of patient in the recovery room. Post-operative pain: evaluation andmanagement.

Preparation of anesthesia machine, intubation kit, suction machine,anesthesia drugs.

Patient identification, marking, shifting to OT be for surgery and out of OT to recovery room after surgery, complete takeover and handover of the patient with Vital signs recording before and after surgical procedure to the nursing staff.

CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2												1		
CO2	2												2		
CO3	3												2		
CO4	3		1										3		
CO5	3	2	2		1			2					3		
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

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Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		20
Demonstrations		
1. Demonstration using Videos	10	1
2. Demonstration using Physical Models		0
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		
1. Course Laboratory		25
2. Computer Laboratory		
3. Engineering Workshop / Course/Workshop / Kitchen		
4. Clinical Laboratory		
5. Hospital	25	
6. Model Studio		
Others		30
1. Case Study Presentation	10	
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	10	
6. Discussing Possible Innovations	10	
Term Test and Written Examination		05
Total Duration in Hours		90

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Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

	CE (60% Weightage)			
	SC1 (Term Tests)	**SC2 (Innovative + assignment)**	**SC3 (Written assignment)**	**SEE (Theory) 25%**
	(20 Marks)	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X			X
CO-4	X		X	X
CO-5			X	X

Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Lectures
2.	Understanding	Practical, Tutorials and lectures
3.	Critical Skills	Tutorials, SGD and Assignment
4.	Analytical Skills	Practical , Assignment
5.	Problem Solving Skills	Case studies, SGD
6.	Practical Skills	Practical
7.	Group Work	Seminar, SGD
8.	Self-Learning	Seminar
9.	Written Communication Skills	SGD ,Practical
10.	Verbal Communication Skills	Assignment
11.	Presentation Skills	Course work
12.	Behavioral Skills	SGD
13.	Information Management	Seminar
14.	Personal Management	SGD ,Practical
15.	Leadership Skills	Lectures

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Course Resources

Essential Reading

Class notes

Pillai S Ahanatha Manual of Anesthesia for Operation Theater Technicians-2013) Jaypee Publishers

Short Textbook of Anaesthesia Ajay Yadav- 6th edition

Anaesthetic Equipment made easy SAhanatha Pillai

Essentials of Anaesthetic Equipment -4th edition Baha Al Shaikh

The Anaesthesia Technician and Technologists manual-Glen wood worth

Recommended Reading

ArunBKilpadiHandbookofOperationTheatreTechniques (2004)JaypeeBrothersMedical Publishers (P) Ltd.,

Brigden Raymond John Operating theatre technique : A textbook for nurses, technicians,operatingdepartmentassistants,medicalstudents,housesurgeonsand others associatedwith the operating theatre.3rd (1974.)Edition Edinburgh :Churchill Livingstone ; New York : distributed by Longman

EileenDixonTheatreTechnique5thEdition)WBSaundersCo;5edition(June1,1983

PramilaBhallaTextbook For Operation Room Technicians2ed,(2014)Ahuja Book Publishers & Distributor

Magazines and Journals

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Course Specifications: Direct Clinical Education

Course Title	Direct Clinical Education
Course Code	AOC206A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

This course is the final in a series of three directed clinical courses. The student will complete theclinicaltrainingbypracticingalltheskillslearnedinclassroomandclinical instruction and the achieve Clinical Competencies.

22. Course Size and Credits:

Number of credits	03
Total Hours of Classroom Interaction	0
Number of laboratory Hours	90
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 100
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

23. Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Assist in, performing quality checks and maintaining OT equipment, including monitors and ancillary equipment

CO2. Assist in preparing the patient and the OT for advanced surgical procedures.

CO3. Provide intraoperative technical support to seniors

CO4. Assist in preparation of difficult Intubation cart

CO5. Assist in ventilator management

CO6 Assist in care of endotracheal tubes/tracheostomy tubes in ventilated patients

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24. Course

ContentsTHEORY

The purpose of this phase is for the students to achieve clinical competence prepare and maintain Operation Theater in readiness for routine and advancedsurgical procedures maintain equipment support in an acute care environment

Identify and move to maintain a sterile field

Follow infection control policies and procedures

Manage and maintain theater equipment

prepare the patient for operative procedures

Provide intra-operative equipment and technical support

skills and knowledge to assist anesthetist in handling emergencies outside ofOT Room

Manage hazardous waste and follow biomedical waste disposal protocols

Ensure availability of medical and diagnostic supplies

Monitor and assure quality

Act within the limits of one's competence and authority

Work effectively with others

Manage work to meet requirements

Maintain a safe, healthy, and secure working

Demonstrate competence in the manipulation of equipment.

Anticipate the physical and psychological needs of the patient and respond tothem.

Communicate with ease with other staff involved in the multidisciplinarytreatment of the patient.

Increasingly participate as a team member in all aspects of the patient'smanagement.

Competence in simulator procedures.

Participate in the development / revision of formal written quality assuranceprocedures / programme.

Set up a patient on their first visit.

To achieve final competency substantial time will be spent :

Setting up multi field techniques under supervision.

Participating in the quality control procedures in the department in accordancewith the protocols

Preparation of Difficult Intubation cart

Different equipment's required-Supraglottic airway devices, CMAC and otherVideo laryngoscopes

Fibrotic bronchoscopes and their usage

Preparation of the patient in various airway blocks

Different modes of ventilation-SIMV, AC, PS-PEEP

Troubleshooting alarms in ventilated patients

Care of endotracheal tubes/tracheostomy tubes in ventilated patients

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CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2					1					3	2	
CO2	3	2	2					1					3		
CO3	3	3	2			1		1					3		
CO4	3	3	2	1				1					3	2	
CO5	3	2	2	1	1		1	1					3	2	
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		
Demonstrations		
1. Demonstration using Videos		
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		85
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop / Course/Workshop / Kitchen		
4. Clinical Laboratory		
5. Hospital	85	
6. Model Studio		
Others		5
1. Case Study Presentation		
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	5	
6. Discussing Possible Innovations		
Term Test and Written Examination		
Total Duration in Hours		90

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Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

	CE (60% Weightage)			
	SC1 (Term Tests)	SC2 (Innovative + assignment)	SC3 (Written assignment)	SEE (Theory) 25%
	(20 Marks)	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X			X
CO-4	X		X	X
CO-5			X	X

Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	
2.	Understanding	
3.	Critical Skills	
4.	Analytical Skills	
5.	Problem Solving Skills	
6.	Practical Skills	Observation and Assistance
7.	Group Work	
8.	Self-Learning	
9.	Written Communication Skills	Log book/ Portfolio
10.	Verbal Communication Skills	Discussion
11.	Presentation Skills	
12.	Behavioral Skills	Practical
13.	Information Management	Log book/ Portfolio
14.	Personal Management	Course work
15.	Leadership Skills	

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Course Resources

25. Essential Reading

26. Class notes

Recommended Reading

27. Class notes

28. Pillai S Ahanatha manual of anesthesia for operation theater technology

29. Pramila Bhalla Textbook For Operation Room Technicians2ed,(2014)Ahuja Book Publishers &Distributor

Magazines and Journals

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Course Specifications: Advanced Anaesthetic Techniques

Course Title	Advanced Anaesthetic Techniques
Course Code	AOC301A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

- This course aims at imparting advance anesthetic techniques as related to specialized surgical procedures.
- Students will undergo training in preoperative, intraoperative and postoperative requirements of advance anesthetic techniques in various types of surgical procedures. At the end of this coursethey should be able to handle anesthetic equipment outside Operation theatre and manage post-operative complication.

30. Course Size and Credits:

Number of credits	04
Total Hours of Classroom Interaction	30
Number of laboratory Hours	30/30
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 100
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

31. Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Describe the advance anesthetic techniques for special surgical procedures

CO2. Explain the postoperative complications and management associated with the advance anesthetic techniques

CO3. Discuss the anesthetic procedures outside operation theatre

CO4. Describe procedure of intubation and extubation technique

CO5. Describe various positioning for cardiothoracic and neuro procedures

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32. Course

ContentsTHEORY

Cardiovascular and Respiratory System- Techniques, equipment, procedures andinstruments

a. Diseases of cardiovascular andrespiratory systems.
b. Types of perfusion machines.
c. Techniques of Perfusion and operational capabilities.
d. Intra-aortic Balloon pump.
e. Cell saver techniques.
f. Care, maintenance and working of Heart lung Machine.
g. Patient's record keeping preoperatively, during anesthesia and post-operatively.
h. Principles and techniques of temperature monitoring.
i. Positioning during cardiothoracic surgical procedures.
j. Positioning and techniques for:
   - Radial artery cannulation.
   - Central venous cannulation/pulmonary artery catheter.

     Femoral

     artery/venous

     cannulation.

Monitoring Techniques and Equipment:

a. Cardiac monitors, blood pressure and ECG monitoring.
b. Respiratory monitors, respiratory rate, Spirometers, SpO2, and EtCO2.
c. Temperature monitors.
d. TEE and echocardiography machine

     Non- invasive

     cardiac output

     machine

Positioning

- During various neurosurgical procedures including sitting, prone, lateral andposition for trans-sphenoidal hypo-physectomy.
- Fixation of head during various neurosurgical procedures.

  Prone and Knee

  chest position for

  spine surgery.

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- Requirements during intubation in a case of cervical spine fracture includingfiber- optic laryngoscopy, awake intubation, LMA family especially ILMA. Anesthetic and surgical requirements during aneurysm surgery.
- Surgical and Anesthetic requirements during micro neurosurgery including types of microscopes, principle, structural features, microscopic photographyand cameras used.
- Anesthetic and surgical requirements during thyroid surgery, adrenal surgery.
- Anesthetic and surgical requirements during abdominal surgery including Laparoscopic surgery, genitourinary surgery including percutaneous nephron-lithotomy, Endoscopic surgery, TURP, TURBT, Lithotripsy, ESWL (Extracorporeal shock wave therapy)
- Anesthetic and surgical requirement during renal transplant donor and recipient surgery including care and precautions during operative proceduresof hepatitis B & hepatitis C positive patients.
- Anesthetic and surgical requirement during pediatric and Neonatal surgical procedures including emergency procedures like tracheo-esophageal fistula. Sub diaphragmatic hernia, major abdominal and thoracic procedures. Foreignbody bronchus and esophagus.
- Apparatus and techniques for measuring blood pressure and temperature.
- Principle and working of direct/Indirect blood pressure monitoring apparatus.
- Intraoperative and postoperative problems and complications of generalsurgery.
- Surgical management of joint replacement and arthroscopy.
- Surgical management of endoscopies, laryngectomy with RND and cochlearimplant.
- Management and perforating eye injury.

Care and maintenance of Para-surgical equipment (Cautery, OT Lights, OTTable etc.)

CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1												2		
CO2	3												2		
CO3	1												2	1	1
CO4	3	1	1										3	1	1
CO5	3	1	1		1	1		1					3		
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		20
Demonstrations		10
1. Demonstration using Videos	10	
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		

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Practical Work		25
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop / Course/Workshop / Kitchen		
4. Clinical Laboratory		
5. Hospital	25	
6. Model Studio		
Others		30
1. Case Study Presentation	10	
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	10	
6. Discussing Possible Innovations	10	
Term Test and Written Examination		05
Total Duration in Hours		90

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Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

	CE (60% Weightage)			
	SC1 (Term Tests)	**SC2 (Innovative + assignment)**	**SC3 (Written assignment)**	**SEE (Theory) 25%**
	(20 Marks)	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X			X
CO-4	X		X	X
CO-5			X	X

Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Lectures
2.	Understanding	Practical, Tutorials and lectures
3.	Critical Skills	Tutorials, SGD and Assignment
4.	Analytical Skills	Practical , Assignment
5.	Problem Solving Skills	Case studies, SGD
6.	Practical Skills	Practical, OSCE
7.	Group Work	Seminar, SGD
8.	Self-Learning	SGD and assignment
9.	Written Communication Skills	Semester exams, Test and assignment
10.	Verbal Communication Skills	Seminar and SGD
11.	Presentation Skills	Seminar
12.	Behavioral Skills	SGD ,Practical
13.	Information Management	Assignment
14.	Personal Management	Course work
15.	Leadership Skills	Practical , Assignment

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Course Resources

Essential Reading

Class notes

Pillai S Ahanatha Manual of Anesthesia for Operation Theater Technicians-2013) Jaypee Publishers

Short Textbook of Anaesthesia Ajay Yadav- 6th edition

Anaesthetic Equipment made easy SAhanatha Pillai

Essentials of Anaesthetic Equipment -4th edition Baha Al Shaikh

The Anaesthesia Technician and Technologists manual-Glen wood worth

Recommended Reading

- EileenDixonTheatre Technique. 5 edition(1983)W B Saunders Co
- Brigden Raymond John Operating theatre technique: A textbook for nurses, technicians,operating department assistants, medical students, house surgeons and others associated with the operating theatre.3rd (1974.)Edition Edinburgh : Churchill Livingstone ; New York : distributed by Longman,
- Arun B Kilpadi Handbook of Operation Theatre Techniques (2004)Jaypee Brothers Medical Publishers (P)Ltd.,
- Pramila Bhalla Textbook For Operation Room Technicians2ed,(2014)Ahuja Book Publishers& Distributor

Magazines and Journals

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Course Specifications: Basic Intensive Care

Course Title	Basic Intensive Care
Course Code	AOC302A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

- The student acquires the basic knowledge and understanding of the working principles of variousanesthetic equipment required for intensive care of the patient in the theatre and ICU.
- The course also focuses on the development of skills required in handling different types of ventilators, monitoring devices, including their care and maintenance. Students are familiarized withthe care of unconscious adult and pediatric patients, as well as psychological aspects of care givers.

Course Size and Credits:

Number of credits	04
Total Hours of Classroom Interaction	30
Number of laboratory Hours	30/30
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 100
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Describe the basic principles, care and maintenance of various life supporting devices

CO2. Describe maintenance of asepsis of ICU including air conditioning

CO3. Explain types of airways and their usage

CO4 Explain care of semiconscious and unconscious patients in ICU

CO5. Discuss hemofiltration and hemodialysis and its management

CO6: Explain technique of monitoring vitals and management of complication

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Course ContentsTHEORY

Care and maintenance of ventilators, suction machine, monitoring devices.
Sterilization and disinfection of ventilators.
Care, maintenance and operation capabilities of beds, lights and otherapparatus.
Air conditioning and control of pollution in ICU.
Attachment and intraoperative utility of ventilators and monitoring devices.
Care of unconscious adult and pediatric patients.
Physiotherapy techniques, feeding, Ryle's tube insertion and hyper alimentation.
Suctioning and posturing of semiconscious and unconscious patients.
Oxygen therapy, maintenance of clear Airway.
Ventilation of patient in crisis:
Mouth to mouth.
Mouth to ET Tube.
Resuscitator/ bag valve mask assembly
Different types of Airways.
Short term ventilation/ Transport ventilators.
ICU Laboratory; Detection of blood gases of the patient, Principles of ABGmachines.
Management of asepsis.
Management of tetanus patient.
Psychological aspects of the patient, relative and staff.
Hemofiltration and hemodialysis.
Ventilators

Practical

1. Operations of different type of ventilators
2. Sterilization and disinfection of ventilators and life supporting devices
3. Use and care of life supporting devices
4. Collection of blood for ABG
5. Hemodialysis
6. Methods of measuring expired gases from patients
7. Measurement of BP and temperature
8. Use of the suction apparatus and positioning of patients

Monitoring equipment : cardiac and respiratory monitors

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CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1												2		
CO2	3												3		
CO3	3												2		
CO4	3	1											3		
CO5	3				1			1					1		

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	3: High Influence, 2: Moderate Influence, 1: Low Influence

15. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		20
Demonstrations		10
1. Demonstration using Videos	10	
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		25
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital	25	
Demonstrating analysis using a case study		
Others		30
1. Case Study Presentation	10	
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	10	
6. Discussing Possible Innovations	10	
Term Test and Written Examination		05
Total Duration in Hours		90

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Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

	CE (60% Weightage)			
	SC1 (Term Tests)	**SC2 (Innovative + assignment)**	**SC3 (Written assignment)**	**SEE (Theory) 25%**
	(20 Marks)	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X			X
CO-4	X		X	X
CO-5			X	X

16. Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Lectures
2.	Understanding	Practical, Tutorials and lectures
3.	Critical Skills	Tutorials, SGD and Assignment
4.	Analytical Skills	Practical , Assignment
5.	Problem Solving Skills	Case studies, SGD
6.	Practical Skills	Practical, OSCE
7.	Group Work	Seminar, SGD
8.	Self-Learning	SGD and assignment
9.	Written Communication Skills	Semester exams, Test and assignment
10.	Verbal Communication Skills	Seminar and SGD
11.	Presentation Skills	Seminar
12.	Behavioral Skills	SGD ,Practical
13.	Information Management	Assignment
14.	Personal Management	Course work
15.	Leadership Skills	Practical , Assignment

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Course Specifications: Basic Medical Procedure Techniques

Course Title	Basic Medical Procedure Techniques
Course Code	AOC304A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

- This course aims at imparting advance anesthetic techniques as related to specialized surgical procedures.
- Students will undergo training in preoperative, intraoperative and postoperative requirements of advance anesthetic techniques in various types of surgical procedures. At the end of this coursethey should be able to handle anesthetic equipment outside Operation theatre and manage post-operative complication.

1. Course Size and Credits:

Number of credits	04
Total Hours of Classroom Interaction	30
Number of laboratory Hours	30/30
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 100
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

2. Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Describe the basic medical procedure performed in hospital/health care
CO2. Describe the equipments used for various medical procedure
CO3. Explain the techniques of various medical procedure
CO4 Setup trolley for various medical procedure
CO5. Assist anaesthetist or surgeon to perform various medical procedures

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3. Course ContentsTHEORY

IV Cannulation
Bandaging & Splinting
Drainage of Abscess
Foleys Catheter
Nasogastric Tube
Face mask & Airways, CPR- BLS
Making of Vision Dilution of Drugs
Baby resuscitation Trolley
Crash Cart
Defibrillator/AED

ractical

1. Procedure for IV cannulation, CV cannulation, arterial cannulation
2. Technique of endotracheal intubation, insertion of Foley's catheter, NG tube
3. Calculation of ml of drug required from a given % of drug
4. Method of holding resuscitation mask, triple airway maneuver
   CPR protocol

CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1												2		
CO2	3												3		
CO3	3												2		
CO4	3	1											3		
CO5	3			1				1					1		
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

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Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		20
Demonstrations		10
1. Demonstration using Videos	10	
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		

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Practical Work		**25**
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital	25	
Demonstrating analysis using a case study		
Others		30
1. Case Study Presentation	10	
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	10	
6. Discussing Possible Innovations	10	
Term Test and Written Examination		05
Total Duration in Hours		90

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Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

	CE (60% Weightage)			
	SC1 (Term Tests)	**SC2 (Innovative + assignment)**	**SC3 (Written assignment)**	**SEE (Theory) 25%**
	(20 Marks)	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X			X
CO-4	X		X	X
CO-5			X	X

Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Lectures
2.	Understanding	Practical, Tutorials and lectures
3.	Critical Skills	Tutorials, SGD and Assignment
4.	Analytical Skills	Practical , Assignment
5.	Problem Solving Skills	Case studies, SGD
6.	Practical Skills	Practical, OSCE
7.	Group Work	Seminar, SGD
8.	Self-Learning	SGD and assignment
9.	Written Communication Skills	Semester exams, Test and assignment
10.	Verbal Communication Skills	Seminar and SGD
11.	Presentation Skills	Seminar
12.	Behavioral Skills	SGD ,Practical
13.	Information Management	Assignment
14.	Personal Management	Course work
15.	Leadership Skills	Practical , Assignment

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Course Resources

Class notes
Pillai S Ahanatha Manual of Anesthesia for Operation Theater Technicians-2013) Jaypee Publishers
Short Textbook of Anaesthesia Ajay Yadav- 6th edition
Anaesthetic Equipment made easy SAhanatha Pillai
Essentials of Anaesthetic Equipment -4th edition Baha Al Shaikh
The Anaesthesia Technician and Technologists manual-Glen wood worth
Practical Procedure in Anaesthesia & critical Care Guy Jackson

Recommended Reading

Magazines and Journals

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Course Specifications: CSSD

Course Title	CSSD
Course Code	AOC303A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

This course focuses on the one of the most critical aspect of operation theatre technology thatis maintaining an aseptic environment. The student is exposed to principles and different methods of sterilization and techniques of sterilization for different materials. They acquire knowledge on methods of disinfection, hazards of sterilization and precautions taken during sterilization.

4. Course Size and Credits:

Number of credits	02
Total Hours of Classroom Interaction	15
Number of laboratory Hours	30
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 50
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

5. Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Describe the basic principles of sterilization and disinfection
CO2. Compare and contrast different methods of sterilization
CO3. Explain the techniques of sterilization of special materials
CO4. Discuss the ways to prevent hazards of sterilization
CO5. Assist in performing disinfection of the theatre and instruments
CO6: Assist in operating various types of sterilizer

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6. Course ContentsTHEORY

Principles of sterilization & disinfection
Methods of sterilization
Methods of disinfection
Physical layout of CSSD
Work flow of CSSD
Hazards in CSSD
Recent advances in the method of sterilization
Ventilation in OT
Fumigation
Biomedical waste management

Practical

- Methods of cleaning& dusting
- Packing of instrument trays for sterilization
- General care and testing of instruments
- Care of micro surgical & titanium instruments
- PPE
- Surgical scrubbing , gowning & gloving
- Waste disposal

CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		2					3						2	2	
CO2		2					3						2	2	
CO3		2					3						2	2	
CO4		2					3						2	2	
CO5		2	3				3						2	2	
CO6		2					3						2	2	
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

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Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		15
Demonstrations		10
1. Demonstration using Videos		
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		

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1. Solving Numerical Problems		
Practical Work		**20**
Conducting demo interviews and focus		
CSSD DEPT	20	
Demonstrating analysis using a case study		
Others		5
1. Case Study Presentation	5	
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	10	
6. Discussing Possible Innovations	10	
Term Test and Written Examination		05
Total Duration in Hours		45

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	CE (60% Weightage)			
	SC1 (Term Tests)	**SC2 (Innovative + assignment)**	**SC3 (Written assignment)**	**SEE (Theory) 25%**
	(20 Marks)	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X			X
CO-4	X		X	X
CO-5			X	X

Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Lectures
2.	Understanding	Practical, Tutorials and lectures
3.	Critical Skills	Tutorials, SGD and Assignment
4.	Analytical Skills	Practical , Assignment
5.	Problem Solving Skills	Case studies, SGD
6.	Practical Skills	Practical, OSCE
7.	Group Work	Seminar, SGD
8.	Self-Learning	SGD and assignment
9.	Written Communication Skills	Semester exams, Test and assignment
10.	Verbal Communication Skills	Seminar and SGD
11.	Presentation Skills	Seminar
12.	Behavioral Skills	SGD ,Practical
13.	Information Management	Assignment
14.	Personal Management	Course work
15.	Leadership Skills	Practical , Assignment

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Course Specifications: Direct Clinical Education

Course Title	Direct Clinical Education
Course Code	AOC305A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

- The student directed clinical component has been designed to complement the academic program and runsthroughout the course. The placement are designed so that the students will be able to observe the practicalapplication of the academic course wherever possible.
- Students will improve their skills in clinical procedures. Progressive interaction with patients and professional personnel are monitored as students practice in a supervised setting. Additional areas includeproblem solving, identifying machine components and basic side effect management.

Course Size and Credits:

Number of credits	06
Total Hours of Classroom Interaction	
Number of laboratory Hours	180
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 100
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Prepare OT daily for case
CO2. Set up operation table, anesthetic equipment, gas cylinders and suction apparatus under supervision
CO3. Perform drug loading and set anesthesia trolley
CO4 Operate various sterilizers
CO5. Document various recordings in OT
CO6: Provide technical support

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Course ContentsTHEORY

Daily case check.
Daily checklist of OT
Connecting monitoring devices
Drug loading preferred by anaesthetist
Assist senior technologist to get OT ready for the case
Assist senior technologist in loading preferred drugs
Assist senior technologist in connecting diathermy, section apparatus,torniquet, power drill
Assist senior technologist providing technical support during procedure
Instrument washing and packing for sterilization
Operate autoclave
Operate flash sterilize
Operate ETO sterilize
Sterilization of endoscopic instrument
Document biopsy form

Packing biopsy specimen for histo-pathological Discard wastes according to Biomedical Waste management

CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2					1					3	2	
CO2	3	2	2					1					3		
CO3	3	3	2			1		1					3		
CO4	3	3	2	1				1					3	2	
CO5	3	2	2	1	1		1	1					3	2	
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		
Demonstrations		
1. Demonstration using Videos		
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		160
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course		

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Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital	160	
Demonstrating analysis using a case study		
Others		20
1. Case Study Presentation	10	
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions		
6. Discussing Possible Innovations	10	
Term Test and Written Examination		
Total Duration in Hours		180

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Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

	CE (60% Weightage)			
	SC1 (Term Tests)	**SC2 (Innovative + assignment)**	**SC3 (Written assignment)**	**SEE (Theory) 25%**
	(20 Marks)	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X			X
CO-4	X		X	X
CO-5			X	X

Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Lectures
2.	Understanding	Practical, Tutorials and lectures
3.	Critical Skills	Tutorials, SGD and Assignment
4.	Analytical Skills	Practical , Assignment
5.	Problem Solving Skills	Case studies, SGD
6.	Practical Skills	Practical, OSCE
7.	Group Work	Seminar, SGD
8.	Self-Learning	SGD and assignment
9.	Written Communication Skills	Semester exams, Test and assignment
10.	Verbal Communication Skills	Seminar and SGD
11.	Presentation Skills	Seminar
12.	Behavioral Skills	SGD ,Practical
13.	Information Management	Assignment
14.	Personal Management	Course work
15.	Leadership Skills	Practical , Assignment

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Course Resources

Class notes

Pillai S Ahanatha Manual of Anesthesia for Operation Theater Technicians-2013) Jaypee Publishers

Short Textbook of Anaesthesia Ajay Yadav- 6th edition

Anaesthetic Equipment made easy SAhanatha Pillai

Essentials of Anaesthetic Equipment -4th edition Baha Al Shaikh

The Anaesthesia Technician and Technologists manual-Glen wood worth

Practical Procedure in Anaesthesia & critical Care Guy Jackson

Recommended Reading

Magazines and Journals

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Course Specifications: Anaesthesia for Specialised surgery

Course Title	Anaesthesia for Specialised Surgery
Course Code	AOC307A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

- The course aims to provide the knowledge and understanding of anesthetic and surgical equipment used in the operation theatre, achieve competence in the manipulation of equipment to patient immobilization. Course focuses on the anesthetic techniques, procedures and intensive care in special surgeries.

- It aims to provide the student the intraoperative and postoperative complications and management.

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Course Size and Credits:

Number of credits	06
Total Hours of Classroom Interaction	60
Number of laboratory Hours	30/30
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 150
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Describe the basic techniques for specialty surgical procedures including , monitoring techniques and equipment
CO2. Explain the positioning of the patient for specialty surgical procedures
CO3. Explain the anesthetic and surgical management of special surgical Procedures
CO4 Explain the intraoperative and postoperative complications of general surgery

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7. Course ContentsTHEORY

NEURO ANAESTHESIA

Glasgow coma scale , Premedication, Special investigation - CT, Angiography and MRI, Checklist, Induction of a patient, Reinforced Endotracheal tubes, Positioningin neuro surgery, I.C.P., Air embolism, Reversal of the patient, Transferring to I.C.U./ Ward

OBSTETRIC ANAESTHESIA

Differences between a pregnant and a normal lady ,Risks for anesthesia. Precautions to be taken Check list, Regional vs general anesthesia Induction / maintenance and recovery. Resuscitation of the new born, APGAR score , Reversal and extubation, Emergencies - manual removal of placenta, A.P .H., P.P.H. Ruptures uterus, Ectopic Pregnancy

PAEDIATRIC ANAESTHESIA

Theatre setting, Check list, Premedication - modes Induction, Intubation - Securingthe EIT, Reversal & extubation – Problems, Transferring / ICU management

Pain management

ENT Anesthesia

Anesthesia for adenotonsillectomy, Anaesthesia for mastoidectomy, Bronchoscopy and

oesophagoscopy

CARDIAC ANAESTHESIA :

NYHA classification, Arrhythmias, Angina, Dyspnoea, Special investigations, echocardiography, angiography, Premedication, Setting up of monitoring system Monitoring - invasive and non – invasive, Getting ready for the case, Induction ofcardiac patient, precautions to be taken Cardiopulmonary bypass Weaning of CPBTransferring the patient to ICU. Care to be taken I.C.U management. Chest tubemanagement

ANAESTHESIA OUTSIDE THE O.R.

Situations, Cath Lab, Radiology, E.C.T., Short comings.

DAY CARE ANAESTHESIA

Special features Set up, Advantages, Disadvantages, Complications, Future

GERIATRIC ANAESTHESIA

Physiological changes, Diseases of aging, Nervous system, Geriatric pharmacodynamics / pharmacokinetics, Postoperative nervous system dysfunction

ANAESTHESIA FOR TRAUMA & SHOCK

Resuscitation, Preoop investigation I assessment, Criculatory managementManagement of anaesthesia, Rapid sequence induction, Other problems

THORACIC ANAESTHESIA

Pulmonary function tests bed side, Vitallograph, Preoperative preparation,Premedication, Check list, Induction. Intubation, Double lumen tubes monitoring Pain management, Extubation, ICU management

Postoperative problems

Nausea & Vomiting, Sore throat, Laryngeal granuloma, Neurological complications.Awareness

Vascular complications.

Trauma to teeth, Headache, Backache, Ocular complications, Auditory complications, MAJOR CATASTROPHES, Mortality, Causes of death, Cerebral damagePrevention.

Checking blood pressure, checking CBG, process of nebulization, Difficult intubation cart, difficult airway management, setting up ofIBP/CVP

Practicals

1. Special Endotracheal Tubes
2. Positioning in anaesthesia
3. Neonatal resuscitation
4. Theatre setting for paediatric anaesthesia

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5. Theatre setting for bronchoscopy & Esophagoscopy
6. Theater setting for invasive monitoring
7. Theatre setting for obstetric anaesthesia
8. Cardiopulmonary bypass
9. Anaesthesia in remote location Anaesthesia for trauma

CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1												2		
CO2	1												2		
CO3	2												3		
CO4	3		2					2					3	2	
CO5	3		1		1			2					3	2	
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		50
Demonstrations		10
1. Demonstration using Videos	10	
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		30
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital	30	
Demonstrating analysis using a case study		
Others		25
1. Case Study Presentation	10	
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	10	
6. Discussing Possible Innovations	5	
Term Test and Written Examination		5
Total Duration in Hours		120

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Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

	CE (60% Weightage)			
	SC1 (Term Tests)	**SC2 (Innovative + assignment)**	**SC3 (Written assignment)**	**SEE (Theory) 25%**
	(20 Marks)	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X			X
CO-4	X		X	X
CO-5			X	X

Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Lectures
2.	Understanding	Practical, Tutorials and lectures
3.	Critical Skills	Tutorials, SGD and Assignment
4.	Analytical Skills	Practical , Assignment
5.	Problem Solving Skills	Case studies, SGD
6.	Practical Skills	Practical, OSCE
7.	Group Work	Seminar, SGD
8.	Self-Learning	SGD and assignment
9.	Written Communication Skills	Semester exams, Test and assignment
10.	Verbal Communication Skills	Seminar and SGD
11.	Presentation Skills	Seminar
12.	Behavioral Skills	SGD ,Practical
13.	Information Management	Assignment
14.	Personal Management	Course work
15.	Leadership Skills	Practical , Assignment

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Course Resources

Class notes
Pillai S Ahanatha Manual of Anesthesia for Operation Theater Technicians-2013) Jaypee Publishers
Short Textbook of Anaesthesia Ajay Yadav- 6th edition
Anaesthetic Equipment made easy SAhanatha Pillai
Essentials of Anaesthetic Equipment -4th edition Baha Al Shaikh
The Anaesthesia Technician and Technologists manual-Glen wood worth

Recommended Reading

Magazines and Journals

Websites

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Course Specifications: Specialized Surgery

Course Title	Specialised Surgery
Course Code	AOC306A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

- The course aims to provide the knowledge and understanding of anesthetic and surgical equipment used in the operation theatre, achieve competence in the manipulation of equipment to patient immobilization. Course focuses on the anesthetic techniques, procedures and intensive care in special surgeries.

- It aims to provide the student the intraoperative and postoperative complications and management

Course Size and Credits:

Number of credits	05
Total Hours of Classroom Interaction	45
Number of laboratory Hours	30/30
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 150
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Describe the basic techniques for specialty surgical procedures including , monitoring techniques and equipment

CO2. Explain the positioning of the patient for specialty surgical procedures

CO3. Explain the anesthetic and surgical management of special surgical procedures

CO4 Explain the intraoperative and postoperative complications of general surgery

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Contents

THEORY

Basic technologies in surgery
Advanced technologies in surgery
General Surgery
Biliary tract Procedure
Liver procedure
Pancreatic & splenic procedure
Gastro Intestinal procedure
Amputation
Gynecology & obstetric surgery
Paediatric surgery
ENT procedures
Eye procedures
Cardiovascular & thoracic procedures
Orthopedic procedure
Urology Procedure
Neurology procedure

Practical

- Theatre setting for general surgery
- Theatre setting for gynecology & obstetric
- Theatre settings for ENT
- Ophthalmology Instruments
- Theatre settings for Cardiac procedure
- Orthopedic instruments
- Theatre setting for urology

Theatre setting for neurology procedure

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CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1												2		
CO2	1												2		
CO3	2												3		
CO4	3		2					2					3	2	
CO5	3		1		1			2					3	2	
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		
Demonstrations		15
1. Demonstration using Videos	15	
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		30
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital	30	
Demonstrating analysis using a case study		
Others		25
1. Case Study Presentation	10	
2. Guest Lecture		
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	10	
6. Discussing Possible Innovations	5	
Term Test and Written Examination		
Total Duration in Hours		105

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Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

	CE (60% Weightage)			
	SC1 (Term Tests)	**SC2 (Innovative + assignment)**	**SC3 (Written assignment)**	**SEE (Theory) 25%**
	(20 Marks)	20 Marks	20 Marks	40 Marks
CO-1	X	X		X
CO-2	X	X		X
CO-3	X			X
CO-4	X		X	X
CO-5			X	X

Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Lectures
2.	Understanding	Practical, Tutorials and lectures
3.	Critical Skills	Tutorials, SGD and Assignment
4.	Analytical Skills	Practical , Assignment
5.	Problem Solving Skills	Case studies, SGD
6.	Practical Skills	Practical, OSCE
7.	Group Work	Seminar, SGD
8.	Self-Learning	SGD and assignment
9.	Written Communication Skills	Semester exams, Test and assignment
10.	Verbal Communication Skills	Seminar and SGD
11.	Presentation Skills	Seminar
12.	Behavioral Skills	SGD ,Practical
13.	Information Management	Assignment
14.	Personal Management	Course work
15.	Leadership Skills	Practical , Assignment

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Course Resources

Class notes
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Anaesthetic Equipment made easy SAhanatha Pillai
Essentials of Anaesthetic Equipment -4th edition Baha Al Shaikh
The Anaesthesia Technician and Technologists manual-Glen wood worth

Recommended Reading

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Websites

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SEMESTER 7

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Course Specifications: Internship

Course Title	Internship
Course Code	AOI1401A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

The internship time period provides the students the opportunity to continue to develop confidence and increased skillin simulation and treatment delivery.

Students will demonstrate competence in beginning, intermediate, and advanced procedures in both areas.

Students will participate in advanced and specialized treatment procedures.
The student will complete the clinical training by practicing all the skills learned in classroom and clinical instruction.
The students are expected to work for minimum 8 hours per day and this may be more depending on the need and thehealthcare setting.

8. Course Size and Credits:

Number of credits	10
Total Hours of Classroom Interaction	300
Number of laboratory Hours	300
Number of semester weeks	29
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 150
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

9. Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Demonstrate / assist in setting up of surgical trolleys
CO2. Demonstrate / assist in setting up of Anaesthesia trolley
CO3. Demonstrate / assist in monitoring, connections in Anaesthesia machine and ventilator
CO4 Demonstrate / assist in OT table , Stock checking.
CO5: Checks and assist in patient preparation in various specialties
CO6: Demonstrate / assist in instrument care, washing and CSSD technologies

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Course Contents

THEORY

Internship:

Internship is a phase of training wherein a student is expected to conduct actual practice andacquires skills under supervision so that he or she may become capable of functioning independently.

Intern will rotate in the following areas for the duration mentioned in the following table.

Specialty	credits	Duration in weeks
General Surgery	4	4
Anaesthesia for General Surgery	2	4
Anaesthesia for Obstetrics	3	3
Obstetrics	3	3
Anaesthesia for ENT	2	2
ENT	2	2
Anaesthesia for opthalmology	2	2
Ophthalmology	2	2
Total	20	22

Demonstrate ability to prepare and maintain Operation Theater
Demonstrate ability to maintain equipment support in an acute care environment
Identify and move to maintain a sterile field
Followinfection control policies and procedures
Manage and maintain theater equipment
Demonstrate ability to prepare the patient for operative procedures
Provide intra-operative equipment and technical support
Demonstrate skills and knowledge to assist anesthetist in handling emergencies outside of OT Room
Manage hazardous waste and follow biomedical waste disposal protocols
Ensure availability of medical and diagnostic supplies
Monitor and assure quality
Act within the limits of one's competence and authority
Work effectively with others
Manage work to meet
Maintain a safe, healthy, and secure working
Basics of surgical procedures
Blood Transfusion
General surgicalprocedure and para-surgical equipment
Operating tables: structure, material used, maintenance, control, Hydraulic system and Electrical system.

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Different types of diathermy machine. Monopole, Bipolar, Ligasure, Harmonic Scalpel,CUSA- Principle, hazards, prevention, functioning and maintenance.

Types of operation lights and light sources: Features, Care, cleaning, sterilization and maintenance.

Operation Theatre sterilization- Different recent advances.

LAR/APR--Positioning ofpatient, care-Prevention of hazards.

Total thyroidectomy—with emphasis on proper positioning.

Transthoracic esophagectomy— Different approaches.

Venesection and Tracheostomy.

Laproscopic Cholecystectomy – Pneumoperitonium - Creation andremoving, principles.

Nephrectomy.

Breast surgery.

Requirements during intubation in a case of cervical spine fracture including fiber- optic laryngoscopy, awake intubation, LMA family especially ILMA.

Anaesthetic and surgical requirements during aneurysm surgery.

Surgical and Anaesthetic requirements during micro neurosurgery including types of microscopes, principle, structural features, microscopic photography and cameras used.

Anaesthetic and surgical requirements during thyroid surgery, adrenal surgery.

Anaesthetic and surgical requirements during abdominal surgery including Laproscopic surgery, genitourinary surgery including percutaneous nephrolithotomy, Endoscopic surgery, TURP,TURBT, Lithotripsy, ESWL (Extracorporeal shock wave therapy)

Anaesthetic and surgical requirement during renal transplant donor and recipient surgery including care and precautions during operative procedures of hepatitis B & hepatitis C positive patients.

Anaesthetic and surgicalrequirement during pediatric and Neonatal surgical procedures including emergency procedures like tracheo- esophageal fistula. Sub diaphragmatic hernia, major abdominal and thoracic procedures. Foreign body bronchusand esophagus.

Apparatus and techniques for measuring blood pressure and temperature.

Principle and working of direct/Indirect blood pressure monitoring apparatus.

Intraoperative and postoperative problems and complications of general surgery.

Daily checklist ofanaesthesia drug trolley and anaesthesia equipment

Test for all the connections of the circuits and machines . Ifany defaults report it to senior tech/anaesthetist

Take handover of the case from ward nurse and report it to OT nurse, anaesthetist, and surgeon

CO-PO PSO Mapping

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1												2		
CO2	1												2		
CO3	2												3		
CO4	3		2					2					3	2	
CO5	3		1		1			2					3	2	
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

1. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		
Demonstrations		
1. Demonstration using Videos		
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		340
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital	340	
Demonstrating analysis using a case study		
Others		260
1. Case Study Presentation	20	
2. Guest Lecture	240	
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	10	
6. Discussing Possible Innovations	5	
Term Test and Written Examination		
Total Duration in Hours		600

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Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

Laboratory component CE			SEE
		SC1 Formative laboratory performance/logbook)	SEE
		60 marks	40 (OSPE/OSCE)

Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	
2.	Understanding	Clinical postings
3.	Critical Skills	Clinical postings
4.	Analytical Skills	Clinical postings
5.	Problem Solving Skills	Clinical postings
6.	Practical Skills	Clinical postings
7.	Group Work	Clinical postings
8.	Self-Learning	Clinical postings
9.	Written Communication Skills	Patient orders
10.	Verbal Communication Skills	Clinical postings
11.	Presentation Skills	
12.	Behavioral Skills	Clinical postings
13.	Information Management	
14.	Personal Management	Clinical postings
15.	Leadership Skills	

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Course Resources

Class notes

1. Edna Cornelia Berr Introduction to operating-room technique 4th Edition 1972 McGraw-Hill
2. Atkinson, Lucy Jo .Berry and Kohn's operating room technique. 8th Edition (1996.)St. Louis : Mosby,
3. Eileen Dixon Theatre Technique. 5 edition (1983) W B Saunders Co

Recommended Reading

Arun B Kilpadi Handbook of Operation Theatre Techniques (2004)Jaypee Brothers Medical Publishers (P)Ltd.,

Brigden Raymond John Operating theatre technique : A textbook for nurses, technicians, operatingdepartment assistants, medical students, house surgeons and others associated with the operating theatre.3rd (1974.)Edition Edinburgh : Churchill Livingstone ; New York : distributed by Longman

Eileen Dixon Theatre Technique 5th Edition) W B Saunders Co; 5 edition (June 1, 1983

Pramila Bhalla Textbook For Operation Room Technicians 2ed,(2014)Ahuja Book Publishers &Distributor

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Course Specifications: Research Project

Course Title	Research project
Course Code	AOP401A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

The aim of this course is to give students an experience of addressing a real time problem in Operationtheatre technology.

The students are expected to work in a team of not more than 4 members and are required to develop an appropriate solution by identifying a problem for which a better or new solution is required. The team need to propose a solution / do case study and write a project report.

1. Course Size and Credits:

Number of credits	10
Total Hours of Classroom Interaction	
Number of laboratory Hours	150
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 100
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

2. Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Refine the problem in Allied Health Science
CO2. Identify appropriate methodology to solve the problem
CO3. Propose solutions to the problem identified
CO4 Prepare a project report as per the specified guidelines
CO5: Presentation of the research finding in an appropriate forum

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Course ContentsTHEORY

Identifying a problem for which a better or new solution is required, through literature review or as defined by Biotechnology experts from Industry

Defining the scope of the problem followed by aim and objectives

Identifying the methodology to meet the objectives

Data collection, analysis and interpretation

Propose solution based on data analysis and interpretation (Can be a physical product as well)

Preparing/ writing a project report and presentation in appropriate forum

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CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1												2		
CO2	1												2		
CO3	2												3		
CO4	3		2					2					3	2	
CO5	3		1		1			2					3	2	
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

Course Teaching and Learning Methods

	Teaching and Learning Methods	Duration in hours
1.	Refining Problem, Aim, Objective & Methodology in concurrence with academic guide	35
2.	Review Plan, design and execution of experiments	35
3.	Data collection, Analysis and Interpretation	25
4.	Discussion with supervisor	25
5.	Propose solution	15
6.	Report presentation	10
Total Duration in Hours		150

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Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

Laboratory component CE			SEE
		SC1 (Protocol presentation, Data collection, Analysis)	SEE
		(20+20+20)	40 (Thesis presentation)

Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Project Work
2.	Understanding	Project Work\ Interaction with Supervisor
3.	Critical Skills	Project Work
4.	Analytical Skills	Project Work
5.	Problem Solving Skills	Project Work
6.	Practical Skills	Project Work
7.	Group Work	Project Work
8.	Self-Learning	Project Work
9.	Written Communication Skills	Project Report
10.	Verbal Communication Skills	Examination, Viva-Voce
11.	Presentation Skills	Presentation, Viva-Voce
12.	Behavioral Skills	Project Work
13.	Information Management	Project Report
14.	Personal Management	Project Work
15.	Leadership Skills	

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Course Resources

Gurumani, N., 2006, Research methodology for biological sciences, MJP Publishers.

Recommended Reading

Gurumani, N., 2010, *Scientific Thesis Writing And Paper Presentation*, 1st Edition, MJP Publishers.

Magazines and Journals

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Course Specifications: Internship

Course Title	Internship
Course Code	AOI402A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

The internship time period provides the students the opportunity to continue to develop confidence and increased skillin simulation and treatment delivery.

Students will demonstrate competence in beginning, intermediate, and advanced procedures in both areas.

Students will participate in advanced and specialized treatment procedures.
The student will complete the clinical training by practicing all the skills learned in classroom and clinical instruction.
The students are expected to work for minimum 8 hours per day and this may be more depending on the need and thehealthcare setting.

10. Course Size and Credits:

Number of credits	10
Total Hours of Classroom Interaction	300
Number of laboratory Hours	300
Number of semester weeks	29
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 150
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

11. Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Demonstrate / assist in setting up of surgical trolleys
CO2. Demonstrate / assist in setting up of Anaesthesia trolley
CO3. Demonstrate / assist in monitoring, connections in Anaesthesia machine and ventilator
CO4 Demonstrate / assist in OT table , Stock checking.
CO5: Checks and assist in patient preparation in various specialties
CO6: Demonstrate / assist in instrument care, washing and CSSD technologies

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Course Contents

THEORY

Internship:

Internship is a phase of training wherein a student is expected to conduct actual practice andacquires skills under supervision so that he or she may become capable of functioning independently.

Intern will rotate in the following areas for the duration mentioned in the following table.

Specialty	credits	Duration in weeks
General Surgery	4	4
Anaesthesia for General Surgery	2	4
Anaesthesia for Obstetrics	3	3
Obstetrics	3	3
Anaesthesia for ENT	2	2
ENT	2	2
Anaesthesia for opthalmology	2	2
Ophthalmology	2	2
Total	20	22

Demonstrate ability to prepare and maintain Operation Theater
Demonstrate ability to maintain equipment support in an acute care environment
Identify and move to maintain a sterile field
Followinfection control policies and procedures
Manage and maintain theater equipment
Demonstrate ability to prepare the patient for operative procedures
Provide intra-operative equipment and technical support
Demonstrate skills and knowledge to assist anesthetist in handling emergencies outside of OT Room
Manage hazardous waste and follow biomedical waste disposal protocols
Ensure availability of medical and diagnostic supplies
Monitor and assure quality
Act within the limits of one's competence and authority
Work effectively with others
Manage work to meet
Maintain a safe, healthy, and secure working
Basics of surgical procedures
Blood Transfusion
General surgicalprocedure and para-surgical equipment
Operating tables: structure, material used, maintenance, control, Hydraulic system and Electrical system.
Different types of diathermy machine. Monopole, Bipolar, Ligasure, Harmonic Scalpel,CUSA- Principle, hazards, prevention, functioning and maintenance.
Types of operation lights and light sources: Features, Care, cleaning, sterilization and maintenance.
Operation Theatre sterilization- Different recent advances.
LAR/APR--Positioning ofpatient, care-Prevention of hazards.

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Total thyroidectomy—with emphasis on proper positioning.
Transthoracic esophagectomy— Different approaches.
Venesection and Tracheostomy.
Laproscopic Cholecystectomy – Pneumoperitonium - Creation andremoving, principles.
Nephrectomy.
Breast surgery.
Requirements during intubation in a case of cervical spine fracture including fiber- optic laryngoscopy, awake intubation, LMA family especially ILMA.
Anaesthetic and surgical requirements during aneurysm surgery.
Surgical and Anaesthetic requirements during micro neurosurgery including types of microscopes, principle, structural features, microscopic photography and cameras used.
Anaesthetic and surgical requirements during thyroid surgery, adrenal surgery.
Anaesthetic and surgical requirements during abdominal surgery including Laproscopic surgery, genitourinary surgery including percutaneous nephrolithotomy, Endoscopic surgery, TURP,TURBT, Lithotripsy, ESWL (Extracorporeal shock wave therapy)
Anaesthetic and surgical requirement during renal transplant donor and recipient surgery including care and precautions during operative procedures of hepatitis B & hepatitis C positive patients.
Anaesthetic and surgicalrequirement during pediatric and Neonatal surgical procedures including emergency procedures like tracheo- esophageal fistula. Sub diaphragmatic hernia, major abdominal and thoracic procedures. Foreign body bronchusand esophagus.
Apparatus and techniques for measuring blood pressure and temperature.
Principle and working of direct/Indirect blood pressure monitoring apparatus.
Intraoperative and postoperative problems and complications of general surgery.
Daily checklist ofanaesthesia drug trolley and anaesthesia equipment
Test for all the connections of the circuits and machines . Ifany defaults report it to senior tech/anaesthetist
Take handover of the case from ward nurse and report it to OT nurse, anaesthetist, and surgeon

CO-PO PSO Mapping

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1												2		
CO2	1												2		
CO3	2												3		
CO4	3		2					2					3	2	
CO5	3		1		1			2					3	2	
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

2. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		
Demonstrations		
1. Demonstration using Videos		
2. Demonstration using Physical Models		
3. Demonstration on a Computer		
Numeracy		
1. Solving Numerical Problems		
Practical Work		340
1. Course Laboratory		
2. Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen		
4. Clinical Laboratory		
5. Hospital	340	
Demonstrating analysis using a case study		
Others		260
1. Case Study Presentation	20	
2. Guest Lecture	240	
3. Industry / Field Visit		
4. Brain Storming Sessions		
5. Group Discussions	10	
6. Discussing Possible Innovations	5	
Term Test and Written Examination		
Total Duration in Hours		600

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Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

Laboratory component CE			**SEE**
		SC1 Formative laboratory performance/logbook)	SEE
		60 marks	40 (OSPE/OSCE)

Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	
2.	Understanding	Clinical postings
3.	Critical Skills	Clinical postings
4.	Analytical Skills	Clinical postings
5.	Problem Solving Skills	Clinical postings
6.	Practical Skills	Clinical postings
7.	Group Work	Clinical postings
8.	Self-Learning	Clinical postings
9.	Written Communication Skills	Patient orders
10.	Verbal Communication Skills	Clinical postings
11.	Presentation Skills	
12.	Behavioral Skills	Clinical postings
13.	Information Management	
14.	Personal Management	Clinical postings
15.	Leadership Skills	

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Course Resources

Class notes

4. Edna Cornelia Berr Introduction to operating-room technique 4th Edition 1972 McGraw-Hill
5. Atkinson, Lucy Jo .Berry and Kohn's operating room technique. 8th Edition (1996.)St. Louis : Mosby,
6. Eileen Dixon Theatre Technique. 5 edition (1983) W B Saunders Co

Recommended Reading

Arun B Kilpadi Handbook of Operation Theatre Techniques (2004)Jaypee Brothers Medical Publishers (P)Ltd.,

Brigden Raymond John Operating theatre technique : A textbook for nurses, technicians, operatingdepartment assistants, medical students, house surgeons and others associated with the operating theatre.3rd (1974.)Edition Edinburgh : Churchill Livingstone ; New York : distributed by Longman

Eileen Dixon Theatre Technique 5th Edition) W B Saunders Co; 5 edition (June 1, 1983

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Course Specifications: Research Project

Course Title	Research project
Course Code	AOP402A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

Course Summary

The aim of this course is to give students an experience of addressing a real time problem in Operationtheatre technology.

The students are expected to work in a team of not more than 4 members and are required to develop an appropriate solution by identifying a problem for which a better or new solution is required. The team need to propose a solution / do case study and write a project report.

1. Course Size and Credits:

Number of credits	10
Total Hours of Classroom Interaction	
Number of laboratory Hours	150
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course Marks	Total Marks: 100
Pass Requirement	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

Teaching, Learning and Assessment

2. Course Outcomes (COs)

After undergoing this course students will be able to:

CO1. Refine the problem in Allied Health Science
CO2. Identify appropriate methodology to solve the problem
CO3. Propose solutions to the problem identified
CO4 Prepare a project report as per the specified guidelines
CO5: Presentation of the research finding in an appropriate forum

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Course ContentsTHEORY

Identifying a problem for which a better or new solution is required, through literature review or as defined by Biotechnology experts from Industry

Defining the scope of the problem followed by aim and objectives

Identifying the methodology to meet the objectives

Data collection, analysis and interpretation

Propose solution based on data analysis and interpretation (Can be a physical product as well)

Preparing/ writing a project report and presentation in appropriate forum

CO-PO PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1												2		
CO2	1												2		
CO3	2												3		
CO4	3		2					2					3	2	
CO5	3		1		1			2					3	2	
	3: High Influence, 2: Moderate Influence, 1: Low Influence														

Course Teaching and Learning Methods

	Teaching and Learning Methods	Duration in hours
1.	Refining Problem, Aim, Objective & Methodology in concurrence with academic guide	35
2.	Review Plan, design and execution of experiments	35
3.	Data collection, Analysis and Interpretation	25
4.	Discussion with supervisor	25
5.	Propose solution	15
6.	Report presentation	10
Total Duration in Hours		150

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Course Assessment and Reassessment

The components and subcomponents of course assessment is presented in the Academic Regulations document pertaining to the Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document as well.

The assessment questions are set to test the course learning outcomes. In each component or subcomponent, certain Course Outcomes are assessed as illustrated in the following Table.

Laboratory component CE			SEE
		SC1 (Protocol presentation, Data collection, Analysis)	SEE
		(20+20+20)	40 (Thesis presentation)

Achieving Course Learning Outcomes

The following skills are directly or indirectly imparted to the students in the following teaching and learning methods:

S. No	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Project Work
2.	Understanding	Project Work\ Interaction with Supervisor
3.	Critical Skills	Project Work
4.	Analytical Skills	Project Work
5.	Problem Solving Skills	Project Work
6.	Practical Skills	Project Work
7.	Group Work	Project Work
8.	Self-Learning	Project Work
9.	Written Communication Skills	Project Report
10.	Verbal Communication Skills	Examination, Viva-Voce
11.	Presentation Skills	Presentation, Viva-Voce
12.	Behavioral Skills	Project Work
13.	Information Management	Project Report
14.	Personal Management	Project Work
15.	Leadership Skills	

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Course Resources

Gurumani, N., 2006, Research methodology for biological sciences, MJP Publishers.

Recommended Reading

Gurumani, N., 2010, *Scientific Thesis Writing And Paper Presentation*, 1st Edition, MJP Publishers.

Magazines and Journals

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