



**RAMAIAH  
UNIVERSITY**  
OF APPLIED SCIENCES

**Programme Structure and Course Details  
Of  
B.Sc. (Hons) Optometry  
2024-2028**

**Programme Code: 404**



**Head**

Department of Allied Health Sciences  
S Ramaiah University of Applied Sciences  
Bangalore 560054

**Faculty of Life and Allied Health Sciences  
Department of Allied Health Sciences**



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

# 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 society by 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

## Programme Specifications: B.Sc (Hons) Optometry

Faculty	Faculty of Life and Allied Health Sciences (FLAHS)
Department	Allied Health Sciences
Programme Code	404
Programme Name	B.Sc. (Hons) Optometry
Dean of the Faculty	Dr Soma Chaki
Head of the Department	Dr. Tushar Shaw

1. **Title of the Award:** B.Sc. (Hons) Optometry
2. **Mode of Study:** Full-Time
3. **Awarding Institution/Body:** M.S. Ramaiah University of Applied Sciences, Bangalore (India)
4. **Joint Award:** --
5. **Teaching Institution:** Faculty of Life and Allied Health Sciences, M.S. Ramaiah University of Applied Sciences, Bangalore (India)
6. **Date of Programme Specifications:** June 2024
7. **Date of Programme Approval by the Academic Council of MSRUAS:** June 2023
8. **Next Review Date:** June 2025
9. **Programme Approving Regulatory Body and Date of Approval—**
10. **Programme Accrediting Body and Date of Accreditation—**
11. **Grade Awarded by the Accreditation Body—**
12. **Programme Accreditation Validity—**
13. **Programme Benchmark**
14. **Background and Details of the Programme**

### 14.1 Background and Need

The World Health Organization (WHO) and the International Agency for the Prevention of Blindness (IAPB) launched the global initiative VISION 2020: the Right to Sight to eliminate avoidable blindness and vision impairment. In India, uncorrected refractive error is the second most common cause of blindness and major cause of avoidable vision impairment. There is an enormous scope and need for optometrists not only in India but in other developing countries. A majority of (> 61 %) population in India are reported to wear glasses, contact lenses or other reading or visual aids. India needs more than 40,000 optometrists while there are a little above 9000 qualified professionals

The main job function of an optometrist is to provide specialized vision care. That includes conducting eye examinations and prescribing corrective lenses. Optometrists also identify eye conditions that include near-sightedness, farsightedness, lazy eye, and astigmatism.

In the process of conducting examinations, optometrists are also responsible for diagnosing any diseases or deficiencies in the eye. In addition to prescribing contact lenses and eyeglasses, optometrists can also prescribe vision aids as well as different kinds of vision therapy. Optometrists are not licensed to

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perform eye surgery but form an integral part of eye care team. Optometrists work in private practices, eyewear retail stores; department stores that provide vision care, and numerous types of health care facilities. The demand continues to grow, which has made the field of optometry a rather competitive one.

This innovative competency based curriculum is adopted from the guidelines published by Ministry of Health and Family Welfare, allied health Section 2015- 2016.

A competency-based program is a mix of skills and competencies based on individual or population needs (such as clinical knowledge, patient care, or communication approaches), which is then developed to teach relevant content across a range of courses and settings.

The curriculum is outcome based and imbibes required theoretical concepts and practical skills in the domain. 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 hands on skill abilities and 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 like undergoing rigorous clinical training during studentship, research project and one year internship make the students more versatile generating wide range of opportunities including registering for Master's program. Advanced teaching and learning resources, and experience of the faculty members with their strong connections with health care industry and research organizations make this programme unique. In order to ensure global 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 other countries.

#### **Integrated structure of the curriculum**

This innovative curriculum has been structured in a way such that it facilitates horizontal and vertical integration between disciplines; and bridges the gaps between both theory & 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 to assume 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**

The courses have been designed with a focus on performance-based outcomes pertaining to specialty. The learning goals and objectives of the undergraduate education program are based on the performance expectations. They are articulated as learning goals (why we teach this) and learning objectives (what the students will learn). Using the framework, students will learn to integrate their knowledge, skills and abilities in a hands-on manner in a professional healthcare setting. These learning goals are divided into nine key areas, though the degree of required involvement may differ across various specialties:

1. Clinical care
2. Communication
3. Membership of a multidisciplinary health team

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4. Ethics and accountability at all levels (clinical, professional, personal and social)
5. Commitment to professional excellence
6. Leadership and mentorship
7. Social accountability and responsibility
8. Scientific attitude and scholarship (only at higher level- PhD)
9. Lifelong learning

The aims of the curriculum is to produce optometrists who are

1. Technically and clinically competent
2. Aware of safety issues and the importance of quality assurance
3. Understand the theoretical basis for evidence based practice
4. Effective members of the multidisciplinary team

### 17. Programme Goal

The programme acts as a foundation degree and helps to develop critical, analytical and problem solving skills at first level. The foundation degree makes the graduates employable in health care organizations and also to assume administrative positions in various types of organizations. With additional qualifications and training help the graduates to pursue a career in academics or scientific organizations as a researcher

### 18. Programme Objectives

At the completion of this program, the student should –

**PO-1. Clinical care:** Appraise on the evidence-based practice in Optometry and construct appropriate care regime

**PO-2. Communication:** Discuss the diagnosis and justify the options with the patient, and negotiate appropriate treatment plans in a sensitive manner that is in the patient and society's best interests

**PO-3. Membership of a multidisciplinary health team:** Discuss and communicate with and summarize relevant information to, other stakeholders including members of the healthcare team

**PO-4. Ethics and accountability at all levels:** Describe and apply the basic concepts of clinical ethics to actual cases and situations

**PO-5. Commitment to professional excellence:** Demonstrate respect for each patient's individual rights of autonomy, privacy, and confidentiality

**PO-6. Leadership and mentorship:** Develop leadership in quality improvement and eye care service delivery to enhance the wellbeing of the society and enriched healthcare experience

**PO-7. Social accountability and responsibility:** Assess the eye care determinants at the local, regional and national level and build care modality as per the requirement

**PO-8. Lifelong learning:** Evaluate the need and prioritize lifelong learning as an important outcome across the professional career

  
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## **19. Programme Education Objectives**

**PEO-1:** Provide students with a strong foundation in optometry, to enable them to devise and deliver effective solutions to challenging ocular problems

**PEO-2:** Impart technical skills required to develop innovative solutions as per industry and societal requirements in optometry

**PEO-3:** Impart the required managerial and entrepreneurial skills to enable students to contribute to the eyecare needs of the society

**PEO-4:** Instill human values, social, interpersonal and leadership skills required for professional success in evolving as global professionals

## **20. Programme Specific Outcomes (PSOs)**

At the end of the **BSc (Hons) Optometry** Programme the graduate will be able to:

**PSO-1:** Apply the knowledge in optics, instrumentation, visual psychophysics to develop innovative and safe solutions to challenges in optometry

**PSO-2:** Adapt to technological advancement in instrumentation and diagnostics by upgrading to the Latest design processes in optometry

**PSO-3:** Demonstrate the leadership qualities and strive for the betterment of organization, Environment, and society

**PSO-4:** Demonstrate an understanding of the importance of life-long learning through professional Development, practical training, and specialized certifications

  
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## 21. Programme Structure

### SEMESTER-I

S. No	Code	Course Title	Theory (h/W / S)	Tutorial (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	Health Care Delivery Systems of India	2	0	0	2	50
4	OPC101A	General & Ocular Microbiology	2	0	2	3	100
5	OPC102A	Ocular Anatomy	1	1	0	2	50
6	OPC103A	Geometrical Optics	1	1	2	3	100
7	AHN101A	Language-1 (English)	3	0	0	3	100
<b>Total</b>			13	2	8	19	600
<b>Total number of contact hours per week</b>			<b>23 hours per week</b>				

\*9 hours of SDL

### SEMESTER-II

S. No	Code	Course Title	Theory (h/W / S)	Tutorial (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	OPC104A	Ocular Physiology & Biochemistry	2	1	0	3	100
6	OPC105A	Physical Optics	1	1	2	3	100
7	OPC106A	Ocular Pharmacology	1	1	0	2	50
8	AHD111A	Environmental studies and Health	2	0	0	2	50
<b>Total</b>			14	3	4	19	550

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Total number of contact hours per week		21 hours per week
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\* 11 hours of SDL

#### SEMESTER-III

S. No	Code	Course Title	Theory (h/W/S)	Tutorial (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	OPC201A	Visual Optics I	1	1	0	2	50
2	OPC202A	Optometric Optics I	1	1	0	2	50
3	OPC203A	Ocular Diseases I	1	1	0	2	50
4	OPC204A	Optometric Instruments -1	1	1	0	2	50
5	OPC205A	Clinical Optometry-1	0	2	6	5	100
6		Open Elective-1	2	0	0	2	50
7	AHN202A	Language-2	3	0	0	3	100
Total			9	6	6	18	450
Total number of contact hours per week			21 hours per week				

\*8 hrs of SDL

#### SEMESTER-IV

S. No	Code	Course Title	Theory (h/W/S)	Tutorial (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	OPC207A	Optometric Optics II	1	1	0	2	50
2	OPC206A	Visual Optics II	1	1	0	2	50
3	OPC208A	Ocular Diseases II	1	1	0	2	50
4	OPC209A	Clinical Optometry II	0	3	6	6	100
5	OPC210A	Optometric Instruments-II	1	1	0	2	50
6	AHN203A	Constitution of India	2	0	0	2	50
7	OPC211A	Nutrition	2	0	0	2	50

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8	AHN204A	Professional communications	2	0	0	2	50
9		Open Elective-2	2	0	0	2	50
<b>Total</b>			<b>12</b>	<b>7</b>	<b>6</b>	<b>22</b>	<b>500</b>
<b>Total number of contact hours per week</b>				<b>25 hours per week</b>			

**\* 9 hrs of SDL**

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

#### SEMESTER-V

S. No.	Code	Course Title	Theory (h/W/S)	Tutorial (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	OPC301A	Contact lens I	2	1	0	3	100
2	OPC303A	Low Vision & Geriatric Optometry	1	1	0	2	50
3	OPC302A	Pediatric Optometry & Binocular vision - 1	2	1	0	3	100
5	OPC304A	Systemic Diseases	2	0	0	2	50
6	OPC305A	Clinical Optometry - 3	0	4	6	7	100
7	AHM305A	Project Management	2	0	0	2	50
<b>Total</b>			<b>9</b>	<b>7</b>	<b>6</b>	<b>19</b>	<b>450</b>
<b>Total number of contact hours per week</b>				<b>22 hours per week</b>			

**\* 7 hrs of SDL**

  
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### SEMESTER-VI

S. No	Code	Course Title	Theory (h/W/S)	Tutorial (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	OPC306A	Contact lens II	2	1	0	3	100
2	OPC307A	Binocular Vision II	2	1	0	3	100
3	OPC308A	Public Health and Community Optometry	1	1	0	2	50
4	OPC309A	Occupational Optometry & Practice Management	2	0	0	2	50
5	OPC310A	Clinical Optometry - 4	0	4	6	7	100
6	AHC308A	Research Methodology & Biostatistics	3	0	0	3	100
7	AHN308A	Personality development and soft skills	1	0	2	2	50
<b>Total</b>			<b>11</b>	<b>7</b>	<b>8</b>	<b>22</b>	<b>550</b>
<b>Total number of contact hours per week</b>				<b>26 hours per week</b>			

\* 9 hrs of SDL

### SEMESTER-VII

S. No	Code	Course Title	Theory (h/W/S)	Tutorial (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	OPP401A	Research Project	0	0	20	10	100
2	OPI401A	Internship	0	0	20	10	100
<b>Total</b>			<b>0</b>	<b>0</b>	<b>40</b>	<b>20</b>	<b>200</b>
<b>Total number of contact hours per week</b>				<b>40 hours per week</b>			

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## SEMESTER-VIII

S. No	Code	Course Title	Theory (h/W/S)	Tutorial (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	OPP402A	Research Project	0	0	20	10	100
2	OPI402A	Internship	0	0	20	10	100
<b>Total</b>			<b>0</b>	<b>0</b>	<b>40</b>	<b>20</b>	<b>200</b>
<b>Total number of contact hours per week</b>			<b>40 hours per week</b>				
<b>Maximum Marks</b>			<b>3500</b>				
<b>Total Credits</b>			<b>159</b>				

### Open Elective Courses

A number of open elective courses from Faculty of Mathematical and Physical Sciences, Engineering, Management and Commerce, Art and Design, Hospitality Management and Catering Technology, Pharmacy, Dental Sciences will be announced one semester prior to the scheduled semester. The students can also register through online mode via digital platforms such as NPTEL, swayam, Coursera etc., as per the regulations.

**22. Programme Delivery:** As per the Time-Table.

**23. Teaching and Learning Methods:** The module delivery comprises of a combination of few or all of the following:  
Face to face lectures using audio-visuals

1. Workshops-group discussions, debates, presentations
2. Demonstrations
3. Guest lectures
4. Laboratory-work/Field work/Workshop
5. Hospital postings
6. Seminars
7. Group Exercises

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	Core (DSC) (Credits)	(DSE) / Open Elective (OE) (Credits)	Enhancement Compulsory Courses (AECC) - Languages (Credits) (L+T+P)	Skill based (Credits) (L+T+P)	Value based (Credits) (L+T+P)	credits
I	1. General Anatomy (3) 2. Health Care Delivery System (2) 3. General Microbiology (3) 4. General physiology (3) 5. Ocular Anatomy (2) 6. Geometrical Optics(3)		English for Communication 1 (3)			21
II	1. General Biochemistry (2) 2. General pathology (3) 3. Concepts of Hospital infection prevention (2) 4. General Pharmacology (2) 5. Ocular Physiology and Biochemistry(3) 6. Physical optics (3) 7. Ocular Pharmacology(2)		Environmental Studies (2)			21

8. Project Work

1. Learning methodologies

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III	1. Visual Optics-1(2) 2. Optometric Optics-1(2) 3. Ocular Diseases-1(2) 4. Optometric Instruments I(2) 5. Clinical Optometry(5)	OE1 (2)	English for Communication 2 (3)		SEC-2: AI (2) (1+0+2)	Entrepreneurship (2) (1+0+2)		22
IV	1. Optometric Optics-II(2) 2. Visual Optics-II(2) 3. Ocular Diseases-II(2) 4. Optometric Instruments II(2) 5. Nutrition (2) 6. Clinical Optometry-II(5)	Open Elective - 2 (3)		Constitution of India (2)	SEC-3: Professional communication (2)			23
V	1. Contact Lens-1(3) 2. Low vision & Geriatric Optometry(2) 3. Pediatric Optometry & Binocular Vision-1(3) 4. Systemic Diseases(2) 5. Clinical Optometry(7)			Project Management (2)				23

With a focus on self-directed learning, the curriculum will include a foundation course that focuses on communication, basic computer skills, professionalism, ethics and law. It also incorporates early clinical exposure and directed clinical education during specialty training. It is envisaged that the AHPs should have sufficient clinical exposure integrated with the learning of basic and laboratory sciences. There is an emphasis on the introduction of case scenarios for classroom discussion/case-based learning.

VI	1. Contact Lens –II (3) 2. Binocular Vision –II (3) 3. Public Health and Community Optometry (2) 4. Occupational Optometry & Practice management (2) 5. Clinical Optometry- IV (7) 6. Research Methodology & Biostatistics (3)				SEC-5: Personality Development and Soft Skills (2)(1+0+2)			22
VII	Research Project (10) Internship (10)							20
VIII	Research Project (10) Internship (10)							20
	138 credits	5 credits	6 credits credits	6	6 credits	2 credits	0 credit	172

It is well documented in the literature that teaching and learning of clinical skills occur at the patient's bedside or other clinical areas supplemented by didactic teaching in classrooms and lecture theatres. Our institute has instituted clinical skill centers, laboratories and high-fidelity simulation laboratories to enhance the practice and training for allied and healthcare students and professionals. The skills training center overcomes the shortcoming of patients being used to learn and practice the necessary skills. The use of simulators addresses many issues such as lack of confidence and inadequate skills in handling the equipment. Practice on simulators and with corrective measures students can hone the skills and gain confidence to perform in

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real life situations.

### Teaching and Learning Methods

1. Team teaching/ Integrated teaching
2. Face to Face lectures using audio-visuals
3. Seminars/Journal clubs/e-lectures
4. Case based discussions
5. Group discussions, debates, presentations
6. Demonstrations on videos, computers and models
7. Hospital based learning
8. Laboratory work
9. Dissertation/ Group project work
10. School visits/Outreach centre visits
11. Interdepartmental meets
12. Continuing medical education  
programs/symposiums/workshops  
state/national/international conferences and conventions

## 26. Assessment and Grading

### 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 of CE 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:

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## Theory Courses

The following is the CE components:

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

## Theory + Laboratory Courses

The following is the CE components:

CE (60% weightage)			SEE (40% weightage)	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE(Lab) 10%

In CE there shall be four subcomponents of CE (SC1, SC2, SC3, and SC4), namely Mid Term; Written

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Assignment; Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- p) Online Test
- q) Assignments/Problem Solving
- r) Field Assignment
- s) Open Book Test
- t) Portfolio
- u) Reports
- v) Case Study
- w) Group Task
- x) Laboratory / Clinical Work Record
- y) Computer Simulations
- z) Creative Submission
- aa) Virtual Labs
- bb) Viva / Oral Exam
- cc) Lab Manual Report
- dd) Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva-Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

## **22. Attendance**

A minimum of 80 % attendance is compulsory to appear for semester end examinations.

## **23. Award of degree**

As per the Academic Regulations for B.Sc. (Hons) Optometry Programme

## **24. Student Support for Learning**

Students are given the following support:

- a. Reference Books in the Library
- b. Pre-reads and handouts
- c. Cases/ Case Study and Caselets
- d. Magazines and Journals
- e. Internet Facility

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- f. Computing Facility
- g. Laboratory Facility
- h. Workshop Facility
- i. Staff Support
- j. Lounges for Discussions
- k. Any other support that enhances their learning

## 25. Quality Control Measures

The following are the Quality Control Measures:

1. Review of question papers and assignment at the Department Level
2. Student feedback
3. Opportunities for the students to see their assessed work
4. Review by External Examiners and External Examiners Reports
5. Staff Student Consultative Committee Meetings
6. Student Exit Feedback
7. Subject Assessment Board
8. Programme Assessment Board

## 26. Programme Map (Course-PO-PSO 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	Health Care Delivery Systems of India	1	1	1	2	1		2	1	2			1
1	General Microbiology	2	1	1	2	1				2			

1	Ocular Anatomy												
1	Geometrical Optics	1		1		2			1	2			1
1	English for Communication 1	2	3	2	2	1	1	2	1	1		1	1
2	General Biochemistry	3	1	1		2				3			
2	General Pharmacology	3			2	2				3			1
2	Concepts of Hospital infection prevention	1	1	2	2			2	1	2	2		
2	General Pathology	2		1	1	2			1	2		1	
2	Ocular Physiology & Biochemistry	2	1	1				1	1	3	1		
2	Physical Optics	1				2		1	2	2	2	2	0
2	Environmental Studies	1			1	1		2	2	1		1	
3	Visual Optics I	3	2	1	1	2	1	1	3	2	2	2	
3	Optometric Optics I	3	2	1	1	2	1	1	3	2	2	2	2
3	Ocular Diseases I	3	2	1	1	2	1	1	3	2	2	1	2

3	Ocular Pharmacology	3	2	1	1	2	1	1	3	2	2	1	2
3	Optometric Instruments I	3	1	1	1	2	1	1	2	3	3	1	1
3	Clinical Optometry I	3	2	1	1	2	1	1	2	3	2	2	1
3	English for Communication 2	2	3	2	2	1	1	2	1	1		1	1
4	Optometric Optics II	3	2	1	1	2	1	1	3	2	2	2	2
4	Visual Optics II	3	2	1	1	2	1	1	3	2	2	2	
4	Ocular Diseases II	3	2	1	1	2	1	1	3	2	2	1	2
4	Optometric Instruments II	3	1	1	1	2	1	1	2	3	3	1	1
4	Nutrition	2	2	1	1	1	1	1	1	3	3	2	1
4	Clinical Optometry II	3	2	1	1	2	1	1	2	3	2	2	1
4	OE-2												
4	Constitution of India and Human Rights												
4	Professional communication	2	3	2	2	1	1	2	1	1		1	1
5	Contact lens I	3	2	2	1	3	3	2	3	3	3	2	3
5	Low Vision & Geriatric Optometry	3	2	1	1	2	2	2	2	3	2	3	2

5	Pediatric Optometry & Binocular vision I	3	2	1	1	2	2	2	2	3	2	3	2	
5	Systemic Diseases					1	2	2	2	2	3	2	3	2
5	Clinical Optometry III					1	2	1	1	2	3	2	2	1
5	Project Management					2	2		2	2	2	2		
6	Contact lens II					1	3	3	2	3	3	3	2	3
6	Binocular Vision II					1	2	2	2	2	3	2	3	2
6	Public Health and Community Optometry					1	2	2	2	2	3	2	3	2
6	Occupational Optometry &Practice Management					1	2	2	2	2	3	2	3	2
6	Clinical Optometry IV					1	2	1	1	2	3	2	2	1
6	Research Methodology					3	2	2	3	3	3	3	2	3
6	Personality Development and Soft Skills					1	1	1	2	2	2	2	1	1
7	Research Project					3	2	2	3	3	3	3	2	3
7	Internship					3	3	2	2	3	3	2	3	2
8	Research Project					3	2	2	3	3	3	3	2	3

8	Internship				3	3	2	2	3	3	2	3	2
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution													

## 27. Co-curricular activities

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

## 28. Cultural & Literary activities

To unwind and ignite the creativity, annual cultural festivals are arranged and students are encouraged to participate

## 29. Sports and Athletics

Students are encouraged develop to participate in out-door and in-door games on regular basis

*[Signature]*  
 Head  
 Department of Allied Health Sciences  
 Jamiaiah University of Applied Sciences  
 Bangalore



**Programme Structure and Course Details of B.Sc (Hons) Optometry 2024-2026)**



**B.Sc(Hons)Optometry  
2024-2026**

**SEMESTER 1**

*[Signature]*  
Head  
Department of Allied Health Sciences  
M S Ramaiah University of Applied Sciences  
Bangalore 560054

## Course Specifications: General Anatomy

Course Title	General Anatomy
Course Code	AHD101A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

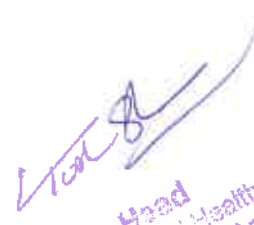
### 1. Course Summary

#### 1. Aim and Summary

The course aims to impart basic knowledge of general human anatomy which forms the basis 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 and early 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.

#### 2. Course Size and Credits:

Number of credits	03
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

  
Head  
Department of Allied Health Sciences  
M S Ramaiah University of Applied Sciences  
Bangalore 560084

### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	Describe the structure and functional organization of a basic human cell and the normal anatomical positions and planes of the body
2.	Explain the structure and functions of basic tissues
3.	Explain the components of the organ systems and its basic functions
4.	Identify the parts of a compound microscope and differentiate microscopy of basic tissues
5.	Demonstrate the parts and position of bones in the human body and early development of fetus
6.	Demonstrate the surface anatomy of structures and interpret data obtained from various imaging techniques.

### 4. Course Contents:

#### 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 Salivary Glands

#### Embryology

- Fertilization and General embryology

#### Osteology

- Axial skeleton (Skull : Cranium, Normas, 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 bones and joints)
- Development of bone (osteogenesis) : Cells involved and various types and stages of Ossification

## Organ systems

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

## Practical

- Compound microscope
- 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
- Demonstration of bones Surface anatomy of all organ system
- Interpretation of Radio images

## 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PSO -1	PSO -2	PSO -3	PSO -4
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												

## 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>12</b>
<b>Demonstrations</b>		
1.Demonstration using Videos	-	
2.Demonstration using Physical Models/ Systems	-	
3. Demonstration on a Computer	-	
<b>Numeracy</b>		
1.Solving Numerical Problems	-	
<b>Practical Work</b>		
1.Course Laboratory	-	
2.Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		
1.Case Study Presentation	04	
2.Guest Lecture	02	
3.Industry/Field Visit	03	
4.Brain Storming Sessions	02	
5. Group Discussions	16	
6.Discussing Possible Innovations	01	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>05</b>
<b>Total Duration in Hours</b>		<b>45</b>

## 7. Method of Assessment

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

CE (60% weightage)			SEE (40% weightage)	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE(Lab) 10%

In CE there shall be four subcomponents of CE (SC1, SC2, SC3), namely Mid Term; Written Assignment; Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a. Online Test
- b. Assignments/Problem Solving
- c. Field Assignment
- d. Open Book Test
- e. Portfolio
- f. Reports
- g. Case Study
- h. Group Task
- i. Laboratory / Clinical Work Record
- j. Computer Simulations
- k. Creative Submission
- l. Virtual Labs
- m. Viva / Oral Exam
- n. Lab Manual Report
- o. Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva-Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

#### 8. Achieving learning outcomes

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

SL.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
15.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

- BD Chaurasia; 2015; **Handbook of General Anatomy**, 5<sup>th</sup> Edition; CBS Publishing.
- IB Singh; 2016; **Textbook of Human Histology**, 8<sup>th</sup> Edition; Jaypee Brothers Medical Publishers.
- IB Singh; 2017; **Human Embryology**, 11<sup>th</sup> Edition; Jaypee Brothers Medical Publishers.
- General Anatomy and Physiology – by DrVenkatesh
- Surface and Radiological Anatomy- with a Clinical Perspective- by DrAshwini C A, 1<sup>st</sup> Edition, Jaypee Publishers, New Delhi

### 2. Recommended Reading

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


## 10. Course Organization

<b>Course</b>		General Anatomy
<b>Course</b>		AHD101A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

Approved by the Academic Council at its 32<sup>nd</sup> meeting held on 22<sup>nd</sup> June 2024

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**Head**  
 Department of Allied Health Sciences  
 M.S. Ramaiah University of Applied Sciences

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

## Course Specifications: General Physiology

Course Title	General Physiology
Course Code	AHD102A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences


### 1. Course Summary

#### 1. Aim and 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 further studies in pharmacology, pathology, pathophysiology and medicine. The mechanisms of deranged function will be appreciated with an in-depth understanding of basic biophysical and physiological 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 class room interaction during the semester	30
Number of practical/tutorial hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

  
Department of Allied Health Sciences  
Faculty of Life and Allied Health Sciences  
Bangalore School of Applied Sciences

### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	Describe the functions of the organ systems in the body
2.	Explain the mechanisms for the execution of these functions for homeostasis through the secretions of chemical and humoral factors
3.	Explain the regulatory mechanisms in the control of blood pressure, urine formation maintenance of extracellular and intracellular volume
4.	Perform to assess the normal values and parameters of the bodily function indicators such as blood indices, blood gases
5.	Demonstrate the tests to assess the functional integrity of the respiratory and cardiovascular system
6.	Correlate the disease condition with physiological aspects of bodily functions

### 4. Course Contents:

#### Blood

Composition and function of blood, blood bank, blood transfusion, erythrocyte sedimentation 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.

### **Special Senses**

Vision - structure of eye. Function of different parts. Hearing structure and function of ear.

Mechanism of hearing. Taste nervous system taste buds functions. Smell physiology, receptors.

### **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, mechanisms of 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 functions of 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 rigor mortis

### **The Skin**

Functions of skin. Body Temperature Measurement, Physiological Variation, Regulation Of Body Temperature By Physical Chemical And Nervous Mechanisms  
.Role Of Hypothalamus, Hypothermia. Wound healing: primary and secondary diseases of skin.

### **Practical**

1. Haemoglobinometry and Calculation Of Blood Indices
2. White Blood Cell Count
3. Red Blood Cell Count
4. Leishman's Staining And Differential WBC Count
5. Determination Of Packed Cell Volume and Determination Of Blood Groups
6. Determination Of Clotting Time, Bleeding Time, Erythrocyte Sedimentation Rate [ESR]
7. Blood Pressure Recording SL
8. Auscultation of Heart Sounds
9. Artificial Respiration SL

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## 10. Pulmonary Function Tests

### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	2			1					2			
CO-2	2								2			
CO-3	2				1				2			
CO-4	2		1		1				2			
CO-5	2								1			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												

### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>14</b>
<b>Demonstrations</b>		
1.Demonstration using Videos	-	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		
1.Solving Numerical Problems	-	
<b>Practical Work</b>		
1.Course Laboratory	-	
2.Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	

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<b>Others</b>		<b>41</b>
1.Case Study Presentation	05	
2.Guest Lecture		
3.Industry/Field Visit	16	
4.Brain Storming Sessions		
5.Group Discussions	19	
6.Discussing Possible Innovations	01	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>05</b>
<b>Total Duration in Hours</b>		<b>60</b>

### 7. Method of Assessment

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

<b>CE (60% weightage)</b>			<b>SEE (40% weightage)</b>	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE(Lab) 10%

In CE there shall be four subcomponents of CE (SC1, SC2, SC3, and SC4), namely Mid Term; Written Assignment; Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60%

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*Handwritten signature*  
 Head  
 Department of Health & Safety  
 Ramdiah Institute of Applied Sciences  
 Bangalore 600054



**Weightage.** Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage of 40% and there will be a 20 marks Viva-Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

#### 8. Achieving learning outcomes

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

Sl.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.	Leadership Skills	Group discussions

#### 9. Course Resources

##### 1. Essential Reading

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

##### 2. 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

#### 10. Course Organization

<b>Course name</b>		General Physiology
<b>Course code</b>		AHD102A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

  
 Department of Health Sciences  
 S. Ramaswami University of Applied Sciences  
 Bangalore 560054

## Course Specifications: Health Care Delivery Systems of India

Course Title	Health Care Delivery Systems of India
Course Code	AHD103A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and 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 class room interaction during the semester	30
Number of practical/tutorial hours	0
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

Head

Department of Allied Health Sciences  
M.S. Ramaiah University of Applied Sciences  
Bangalore 560054

Approved by the Academic Council at its 32<sup>nd</sup> meeting held on 22<sup>nd</sup> June 2024

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

## Teaching, Learning and Assessment

### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	Describe the Health Care delivery system in India at primary, secondary and tertiary level and identify their role in the health care team
2.	Explain the AYUSH system of medicine
3.	Explain the National Health programmes in terms of operation, achievements and constraints
4.	Explain the importance of Demography and Vital statistics in planning health policy
5.	Discuss role of epidemiology and epidemiological methods in health

### 4. Course Contents:

#### Introduction to healthcare delivery system

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

#### National Health Programme

- Background objectives, action plan, targets, operations, achievements and constraints in various National Health Programme

#### Introduction to AYUSH system of medicine

- Introduction to Ayurveda Yoga, naturopathy, unani, siddha and homeopathy Need 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 health policy

#### 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

### 5. Course Map (CO-PO-PSO Map)

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	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PSO -1	PSO -2	PSO -3	PSO -4
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: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												

#### 6. Course Teaching and Learning Methods

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

**Total Duration in Hours****35****7. Method of Assessment**

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

<b>CE (60% weightage)</b>			<b>SEE (40% weightage)</b>
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 25%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

**8. Achieving 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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

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

### 2. Recommended Reading

- Park's Textbook of Preventive and Social Medicine - K. Park - 22nd Edition - Bhanot Publishers
- Oxford Textbook of Public Health - Roger Detels - 5th Edition - Oxford University Press
- National Health Programs of India - J Kishore - 12th Edition - Century Publications


## 10. Course Organization

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

<b>Course</b>		Health Care Delivery Systems of India
<b>Course</b>		AHD103A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

  
 Head of Department  
 Department of Health Sciences  
 M S Ramaiah University of Applied Sciences  
 Bangalore 560054



## Course Specifications: General & Ocular Microbiology

Course Title	General & Ocular Microbiology
Course Code	OPC101A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and 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 dispatch 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 class room interaction during the semester	30
Number of practical/tutorial hours	30
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	Describe the morphology, physiology and characteristics of microorganisms
2.	Describe the principles and practice of sterilization and disinfection
3.	Discuss immunology, and immunity
4.	Demonstrate sterilization procedures and use of sterilization equipment
5.	Demonstrate Collection and transport of specimens to the laboratory

### 4. 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 media and 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 and types of Infectious disease. Immunity. Structure and functions of Immune system. The Complement System. Antigen. Immunoglobulins - Antibodies - General structure and the role played in defence mechanism of the body. Immune response. Antigen - Antibody reactions - with reference to clinical utility. And Hypersensitivity reactions.

#### 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 about

Viruses:

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, blood agar, chocolate agar, MacConkey medium, LJ 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.

#### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PSO -1	PSO -2	PSO -3	PSO -4
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: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												

#### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>24</b>
<b>Demonstrations</b>		
1.Demonstration using Videos	-	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		
1.Solving Numerical Problems	-	
<b>Practical Work</b>		
1.Course Laboratory	16	
2.Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	<b>26</b>
4.Clinical Laboratory	05	
5.Hospital	05	
6.Model Studio	-	
<b>Others</b>		<b>02</b>

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1. Case Study Presentation	02	
2. Guest Lecture	-	
3. Industry/Field Visit	-	
4. Brain Storming Sessions	-	
5. Group Discussions	-	
6. Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>08</b>
<b>Total Duration in Hours</b>		<b>60</b>

## 7. Method of Assessment

<b>CE (60% weightage)</b>			<b>SEE (40% weightage)</b>	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE(Lab) 10%

In CE there shall be four subcomponents of CE (SC1, SC2, SC3), namely Mid Term; Written Assignment; Innovative assignments; and Laboratory performance assessment. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a. Online Test
- b. Assignments/Problem Solving
- c. Field Assignment
- d. Open Book Test
- e. Portfolio
- f. Reports
- g. Case Study
- h. Group Task
- i. Laboratory / Clinical Work Record
- j. Computer Simulations
- k. Creative Submission
- l. Virtual Labs
- m. Viva / Oral Exam
- n. Lab Manual Report
- o. Any other

After the four subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. Laboratory/Practical shall be shifted as part of CE. The lab component as part of CE will have external examiner evaluation and marks listed separately for industry requirements. For a theory + laboratory course, the Semester End Examination shall be a 2-hour theory paper of 50 marks with a

weightage of 40% and there will be a 20 marks Viva-Voce. In summary, the ratio of Formative (Continuous Evaluation-CE) Vs Summative (Semester End Examination-SEE) should be 60:40.

### 8. Achieving 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.	Leadership Skills	Group discussions

Department of Microbiology  
M.S. Ramaiah University of Applied Sciences  
Bangalore 560054

### 9. Course Resources

#### 1. 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.

#### 2. Recommended Reading

- Apurba S. Sastry & Sandhya Bhat K; Essentials of medical Microbiology. Jaypee. The health Sciences Publisher

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Bangalore - 560 054

#### 10. Course Organization

<b>Course name</b>		General & Ocular Microbiology
<b>Course code</b>		OPC101A
<b>Course Leader/s Name</b>		Dr. Tushar Shaw
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

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**Head**  
Department of Allied Health Sciences  
M.S. Ramiah Medical College  
Bengaluru

## Course Specifications: Ocular Anatomy

Course Title	Ocular Anatomy
Course Code	OPC102A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

This course deals with detailed anatomy of the orbit, eyeball and cranial nerves associated with ocular functions. At the end of the course, the student should be able to comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of various structures in the eye and adnexa. Identify the microscopic structures of various tissues in the eye and correlate the structure with the functions.

#### 2. Course Size and Credits:

Number of credits	02
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	0
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

Head  
Department of Allied Health Sciences  
Teaching, Learning and Assessment

#### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

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No.	Course outcome
1.	Describe the basic structure, relations and components of the human eye
2.	Describe the connections between the various parts of the central nervous system and the eye so as to understand the neural connections and distribution
3.	Describe the basic principles of ocular embryology
4.	Describe the orbital structures

#### 4. Course Contents:

- Introduction to Ocular Anatomy
- Orbit
- Ocular Adnexa & Lacrimal system
- Conjunctiva, Sclera & Limbus
- Cornea
- Anterior Chamber & Aqueous humor
- Uvea
- Crystalline Lens
- Retina
- Ocular Embryology
- Extra ocular Muscles
- Blood Supply to the eye ball
- Cranial Nerves

#### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	2								2			
CO-2		3										3
CO-3				3				3	2		3	
CO-4					2			3		3		3

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		15
Demonstrations		05
1.Demonstration using Videos	05	

2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		
1.Solving Numerical Problems	-	
<b>Practical Work</b>		
1.Course Laboratory	-	
2.Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		
1. Case Study Presentation	3	<b>10</b>
2.Guest Lecture	5	
3.Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	2	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>05</b>
<b>Total Duration in Hours</b>		<b>35</b>

#### 7. Method of Assessment

<b>CE (60% weightage)</b>			<b>SEE (40% weightage)</b>
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio

- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

- L A Remington: Clinical Anatomy of the Visual System, Second edition, Elsevier Butterworth Heinemann, Missouri, USA, 2002

## 10. Course Organization

<b>Course name</b>		Ocular Anatomy
<b>Course code</b>		OPC102A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

  
**Head**  
Department of Allied Health Sciences  
M S Ramaiah University of Applied Sciences  
Bangalore - 560 054

## Course Specifications: Geometrical Optics

Course Title	Geometrical Optics
Course Code	OPC103A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

The aim of this course is to impart basic concepts of Optics and its application to solve medical problems. The students are taught the basic topics in optics which include study of light and its behavior as it propagates in a variety of media. Reflections at plane and spherical surfaces and refractions at plane, spherical, cylindrical and toric surfaces will be discussed.

#### 2. Course Size and Credits:

Number of credits	3
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	30
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

#### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course Outcomes
-----	-----------------

1.	Explain the basic concepts in reflection, refraction, and scattering of light
2.	Describe concepts in mirrors, lenses
3.	Describe basic properties of image formation by lenses
4.	Conduct experiments as per the standard procedures and tabulate the measured values
5.	Calculate the required parameters and plot the results
6.	Interpret, compare with standard results and draw conclusions

#### 4. Course Contents:

Nature of light –light as electromagnetic wave; amplitude and phase; speed of light in vacuum and other media; refractive index.

Wavefronts–spherical, elliptical and plane; Curvature and vergence; rays; convergence and divergence in terms of rays and vergence; vergence at a distance

Refractive index:its dependence on wavelength;Fermat's and Huygen's Principle- Derivation of laws of reflection and refraction (Snell's law) from these principles;

Plane mirrors –height of the mirror; rotation of the mirrorReflection by a spherical mirror –paraxial approximation; sign convention;

Spherical mirrors and Prism: Imaging by concave mirror, convex mirror;Reflectivity; transmissivity; Glass slab-displacement without deviation; Definition of a lens as a combination of two surfaces; different types of lens shapes; displacement without dispersion

Thick prisms: angle of prism; deviation produced by a prism; refractive index of the prism Prisms; angular dispersion; dispersive power; Abbe's number. Definition of crown and flint glasses; materials of high refractive index

Thin prism –definition; definition of Prism diopter; deviation produced by a thin prism; it dependence on refractive index;Refraction by a spherical surface; sign convention;

Introduction to spherical aberration using image formed by a spherical surface of a distance object; sag formula;Paraxial approximation; derivation of vergence equation;imaging by a positive powered surface and negative powered surfaceVergence at a distance formula;

Lenses and combinations:

Image formation -1:Image formation by a lens by application of vergence at a distance formula; definitions of front and back vertex powers; equivalent power; first and second principal planes/points; primary and secondary focal planes/points; primary and secondary focal lengths, linear magnification; angular magnification; Nodal Planes: Thin lens as a special case of thick lens; review of sign convention.

Image formation-2: Imaging by a thin convex lens; image properties (real/virtual; erect/inverted; magnified/minified) for various object positions-Imaging by a thin concave lens; image properties (real/virtual; erect/inverted; magnified/minified) for various object positions; Prentice's Rule-System of two thin lenses; review of front and back vertex powers and equivalent power, review of six cardinal points. System of more than two thin lenses; calculation of equivalent power using magnification formula.

### Physics Laboratory

Thick Prism – determination of prism angle and dispersive power; calculation of the refractive index;Thin Prism – measurement of deviation; calculation of the prism diopter;Image formation by spherical mirrors;Convex lens - power determination using lens gauge, power determination using distant object method; power determination using the vergence formula;Concave lens – in combination with a convex lens – power determination

### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	P O- 1	P O- 2	PO -3	PO -4	PO -5	PO -6	PO -7	P O- 8	PS O-1	PS O-2	PSO -3	PSO- 4
CO-1	3	2						2	3	2		1
CO-2	3	1						1	3	2		1
CO-3	3							1	3	2		1
CO-4	3		1					1	3	2		1
CO-5	2							1	2	1		1
CO-6	3		1					1	3	2		1
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												

### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		15
Demonstrations		5
1.Demonstration usingVideos	3	
2.Demonstration using Physical/Models/Systems	2	
3.Demonstration on a Computer	-	
Numeracy		



1.Solving Numerical Problems	-	
<b>Practical Work</b>		
1.Course Laboratory	30	
2.Computer Laboratory		
3. Engineering Workshop/Course Workshop/Kitchen	-	<b>30</b>
4.ClinicalLaboratory	-	
5.Hospital	-	
6.ModelStudio	-	
<b>Others</b>		
1.Case Study Presentation	-	
2.GuestLecture	-	
3. Industry/Field Visit	-	
4.Brainstorming Sessions	-	<b>05</b>
5.Group Discussions	5	
6.Discussing Possible Innovations	-	
<b>Term Tests and Written Examination</b>		<b>05</b>
<b>Total Duration in Hours</b>		<b>60</b>

#### 7. Method of Assessment

CE (60% weightage)			SEE (40% weightage)	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE(Lab) 10%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The Innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission

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- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

#### 9. Course Resources

##### 1. Essential Reading

2. Recommended Reading
3. Magazines and Journals
4. Websites

#### 10. Course Organization

<b>Course Title</b>		Geometric Optics
<b>Course Code</b>		OPC103A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

*[Signature]*  
 Department of Health Sciences  
 M.S. Ramaiah University of Applied Sciences  
 Bangalore - 560054

## Course Specifications: General Biochemistry

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

### 1. Course Summary

#### 1. Aim and 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 class room interaction during the semester	30
Number of practical/tutorial hours	00
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	Describe the various laboratory apparatus used, the steps in specimen collection and safety measurements to be taken in biochemistry laboratory
2.	Explain different models of atomic structure, acids, bases, buffers and disturbances in acid base balance
3.	Explain quality control, precision, specificity, sensitivity when conducting special investigations
4.	Demonstrate qualitative and quantitative estimations of various analyses (urine, blood)
5.	Interpret the various biochemical parameters in health and disease

### 4. Course Contents:

#### 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 of glass 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 electrical balances.

#### Safety of measurements & Conventional and SI units

#### Dilutions

**Acids & Bases****Acid- base indicator Theory****Quality control****5. Course Map (CO-PO-PSO Map)**

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PSO -1	PSO -2	PSO -3	PSO -4
<b>CO-1</b>		1	1		2				2			
<b>CO-2</b>					2				2			
<b>CO-3</b>	1				2				2			
<b>CO-4</b>	2				2				3			
<b>CO-5</b>	2				2				2			
<b>CO-6</b>	3				2				2			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												

**6. Course Teaching and Learning Methods**

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>25</b>
<b>Demonstrations</b>		<b>05</b>
1. Demonstration using Videos	05	
2. Demonstration using Physical Models/ Systems	-	
3. Demonstration on a Computer	-	
<b>Numeracy</b>		
1. Solving Numerical Problems	-	
<b>Practical Work</b>		
1. Course Laboratory	-	
2. Computer Laboratory	-	
3. Engineering Workshop/Course/Workshop/Kitchen	-	
4. Clinical Laboratory	-	
5. Hospital	-	
6. Model Studio	-	
<b>Others</b>		

1.Case Study Presentation	-	
2.Guest Lecture	-	
3.Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5. Group Discussions		
6.Discussing Possible Innovations		
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>05</b>
<b>Total Duration in Hours</b>		<b>35</b>

## 7. Method of Assessment

<b>CE (60% weightage)</b>			<b>SEE (40% weightage)</b>
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

## 8. Achieving learning outcomes

Approved by the Academic Council at its 32th meeting held on 22<sup>nd</sup> June 2024

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*Test-8*  
 Department of Allied Health Sciences  
 M S Ramaiah University of Applied Sciences  
 Bangalore 560054

*[Signature]*  
 Dean - Academics  
 M.S. Ramaiah University of Applied Sciences  
 Bangalore - 560 054



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

SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

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

### 2. Recommended Reading

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

- Teitz, Fundamentals of clinical chemistry 6th edition

### 3. Magazines and Journals

- Journal of clinical chemistry and laboratory medicine
- Indian journal of medical biochemistry

### 10. Course Organization

<b>Course Title</b>		General Biochemistry
<b>Course Code</b>		AHD107A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

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 Department of Health Sciences  
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*Handwritten signature*  
 Dean - Academics  
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 Bangalore - 560054

## 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

#### 1. Aim and 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 of various 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 class room interaction during the semester	30
Number of practical/tutorial hours	00
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

#### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	Describe pharmacokinetic principles in relation to drug administration
2.	Explain the concept of pharmacodynamics in relation to drug utilization in therapeutics
3.	Explain the concept of chemotherapy in relation to infectious diseases
4.	Explain the importance of adverse effects in therapeutics of various drug usage
5.	Identify drugs dosage forms and posology in management of diseases and calculate doses in various age groups
6.	Interpret the importance of drug combinations with reference to therapeutic index and drug utilization

#### 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 Factors modifying 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 in insomnia, Sedatives and hypnotics

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

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

#### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	2			2	2				2			
CO-2	2			1	2				2			
CO-3	2				2				2			
CO-4	3				2			1	3			1
CO-5	2				2			1	2			1

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

## 6. Course Teaching and Learning Methods

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

## 7. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.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

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11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. 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.

### 2. Recommended Reading

- Lippincott's Illustrated Reviews: Pharmacology, 5th edition, by Richard A. Harvey and Pamela C. Champe, Lippincott Williams & Wilkins Publisher
- Katzung's Basic and Clinical Pharmacology 13th edition. Lange Publication.

### 3. Magazines and Journals Websites

## 10. Course Organization

<b>Course</b>		General Pharmacology
<b>Course</b>		AHD108A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026



## Course Specifications: Concepts of Hospital Infection Prevention

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

### 1. Course Summary

#### 1. Aim and Summary

The aim of the course is to help students understand the basic concepts of quality in health Care 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	02
Total hours of class room interaction during the semester	30
Number of practical/tutorial hours	
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

## Teaching, Learning and Assessment

### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	Explain the steps involved in infection prevention and control
2.	Understand the working and application of CSSD
3.	Explain the importance of antibiotic resistance in the patient care and ways to prevent it
4.	Apply the concepts of biomedical waste management to ensure clean and hazard free hospital environment

### 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 & methods of 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 an effective 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 working of CSSD

### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PSO -1	PSO -2	PSO -3	PSO -4
CO-1				3			3		3		1	
CO-2				1	3		1		3			
CO-3				1	3		1		3			
CO-4					3		1		3			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												

### 6. 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/ Systems	-	
3.Demonstration on a Computer	-	
Numeracy		10
1.Solving Numerical Problems	-	
Practical Work		
1.Course Laboratory	-	
2.Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	10	
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	-	

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<b>Written Examination (Mid-Term tests and SEE)</b>	<b>05</b>
<b>Total Duration in Hours</b>	<b>37</b>

## 7. Method of Assessment

<b>CE (60% weightage)</b>			<b>SEE (40% weightage)</b>
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

## 8. Achieving learning outcomes

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

Approved by the Academic Council at its 32<sup>nd</sup> meeting held on 22<sup>nd</sup> June 2024

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SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

- Class notes
- Essentials of Hospital Infection Control by Apurba Shastri

## 10. Course Organization

<b>Course name</b>		Concepts of Hospital infection prevention
<b>Course code</b>		AHD109A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

## Course Specifications: General Pathology

<b>Course Title</b>	General Pathology
<b>Course Code</b>	AHD110A
<b>Department</b>	Allied Health Science
<b>Faculty</b>	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and 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 student will 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 class room interaction during the semester	30
Number of practical/tutorial hours	30
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

#### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:



No.	Course outcome
1.	Describe basic facts and concepts of pathology
2.	Explain fundamental aspects of hematology and blood banking
3.	Explain the various clinical pathology tests
4.	Perform laboratory tests related to hematology and clinical pathology
5.	Interpret the results of laboratory tests
6.	Apply concepts of general pathology to understand pathological basis of disease

#### 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 phase proteins.

Tissue repair, regeneration and hemodynamic disorders: Cutaneous wound healing-Pathologic aspects of repair-Hypertemia 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. Section cutting. 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 sedimentation rate (ESR), bleeding time, 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. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PSO -1	PSO -2	PSO -3	PSO -4
<b>CO-1</b>	1				1				2			
<b>CO-2</b>	1		1	1					2			
<b>CO-3</b>	2				2				2			
<b>CO-4</b>	2		1		2				2			
<b>CO-5</b>	2			1					2			
<b>CO-6</b>	2		1		2			1	2		1	

#### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>25</b>
<b>Demonstrations</b>		
1.Demonstration using Videos	05	
2.Demonstration using Physical/Models/Systems	-	
3.Demonstration on a Computer	-	
<b>Practical Work</b>		<b>15</b>
1.Conducting demo interviews and focus group discussion	15	
2.Computer lab (software demonstration)	-	
3.Demonstrating analysis using a case study	-	
<b>Others</b>		
1.Case Study Presentation		
2.Brain Storming Sessions		
3.Group Discussions		
4.Discussing Possible Innovations		
<b>Written Examination</b>		<b>10</b>

<b>Total Duration in Hours</b>	<b>55</b>
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### 7. Method of Assessment

CE (60% weightage)			SEE (40% weightage)	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE(Lab) 10%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

### 8. Achieving learning outcomes

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

SL.no	Curriculum and Capabilities Skills	How imparted during the course
-------	------------------------------------	--------------------------------

Approved by the Academic Council at its 32th meeting held on 22<sup>nd</sup> June 2024

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*[Signature]*  
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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.	Leadership Skills	Group discussions

#### 9. Course Resources

##### 1. 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


##### 2. 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.

#### 10. Course Organization

<b>Course name</b>	General Pathology
<b>Course code</b>	AHD110A

<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

  
**Head**  
 Department of Allied Health Sciences  
 M S Ramaiah University of Applied Sciences  
 Bangalore 560054

## Course Specifications: Ocular Physiology & Biochemistry

Course Title	Ocular Physiology & Biochemistry
Course Code	OPC104A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

Ocular physiology deals with the physiological functions of each part of the eye. This course will enable the student to understand the normal physiological growth and development of the eye, and function of various muscles of the eye. They will be exposed to methods of assessing normal functioning of the eye. They will learn the basics of pathology that can affect vision and their remedies. Ocular Biochemistry deals with the metabolism that takes place in the human body. It also deals with ocular biochemistry in detail.

#### 2. Course Size and Credits:

Number of credits	03
Total hours of class room interaction during the semester	30
Number of tutorial hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

#### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

Approved by the Academic Council at its 32th meeting held on 22<sup>nd</sup> June 2024

No.	Course outcome
1.	Describe the normal functioning of all structures of the eye and their interactions
2.	Elucidate the physiological aspects of normal growth and development of the eye
3.	Explain the phenomenon of vision
4.	Demonstrate knowledge and understanding on metabolic processes taking place in different ocular structures
5.	Describe in a general outline the nature and functions of selected biomolecules involved as structural elements in eye tissues
6.	Describe the maintenance of ocular transparency

#### 4. Course Contents:

##### Ocular Physiology

- Protective mechanisms in the eye: Eye lids and lacrimation, description of the globe
- Extrinsic eye muscles, their actions and control of their movements
- Coats of the eye ball
- Corneal Physiology
- Aqueous humor and vitreous: Intra ocular pressure
- Iris and pupil
- Crystalline lens and accommodation – presbyopia
- Retina – structure and functions
- Vision – general aspects of sensation
- Visual acuity, Vernier acuity and principle of measurement
- Visual perception – Binocular vision, stereoscopic vision, optical illusions
- Visual pathway, central and cerebral connections
- Ocular, movements and saccades

##### Ocular Biochemistry

- Tear film: Composition
- Cornea: Biochemical composition of all layers, corneal metabolism – nutrient uptake, metabolic pathways, barrier functions
- Lens: Biochemical composition, glucose utilization- sorbitol pathways, Glutathione and ascorbic acid transport. Cataract formation: aging changes
- Aqueous Humor: Composition
- Vitreous Humor: Composition
- Retina: Pigment epithelium-structure-composition, photoreceptor cells; Vitamin A- retinal function and metabolism

### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	3	1						2	3	2		1
CO-2	3	2			1			2	3	2		1
CO-3	3	1			1		1	2	3	2		1
CO-4	3	1			1		1	1	3	2		1
CO-5	3	3	1		2		1	2	3	2		1
CO-6	3	3	1		2		1	2	3	2		1
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												

### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>30</b>
<b>Demonstrations</b>		<b>05</b>
1.Demonstration using Videos	05	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		<b>10</b>
1.Solving Numerical Problems	-	
<b>Practical Work</b>		
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		<b>10</b>
1.Case Study Presentation	03	
2.Guest Lecture	02	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	



5.Group Discussions	5	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>05</b>
<b>Total Duration in Hours</b>		<b>50</b>

## 7. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

## 8. Achieving learning outcomes

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

Approved by the Academic Council at its 32<sup>nd</sup> meeting held on 22<sup>nd</sup> June 2024

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Ramiah University of Applied Sciences  
Bangalore 560054

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Bangalore - 560 054

SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

- AK Khurana, Indu Khurana: Anatomy and Physiology of Eye, Second edition, CBS Publishers, New Delhi, 2006
- RD Ravindran: Physiology of the eye, Arvind eye hospitals, Pondicherry, 2001
- PL Kaufman, A Alm: Adler's Physiology of the eye clinical application, 10th edition, Mosby, 2002

### 10. Course Organization

<b>Course name</b>		Ocular Physiology & Biochemistry
<b>Course code</b>		OPC104A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

## Course Specifications: Physical Optics

Course Title	Physical Optics
Course Code	OPC105A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

The aim of this course is to equip the students with a thorough knowledge of properties of light. At the end of this course, students will be able to predict the distribution of light under various conditions.

#### 2. Course Size and Credits:

Number of credits	03
Total hours of class room interaction during the semester	30
Number of practical hours	30
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 100
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

#### Teaching, Learning and Assessment

#### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	Describe the nature of light and its sources

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2.	Elucidate the relationship between amplitude and intensity
3.	Explain the principles and theory of lasers
4.	Explain various units of light measurement and describe the laws of photometry
5.	Demonstrate birefringence using Calcite crystals and measure the resolving power of telescopes
6.	Determine the Gratings

#### 4. Course Contents:

**Nature of light** –light as electromagnetic oscillation –wave equation; ideas of sinusoidal oscillations –simple harmonic oscillation; transverse nature of oscillation; concepts of frequency, wavelength, amplitude and phase.

**Sources of light; Electromagnetic Spectrum.**

**Polarized light; linearly polarized light; and circularly polarized light. Intensity of polarized light; Malus' Law; polarizers and analyzers; Methods of producing polarized light; Brewster's angle.**

**Birefringence; ordinary and extraordinary rays.**

**Relationship between amplitude and intensity.**

**Coherence; interference; constructive interference, destructive interference; fringes; fringe width.**

**Double slits, multiple slits, gratings.**

**Diffraction; diffraction by a circular aperture; Airy's disc**

**Resolution of an instrument (telescope, for example); Rayleigh's criterion Scattering; Rayleigh's scattering; Tyndall effect.**

**Fluorescence and Phosphorescence**

**Basics of Lasers –coherence; population inversion; spontaneous emission; Einstein's theory of lasers.**

**Radiometry; solid angle; radiometric units; photopic and scotopic luminous efficiency and efficacy curves; photometric units**

**Inverse square law of photometry; Lambert's law.**

**Other units of light measurement; retinal illumination; Trolands**

#### **Physical Optics Practicals**

- Gratings – determination of grating constant using Sodium vapour lamp; determination of wavelengths of light from Mercury vapour lamp
- Circular Apertures–measurements of Airy's disc for apertures of various sizes
- Verification of Malus' Law using a polarizer – analyzer combination
- Measurement of the resolving power of telescopes.
- Newton's rings

#### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)	Programme Specific Outcomes (PSOs)
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	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	3							2	3	2	1	2
CO-2	3							1	3	2		1
CO-3	3		1					1	3	2		1
CO-4	3		1					1	3	2		1
CO-5	2							1	2			1
CO-6	3							1	2	1		1

#### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>15</b>
<b>Demonstrations</b>		
1.Demonstration using Videos	-	
2. Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		
1. Solving Numerical Problems	-	
<b>Practical Work</b>		
1.Course Laboratory	30	
2.Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	<b>30</b>
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		
1.Case Study Presentation	-	
2.Guest Lecture	-	
3.Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	-	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>05</b>
<b>Total Duration in Hours</b>		<b>50</b>

## 7. Method of Assessment

CE (60% weightage)			SEE (40% weightage)	
SC1 (Term Tests) 30%	SC2 (Innovative+ Lab assignment) 10%	SC3 (Written+ Lab assignment) 20%	SEE (Theory) 30%	SEE(Lab) 10%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

## 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

#### 9. Course Resources

1. Essential Reading
2. Recommended Reading
3. Magazines and Journals
4. Websites

#### 10. Course Organization

<b>Course name</b>		Physical Optics
<b>Course code</b>		OPC105A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026



## Course Specifications: Ocular Pharmacology

Course Title	Ocular Pharmacology
Course Code	OPC106A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

This course covers the actions, uses, adverse effects and mode of administration of drugs, especially related to eyes.

#### 1. Aim and Summary

#### OBJECTIVES:

At the end of the course the students will acquire knowledge in the following aspects-

1. Basic principle of pharmacokinetics & Pharmacodynamics
2. Commonly used ocular drugs, mechanism, indications, contraindications, drug dosage and adverse effects.

### 2. Course Size and Credits:

Number of credits	2
Total hours of class room interaction during the semester	30
Number of practical hours	00
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50 The distribution of marks for theory and laboratory/clinical component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	Describe the basic principle of pharmacokinetics & Pharmacodynamics
2.	List the commonly used ocular drugs
3.	Describe the mechanism of action of the drugs
4.	List the indications and contraindications of drugs
5.	Discuss about the drug dosage and adverse effects
6.	Describe the drugs commonly used in ophthalmology

### 4. Course Contents:

- General Pharmacology: Introduction & sources of drugs, Routes of drug administration,
- Pharmacokinetics (emphasis on ocular pharmacokinetics),
- Pharmacodynamics & factors modifying drug actions
- Systemic Pharmacology: Autonomic nervous system: Drugs affecting pupillary size and light reflex, Intraocular tension, Accommodation; Cardiovascular system: Anti- hypertensive sand drugs useful in Angina; Diuretics: Drugs used in ocular disorders; Central Nervous System: Alcohol, sedative hypnotics, General & local anaesthetics, Opioids & non-opioids; Chemotherapy : Introduction on general chemotherapy, Specific chemotherapy –Antiviral, antifungal, antibiotics; Hormones : Corticosteroids, Anti diabetics; Blood Coagulants
- Ocular Pharmacology: Ocular preparations, formulations and requirements of an ideal agent; Ocular Pharmacokinetics, methods of drug administration & Special drug delivery system; Ocular Toxicology
- Diagnostic & Therapeutic applications of drugs used in Ophthalmology: Diagnostic Drugs & biological agents used in ocular surgery, Anaesthetics used in ophthalmic procedures, Anti-glaucoma drugs; Pharmacotherapy of ocular infections –Bacterial, viral, fungal & chlamydial; Drugs used in allergic, inflammatory& degenerative conditions of the eye; Immune modulators in Ophthalmic practice, Wetting agents & tear substitutes, Antioxidants

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Bangalore - 560 054

### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	3	2	1		1			1	3	2		1
CO-2	3	1	1		1			2	3	1		1
CO-3	3	1	1		1			1	3	1		1
CO-4	3	2	1		2			2	3	2		1
CO-5	3	1	1		2			2	3	1		1
CO-6	3	2	2		1			2	3	2		1

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>15</b>
<b>Demonstrations</b>		<b>00</b>
1.Demonstration using Videos	00	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	<b>00</b>
<b>Numeracy</b>		
1.Solving Numerical Problems	-	
<b>Practical Work</b>		
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		<b>10</b>
1.Case Study Presentation	05	
2.Guest Lecture	05	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	-	
6.Discussing Possible Innovations	-	

<b>Written Examination (Mid-Term tests and SEE)</b>	<b>05</b>
<b>Total Duration in Hours</b>	<b>30</b>

#### 7. Method of Assessment

<b>CE (60% weightage)</b>			<b>SEE (40% weightage)</b>
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

<b>SL.no</b>	<b>Curriculum and Capabilities Skills</b>	<b>How imparted during the course</b>
1.	Knowledge	Class room lectures

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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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

- K D Tripathi: Essentials of Medical Pharmacology. 5th edition, Jaypee, New Delhi, 2004
- Ashok Garg: Manual of Ocular Therapeutics, Jaypee, New Delhi, 1996

### Recommended reading:

- T J Zimmerman, K S Kooner : Text Book of Ocular Pharmacology, Lippincott-Raven, 1997

## 10. Course Organization

Course name		Ocular Pharmacology
Course code		OPC106A
Course Leader/s Name		
Course Leader Contact Details	Phone:	080 – 49065555
	E- mail:	
Course Specifications Approval		June 2022
Next Course Specifications Review		June 2026

## Course Specifications: Ocular Diseases I

Course Title	Ocular Diseases I
Course Code	OPC203A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

This course deals with various ocular diseases affecting various parts of the eyes. It covers clinical signs and symptoms, cause, pathophysiological mechanism, diagnostic approach, differential diagnosis and management aspects of the ocular diseases.

#### 2. Course Size and Credits:

Number of credits	2
Total hours of class room interaction during the semester	30
Number of practical hours	00
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50 The distribution of marks for theory and laboratory/clinical component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

#### 3. Course Outcomes (CO)

Approved by the Academic Council at its 32th meeting held on 22<sup>nd</sup> June 2024

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Upon completion of this course students will be able to:

No.	Course outcome
1.	Describe the applied anatomy of the orbit in context of developmental and acquired anomalies
2.	Describe the applied anatomy of the lid with specific reference to developmental and acquired Anomalies
3.	Explain the lacrimal system and the diseases affecting it
4.	Discuss the corneal applied anatomy and pathological conditions affecting conjunctiva
5.	Describe the inflammatory, degenerative, diseases affecting cornea

#### 4. Course Contents:

##### Orbit

- Applied Anatomy, Proptosis (Classification, Causes, Investigations), Enophthalmos, Developmental Anomalies (craniosynostosis, Craniofacial Dysostosis, Hypertelorism, Median facial cleft syndrome), Orbital Inflammations (Preseptal cellulites, Orbital cellulitis, Orbital Periostitis, cavernous sinus Thrombosis), Grave's Ophthalmopathy, Orbital tumors (Dermoids, capillary haemangioma, Optic nerve glioma), Orbital blowout fractures, Orbital surgery (Orbitotomy), Orbital tumors, Orbital trauma, Approach to a patient with proptosis

##### Lids

- Applied Anatomy, Congenital anomalies (Ptosis, Coloboma, Epicanthus, Distichiasis, Cryptophthalmos), Oedema of the eyelids (Inflammatory, Solid, Passive edema), Inflammatory disorders (Blepharitis, External Hordeolum, Chalazion, Internal hordeolum, Molluscum Contagiosum), Anomalies in the position of the lashes and Lid Margin (Trichiasis, Ectropion, Entropion, Symblepharon, Blepharophimosis, Lagophthalmos, Blepharospasm, Ptosis), Tumors (Papillomas, Xanthelasma, Haemangioma, Basal carcinoma, Squamous cell carcinoma, sebaceous gland melanoma)

##### Lacrimal System

- Applied Anatomy, Tear Film, The Dry Eye (Sjogren's Syndrome), The watering eye (Etiology, clinical evaluation), Dacryocystitis, Swelling of the Lacrimal gland (Dacryoadenitis)

##### Conjunctiva

- Applied Anatomy, Inflammations of conjunctiva (Infective conjunctivitis – bacterial, chlamydial, viral, Allergic conjunctivitis, Granulomatous conjunctivitis), Degenerative conditions (Pinguecula, Pterygium, Concretions), Symptomatic conditions (Hyperaemia, Chemosis, Ecchymosis, Xerosis, Discoloration), Cysts and Tumors

##### Cornea

- Applied Anatomy and Physiology, Congenital Anomalies (Megalocornea, Microcornea, Cornea plana, Congenital cloudy cornea), Inflammations of the cornea (Topographical classifications: Ulcerative keratitis and Non ulcerative, Etiological classifications: Infective, Allergic, Trophic, Traumatic, Idiopathic), Degenerations (classifications, Arcussenilis, Vogt's white limbal girdle, Hassal-henle bodies, Lipoid Keratopathy, Band shaped keratopathy, Salzmann's nodular degeneration, Droplet keratopathy, Pellucid Marginal degeneration), Dystrophies (Reis Buckler dystrophy, Recurrent corneal erosion syndrome, Granular

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 Faculty of Applied Sciences



dystrophy, Lattice dystrophy, Macular dystrophy, cornea guttata, Fuch's epithelial endothelial dystrophy, Congenital hereditary endothelial dystrophy), Keratoconus, Keratoglobus, Corneal oedema, Corneal opacity, Corneal vascularization, Penetrating Keratoplasty

#### Uveal Tract and Sclera

- Applied Anatomy, Classification of uveitis, Etiology, Pathology, Anterior Uveitis, Posterior Uveitis Purulent Uveitis, Endophthalmitis, Panophthalmitis, Pars Planitis, Tumors of uveal tract(Melanoma), Episcleritis and scleritis, Clinical examination of Uveitis and Scleritis

#### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	3	2	1		1			1	3	2		1
CO-2	3	2	1		1			1	3	1		1
CO-3	3	2	1		1			1	3	2		1
CO-4	3	2	1		1			1	3	1		1
CO-5	3	2	1		1			1	3	2		1

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

#### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		15
Demonstrations		05
1.Demonstration using Videos	05	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
Numeracy		00
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	-	

<b>Others</b>		<b>10</b>
1. Case Study Presentation	05	
2. Guest Lecture	02	
3. Industry/Field Visit	-	
4. Brain Storming Sessions	-	
5. Group Discussions	03	
6. Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>05</b>
<b>Total Duration in Hours</b>		<b>35</b>

#### 7. Method of Assessment

<b>CE (60% weightage)</b>			<b>SEE (40% weightage)</b>
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour theory paper of 50 marks with a weightage

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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.

### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

### 9. Course Resources

#### 1. Essential Reading


- A.K Khurana: Comprehensive Ophthalmology, 4th edition, New age international (p) Ltd. Publishers, New Delhi, 2007

#### Recommended reading:

- Stephen J. Miller : Parsons Diseases of the Eye, 18th edition, Churchill Livingstone, 1990
- Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 6th edition, Butterworth - Heinemann, 2007

## 10. Course Organization

<b>Course name</b>		Ocular Diseases I
<b>Course code</b>		OPC203A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

  
 Dr. Huda  
 Department of Allied Health Sciences  
 Iqbal Ramallah University of Applied Sciences  
 P.O. Box 1010, 19110

## Course Specifications: Clinical Optometry I

Course Title	Clinical Optometry I
Course Code	OPC205A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

Upon completion of the course, the student should be able to demonstrate the practical skills in performing basic clinical tests/examinations of anterior eye segment.

#### 2. Course Size and Credits:


Number of credits	5
Total hours of class room interaction during the semester	00
Number of practical hours	90
Number of Tutorial hours	30
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	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	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

#### Teaching, Learning and Assessment

### 3. Course Outcomes (CO)

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Upon completion of this course students will be able to:

No.	Course outcome
1.	Identify common eye diseases
2.	Illustrate on the optical principle and instrumentation of anterior segment
3.	Perform basic tests/examinations for anterior eye segment
4.	Interpret the test findings

#### 4. Course Contents:

- History Taking
- Visual acuity Assessment
- Trial set and accessories
- Objective Retinoscopy
- Lensometry
- Keratometry
- Corneal topography
- Slit lamp
- Color vision tests
- Pupillary examination
- Identification of clinical signs-Anterior segment diseases

#### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PSO -1	PSO -2	PSO -3	PSO -4
CO-1	2					1		2	3	1		
CO-2	3	3				2		2	2	1		1
CO-3	2	3							3	2		
CO-4	3	3						1	2			

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

#### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		0

<b>Demonstrations</b>		<b>20</b>
1.Demonstration using Videos	05	
2.Demonstration using Physical Models/ Systems	15	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		<b>00</b>
1.Solving Numerical Problems	-	
<b>Practical Work</b>		<b>80</b>
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	30	
5.Hospital	50	
6.Model Studio	-	
<b>Others</b>		<b>40</b>
1.Case Study Presentation	20	
2.Guest Lecture	-	
3. Industry/Field Visit	10	
4.Brain Storming Sessions	-	
5.Group Discussions	10	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>10</b>
<b>Total Duration in Hours</b>		<b>150</b>

## 7. Method of Assessment

<b>CE Laboratory Component (60%)</b>	<b>SEE (40%)</b>
(Formative laboratory performance assessment) (Log book/case presentations/hospital postings)	SEE (OSPE/OSCE)
60 Marks (20+20+20)	40 marks

In CE there shall be one subcomponents of CE namely Laboratory performance assessment. It is evaluated individually accounting to 60 marks as indicated in Course Specifications along with Logbook Report

After the laboratory subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. In summary, the ratio of Formative (Continuous Evaluation-CE) vs Summative (Semester End Examination-SEE) should be 60:40.



## 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

## 9. Course Resources


### 1. Essential Reading


- A K Khurana: Comprehensive Ophthalmology, 4th edition, New age international (p) Ltd. Publishers, New Delhi, 2007
- David Henson: Optometric Instrumentations, Butterworth- Heinemann, UK, 1991

### Recommended reading:

- Stephen J. Miller : Parsons Diseases of the Eye, 18th edition, Churchill Livingstone, 1990
- Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 6th edition, Butterworth - Heinemann, 2007
- P R Yoder: Mounting Optics in Optical Instruments, SPIE Society of Photo- Optical Instrumentation, 2002
- G Smith, D A. Atchison: The Eye and Visual Optical Instruments, Cambridge University Press, 1997

<b>Course name</b>		Clinical Optometry I
<b>Course code</b>		OPC205A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

  
**Head**  
 Department of Allied Health Sciences  
 M.S. Ramiah University of Applied Sciences  
 Bangalore 560 054

  
 Dean - Academics  
 M.S. Ramiah University of Applied Sciences  
 Bangalore - 560 054

## Course Specifications: Visual Optics I

Course Title	Visual Optics I
Course Code	OPC201A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

This course deals with the concept of eye as an optical instrument and thereby covers various optical components of eye, types of refractive errors, clinical approach in diagnosis and management of various types of refractive errors. Upon completion of the course, the student should be able to understand the fundamentals of optical components of the eye and gain theoretical knowledge and practical skill on visual acuity measurement, objective and subjective /clinical refraction.

#### 2. Course Size and Credits:

Number of credits	2
Total hours of class room interaction during the semester	15
Number of Tutorial hours	15
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 continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

#### 1.Course Outcomes

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Understand the fundamentals of optical components of the eye
2.	<b>CO2:</b> Describe Principle of Retinoscopy
3.	<b>CO3:</b> Demonstrate the theoretical knowledge of the optical components of the eye
4.	<b>CO4:</b> Describe the role of aberration in the eye

#### 4. Course Contents:

- Review of Geometrical Optics: Vergence and power, Conjugacy, object space and image space, Sign convention, Spherical refracting surface, Spherical mirror; catoptric power, Cardinal points, Magnification, Light and visual function, Clinical Relevance of: Fluorescence, Interference, Diffraction, Polarization, Bi-refringence, Dichroism, Aberration and application Spherical and Chromatic
- Optics of Ocular Structure, Cornea and aqueous, Crystalline lens, Vitreous,
- Measurements of Optical Constants of the Eye, Corneal curvature and thickness, Keratometry, Curvature of the lens and ophthalmophakometry, Axial and axis of the eye, Basic Aspects of Vision, Visual Acuity, Light and Dark Adaptation, Science of Measuring visual performance and application to Clinical Optometry
- Refractive anomalies and their causes, Etiology of refractive anomalies, Contributing variability and their ranges, Populating distributions of anomalies, Optical component measurements, Growth of the eye in relation to refractive errors
- Objective Refraction (Static) – Streak retinoscopy, Principle and Procedure, Difficulties and interpretation of findings, Transposition and Spherical equivalent

#### 6. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3	2			1				3	2		1
CO-2	3							1	3	2		1
CO-3	3	2							3	1		1
CO-4	3				1				2	1		
CO-5	3							1	2			

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

## 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>15</b>
<b>Demonstrations</b>		
1.Demonstration using Videos	05	<b>05</b>
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		
1.Solving Numerical Problems	-	<b>00</b>
<b>Practical Work</b>		
1.Course Laboratory	-	<b>00</b>
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		
1.Case Study Presentation	05	<b>10</b>
2.Guest Lecture	02	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	03	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>05</b>
<b>Total Duration in Hours</b>		<b>35</b>

## 7. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

#### Recommended reading:

- A H Tunnacliffe: Visual optics, The Association of British Optician, 1987
- AG Bennett & RB Rabbets: Clinical Visual optics, 3rd edition, Butterworth Heinemann, 1998 Recommended reading:
- M P Keating: Geometric, Physical and Visual optics, 2nd edition, Butterworth-Heinemann, USA, 2002 □HL Rubin: Optics for clinicians, 2nd edition, Triad publishing company. Florida, 1974.
- H Obstfeld: Optic in Vision- Foundations of visual optics & associated computations, 2nd edition, Butterworth, UK, 1982.
- WJ Benjamin: Borish's clinical refraction, 2nd edition, Butterworth Heinemann, Missouri, USA, 2006
- T Grosvenor: Primary Care Optometry, 4th edition, Butterworth – heineman, USA, 2002
- PREREQUISITES: Geometrical optics, Physical optics, Ocular Physiology

<b>Course name</b>		Visual Optics I
<b>Course code</b>		OPC201A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026



## Course Specifications: Optometric Optics I

Course Title	Optometric Optics I
Course Code	OPC202A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1 Course Summary

#### 1. Aim and Summary

This course deals with understanding the theory behind spectacle lenses and frames, their materials, types, advantages and disadvantages, calculations involved, when and how to prescribe. It will impart construction, design application and development of lenses, particularly of the methods of calculating their power and effect.

#### 2. Course Size and Credits:

Number of credits	2
Total hours of class room interaction during the semester	15
Number of Tutorial hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences.
Course marks	Total Marks: 50 The distribution of marks for theory component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

#### Teaching, Learning and Assessment

#### 1.Course Outcomes

Upon completion of this course students will be able to:

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No.	Course outcome
1.	<b>CO1:</b> Demonstrate the understanding of spectacle lenses and ophthalmic prisms
2.	<b>CO2:</b> Classify lens materials and characteristics
3.	<b>CO3:</b> Perform lens power measurement, centration and transposition
4.	<b>CO4:</b> Analyze various designs and forms of lenses
5.	<b>CO5:</b> Apply lens design concepts for different occupations

#### 4 Course Contents:

- Introduction –Light, Mirror, Reflection, Refraction and Absorption
- Prisms –Definition, properties, Refraction through prisms, Thickness difference, Base-apex notation, uses, nomenclature and units, Sign Conventions, Fresnel's prisms, rotary prisms
- Lenses –Definition, units, terminology used to describe, form of lenses
- Vertex distance and vertex power, Effectivity calculations
- Lens shape, size and types i.e. Spherical, cylindrical and Sphero-cylindrical
- Transpositions –Simple, Toric and Spherical equivalent
- Prismatic effect, centration, decentration and Prentice rule, Prismatic effect of Plano-cylinder and Sphero cylinder lenses
- Spherometer & Sag formula, Edge thickness calculations
- Magnification in high plus lenses, Minification in high minus lenses
- Tilt induced power in spectacles
- Aberration in Ophthalmic Lenses

#### 8. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3								3			
CO-2	3								3			
CO-3	3				1		2		3	2		1
CO-4	3							2	3	2		
CO-5	3		2		1		1	3	3	3	1	1
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												

#### 6. Course Teaching and Learning Methods

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Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		15
Demonstrations		05
1.Demonstration using Videos	02	
2.Demonstration using Physical Models/ Systems	03	
3.Demonstration on a Computer	-	
Numeracy		05
1.Solving Numerical Problems	05	
Practical Work		00
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
Others		05
1.Case Study Presentation	03	
2.Guest Lecture	02	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	-	
6.Discussing Possible Innovations	-	
Written Examination (Mid-Term tests and SEE)		05
Total Duration in Hours		35

#### 9. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

#### Recommended reading:

- Course notes
- Jalie M: The principles of Ophthalmic Lenses, The Association of Dispensing Opticians, London, 1994. □
- David Wilson: Practical Optical Dispensing, OTEN- DE, NSW TAFE Commission, 1999 □
- C V Brooks, IM Borish: System for Ophthalmic Dispensing, Second edition, Butterworth- Heinemann, USA, 1996 □

<b>Course name</b>		Optometric Optics I
<b>Course code</b>		OPC202A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

*[Signature]*  
**Head**  
 Department of Allied Health Sciences  
 M.S. Ramaiah University of Applied Sciences  
 Bangalore 560054

*[Signature]*  
**Dean - Academics**  
 M.S. Ramaiah University of Applied Sciences  
 Bangalore 560054

## Course Specifications: Optometric Instruments I

Course Title	Optometric Instruments I
Course Code	OPC204A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

This course covers commonly used optometric instruments, its basic principle, description and usage in clinical practice. Upon completion of the course, the student should be able to gain theoretical knowledge and basic practical skill in handling the optometry instruments

#### 2. Course Size and Credits:

Number of credits	2
Total hours of class room interaction during the semester	15
Number of Tutorial hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences.
Course marks	Total Marks: 50 The distribution of marks for theory component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

#### 1.Course Outcomes

Upon completion of this course students will be able to:

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No.	Course outcome
1.	<b>CO1:</b> Able to demonstrate knowledge on the optical principle and instrumentation used in eye care
2.	<b>CO2:</b> Describe the construction, design and applications of these devices
3.	<b>CO3:</b> Compare and contrast the use of instruments for screening and diagnostic purposes
4.	<b>CO4:</b> Able to analyze and appraise the instruments which will help in clinical decision making
5.	<b>CO5:</b> Able to interpret the results and identify common eye diseases

#### 4. Course Contents:

- Visual acuity charts
- Trial case lenses
- Refractor (phoropter)
- Retinoscope
- Objective optometers
- Aberrometer
- Lensometer, Lens gauges
- Slit-lamp
- Tonometer
- Keratometer and corneal topography
- Color Vision Testing Devices

#### 10. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3	2	1		1				3			1
CO-2	3	2			2			1	3	2		
CO-3	3	2			2			2	3	2		1
CO-4	3	2	1		1				3			
CO-5	3	2	1		1				3			1

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

#### 6. Course Teaching and Learning Methods

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Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>15</b>
<b>Demonstrations</b>		<b>07</b>
1.Demonstration using Videos	05	
2.Demonstration using Physical Models/ Systems	02	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		<b>00</b>
1.Solving Numerical Problems	-	
<b>Practical Work</b>		<b>00</b>
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		<b>05</b>
1.Case Study Presentation	-	
2.Guest Lecture	05	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	-	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>04</b>
<b>Total Duration in Hours</b>		<b>31</b>

#### 1.5 Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60%

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Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions


## 9. Course Resources

### 1. Essential Reading

#### Recommended reading:

- Course notes
- David Henson: Optometric Instrumentations, Butterworth- Heinnemann, UK, 1991
- P R Yoder: Mounting Optics in Optical Instruments, SPIE Society of Photo- Optical Instrumentation, 2002
- G Smith, D A. Atchison: The Eye and Visual Optical Instruments, Cambridge University Press, 1997

<b>Course name</b>		Optometric Instruments I
<b>Course code</b>		OPC204A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

  
 Head  
 Department of Allied Health Sciences  
 M S Ramalath  
 Bangalore 560054

### Course Specifications: Optometric Optics II

Course Title	Optometric Optics II
Course Code	OPC207A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

#### 1. Course Summary

##### 1. Aim and Summary

This course deals with understanding the theory behind spectacle lenses and frames, their materials, types, advantages and disadvantages, calculations involved, when and how to prescribe. It will impart construction, design application and development of lenses, particularly of the methods of calculating their power and effect. In addition deals with role of optometrists in optical set-up.

##### 2. Course Size and Credits:

Number of credits	2
Total hours of class room interaction during the semester	30
Number of Tutorial hours	00
Number of semester weeks	16
Department responsible	Allied Health Sciences.
Course marks	Total Marks: 50 The distribution of marks for theory component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

#### Teaching, Learning and Assessment

##### 1.Course Outcomes

Upon completion of this course students will be able to:

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No.	Course outcome
1.	<b>CO1:</b> Identify and describe various lens materials and its characteristics
2.	<b>CO2:</b> Identify various lens designs and types of ophthalmic lenses
3.	<b>CO3:</b> Compute surface powers and decide appropriate tool for lens surfacing
4.	<b>CO4:</b> Describe and identify various types of Spectacle frames
5.	<b>CO5:</b> Able to dispense and fit spectacle lenses

#### 4. Course Contents:

- **Spectacle Lenses - II:** Manufacture of glass, Lens materials, Lens surfacing, Principle of surface generation and glass cements, Terminology used in Lens workshop, Lens properties, Lens quality, Faults in lens material, Faults on lens surface
- **Spectacle Frames:** Types and parts, Classification of spectacle frames-material, weight, temple position, Coloration, Frame construction, Frame selection, Size, shape, mounting and field of view of ophthalmic lenses
- **Tinted & Protective Lenses:** Characteristics of tinted lenses Absorptive Glasses, Polarizing Filters, Photochromic & Reflecting filters, Safety Lenses-Toughened lenses, Laminated Lenses, CR 39, Polycarbonate lenses
- **Multifocal Lenses:** Introduction, history and development, types, Bifocal lenses, Trifocal & Progressive addition lenses
- **Reflection from spectacle lens surface & lens coatings:** Reflection from spectacle lenses - ghost images -Reflections in bifocals at the dividing line, Antireflection coating, Mirror coating, Hard Multi Coating \*HMC+, Hydrophobic coating
- **Miscellaneous Spectacle lenses:** Iseikonic lenses, Spectacle magnifiers, Recumbent prisms, Fresnel prism and lenses, Lenticular &Aspherical lenses, High Refractive index glasses
- **Miscellaneous :**Components of spectacle prescription & interpretation, transposition, Add and near power relation, Frame selection –based on spectacle prescription, professional requirements, age group, face shape, Measuring Inter-pupillary distance (IPD) for distance & near, bifocal height, Lens & Frame markings, Pupillary centers, bifocal heights, Progressive markings & adjustments –facial wrap, pantoscopic tilt, Recording and ordering of lenses (power, add, diameter, base, material, type, lens enhancements), Neutralization –Hand & lensometer, axis marking, prism marking, Faults in spectacles (lens fitting, frame fitting, patients complaints, description, detection and correction), Final checking & dispensing of spectacles to customers, counselling on wearing & maintaining of spectacles, Accessories –Bands, chains, boxes, slevets, cleaners, screwdriver kit, Spectacle repairs –tools, methods, soldering, riveting, frame adjustments

#### 12. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3	2			2			1	3	2		1
CO-2	3	2	1		1			1	3	2		1
CO-3	2	2			1				2		1	1
CO-4	3	2			1			1	3	2	1	1
CO-5	3	2						1	3	2		1
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												

#### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>15</b>
<b>Demonstrations</b>		<b>07</b>
1.Demonstration using Videos	05	
2.Demonstration using Physical Models/ Systems	02	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		<b>02</b>
1.Solving Numerical Problems	02	
<b>Practical Work</b>		<b>00</b>
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		<b>02</b>
1.Case Study Presentation	-	
2.Guest Lecture	02	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	-	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>04</b>
<b>Total Duration in Hours</b>		<b>32</b>



### 13. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- a) Online Test
- b) Assignments/Problem Solving
- c) Field Assignment
- d) Open Book Test
- e) Portfolio
- f) Reports
- g) Case Study
- h) Group Task
- i) Laboratory / Clinical Work Record
- j) Computer Simulations
- k) Creative Submission
- l) Virtual Labs
- m) Viva / Oral Exam
- n) Lab Manual Report
- o) Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

#### Recommended reading:

- Course notes
- Jalie MO: Ophthalmic lens and Dispensing, 3rd edition, Butterworth –Heinemann, 2008
- Troy E. Fannin, Theodore Grosvenor: Clinical Optics, 2nd edition, Butterworth – Heinemann, 1996
- C W Brooks, IM Borish: System for Ophthalmic Dispensing, 3rd edition, Butterworth - Heinemann, 2007
- Michael P Keating: Geometric, Physical & Visual Optics, 2nd edition, Butterworth – Heinemann, 2002

<b>Course name</b>		Optometric Optics II
<b>Course code</b>		OPC207A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

## Course Specifications: Visual Optics II

Course Title	Visual Optics II
Course Code	OPC206A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

This course deals with diagnosis and management of various types of refractive errors

#### 2. Course Size and Credits

Number of credits	2
Total hours of class room interaction during the semester	15
Number of Tutorial hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences.
Course marks	Total Marks: 50 The distribution of marks for theory component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

#### 1.Course Outcomes

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Assess range and amplitude of accommodation
2.	<b>CO2:</b> Describe and perform cycloplegic refraction
3.	<b>CO3:</b> Explain and perform static & dynamic retinoscopy
4.	<b>CO4:</b> Explain the basis of Radical retinoscopy and near retinoscopy and perform the procedure
5.	<b>CO5:</b> Perform binocular balancing
6.	<b>CO6:</b> Describe How to calculate Effective Power & Magnification

#### 4. Course Contents:

- **Accommodation formulae and calculations**
- **Convergence:** Type, Measurement and Anomalies, Relationship between accommodation and convergence-AC/A ratio
- **Objective Refraction (Dynamic):** Dynamic retinoscopy various methods, Radical retinoscopy and near retinoscopy, Cycloplegic refraction
- **Subjective Refraction:** Principle and fogging, Fixed astigmatic dial (Clock dial), Combination of fixed and rotator dial (Fan and block test), J.C.C, Duochrome test, Binocular balancing- alternate occlusion, prism dissociation, dissociate Duochrome balance, Borish dissociated fogging, Binocular refraction-Variou techniques
- **Effective Power & Magnification:** Ocular refraction vs. Spectacle refraction, Spectacle magnification vs. Relative spectacle magnification, Axial vs. Refractive ametropia, Knapp's law, Ocular accommodation vs. Spectacle accommodation

#### 14. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3	2	1		1			2	3	2		2
CO-2	3	2	1					2	3	3		2
CO-3	3	2	1					2	3	3		2
CO-4	3	2						2	3	3		2
CO-5	3	3			1			2	3	3		2
CO-6	3	2	1		1				3	2		

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

## 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>15</b>
<b>Demonstrations</b>		
1.Demonstration using Videos	05	<b>05</b>
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		
1.Solving Numerical Problems	-	<b>00</b>
<b>Practical Work</b>		
1.Course Laboratory	-	<b>00</b>
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		
1.Case Study Presentation	05	<b>07</b>
2.Guest Lecture	02	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	-	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>04</b>
<b>Total Duration in Hours</b>		<b>32</b>

## 15. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- p) Online Test
- q) Assignments/Problem Solving
- r) Field Assignment
- s) Open Book Test
- t) Portfolio
- u) Reports
- v) Case Study
- w) Group Task
- x) Laboratory / Clinical Work Record
- y) Computer Simulations
- z) Creative Submission
- aa) Virtual Labs
- bb) Viva / Oral Exam
- cc) Lab Manual Report
- dd) Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.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

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11.	Presentation Skills	Seminars, Case discussions
12.	Behavioral Skills	Group discussion, Case discussions
13.	Information Management	Case discussions
14.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

#### Recommended reading:

- Course notes
- Theodore Grosvenor: Primary Care Optometry, 5th edition, Butterworth – Heinemann, 2007 □ Duke – Elder's practice of Refraction
- AI Lens: Optics, Retinoscopy, and Refractometry: 2nd edition, SLACK Incorporated (p) Ltd, 2006
- George K. Hans, Kenneth Cuiffreda: Models of the visual system, Kluwer Academic, NY, 2002
- Leonard Werner, Leonard J. Press: Clinical Pearls in Refractive Care, Butterworth – Heinemann, 2002
- David B. Elliot: Clinical Procedures in Primary Eye care, 3rd edition, Butterworth – Heinemann, 2007
- WJ Benjamin: Borish's clinical refraction, 2nd edition, Butterworth Heinemann, Missouri, USA, 2006

<b>Course name</b>		Visual Optics II
<b>Course code</b>		OPC206A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026



## Course Specifications: Ocular Diseases II

Course Title	Ocular Diseases II
Course Code	OPC208A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

This course deals with various ocular diseases affecting various parts of the eyes. It covers clinical signs and symptoms, cause, pathophysiological mechanism, diagnostic approach, differential diagnosis and management aspects of the ocular diseases. At the end of the course the students will be knowledgeable in the following aspects of ocular diseases: knowledge on Etiology, Epidemiology, Symptoms, Signs, Course sequelae of ocular disease, Diagnostic approach, and Management of the ocular diseases.

#### 2. Course Size and Credits:

Number of credits	2
Total hours of class room interaction during the semester	15
Number of Tutorial hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences.
Course marks	Total Marks: 50 The distribution of marks for theory component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

#### Teaching, Learning and Assessment

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## 1.Course Outcomes

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Describe the applied anatomy of Congenital and Developmental Disorders of the eye parts
2.	<b>CO2:</b> Describe the inflammatory and infectious conditions affecting posterior segment
3.	<b>CO3:</b> Describe the ocular injuries and their management
4.	<b>CO4:</b> Describe types of cataracts, investigations and management of them
5.	<b>CO5:</b> Explain the clinical aspects of Neuro –ophthalmic conditions
6.	<b>CO6:</b> Explain the symptoms, investigations and management of Glaucoma

## 4. Course Contents:

- **Retina and Vitreous:** Applied Anatomy, Congenital and Developmental Disorders ( Optic Disc: Coloboma, Drusen, Hypoplasia, Medullated nerve fibers; Persistent Hyaloid Artery) Inflammatory disorders ( Retinitis : Acute purulent , Bacterial, Virus, mycotic), Retinal Vasculitis ( Eales's), Retinal Artery Occlusion ( Central retinal Artery occlusion), Retinal Vein occlusion ( Ischaemic, Non Ischaemic , Branch retinal vein occlusion), Retinal degenerations : Retinitis Pigmentosa, Lattice degenerations, Macular disorders: Solar retinopathy, central serous retinopathy, cystoid macular edema, Age related macular degeneration, Retinal Detachment: (Rhegmatogenous, Tractional, Exudative), Retinoblastoma, Diabetic retinopathy
- **Ocular Injuries:** Closed globe injury (contusion, lamellar laceration), Open globe injury ( rupture, laceration, penetrating injury, perforating injury), Mechanical injuries ( Extraocular foreign body, blunt trauma, perforating injury, sympathetic ophthalmitis), Non Mechanical Injuries ( Chemical injuries, Thermal, Electrical, Radiational), Clinical approach towards ocular injury patients
- **Lens:** Applied Anatomy and Physiology, Clinical examination, Classification of cataract , Congenital and Developmental cataract, Acquired ( Senile, Traumatic, Complicated, Metabolic, Electric, Radiational, Toxic), Morphological: Capsular, Subcapsular, Cortical, Supranuclear, Nuclear, Polar, Management of cataract ( Non-surgical and surgical measures; preoperative evaluation, Types of surgeries, Complications of cataract surgery , Displacement of lens: Subluxation, Displacement, Lens coloboma, Lenticonus, Microsperophakia.
- **Clinical Neuro-ophthalmology:** Pupillary reflexes and abnormalities (Amaurotic light reflex, Efferent pathway defect, Wernicke's hemianopic pupil, Marcus gunn pupil. Argyll Robetson pupil, Adie's tonic pupil), Optic neuritis, Anterior Ischemic optic neuropathy, Pappilloedema, optic atrophy, Cortical blindness, Malingering, Nystagmus, Clinical examination
- **Glaucoma:** Applied anatomy and physiology of anterior segment, Clinical Examination, Definitions and classification of glaucoma, Pathogenesis of glaucomatous ocular damage , Congenital glaucoma's, Primary open angle glaucoma, Ocular hypertension, Normal Tension

Glaucoma, Primary angle closure glaucoma ( Primary angle closure suspect, Intermittent glaucoma, acute congestive, chronic angle closure), Secondary Glaucoma's, Management : common medications, laser intervention and surgical techniques

#### 16. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3	2	1		1				3	2		1
CO-2	3	2	1		1				3	2		1
CO-3	3	3	2		1				3	3		1
CO-4	3	2	1		1				3	2		1
CO-5	3	3	2		1				3	3		1
CO-6	3	2	1		1				3	2		1
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												

#### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		15
Demonstrations		02
1.Demonstration using Videos	02	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
Numeracy		00
1 Solving Numerical Problems	-	
Practical Work		00
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	

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5.Hospital	-	09
6.Model Studio	-	
Others		
1.Case Study Presentation	05	
2.Guest Lecture	02	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	04
5.Group Discussions	02	
6.Discussing Possible Innovations	-	
Written Examination (Mid-Term tests and SEE)		
Total Duration in Hours		30

#### 17. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

#### 9. Course Resources

##### 1. Essential Reading

Recommended reading:

- Course notes
- A K Khurana: Comprehensive Ophthalmology, 4th edition, New age international (p) Ltd. Publishers, New Delhi, 2007
- Stephen J. Miller : Parsons Diseases of the Eye, 18th edition, Churchill Livingstone, 1990
- Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 6th edition, Butterworth- Heinemann, 2007

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<b>Course name</b>		Ocular Diseases II
<b>Course code</b>		OPC208A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

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Head  
Department of Allied Health Sciences  
M S Ramaiah University of Applied Sciences

## Course Specifications: Optometric Instruments II

Course Title	Optometric Instruments II
Course Code	OPC210A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

This course covers commonly used optometric instruments, its basic principle, description and usage in clinical practice. Upon completion of the course, the student should be able to gain theoretical knowledge and basic practical skill in handling the optometry instruments

#### 2. Course Size and Credits:


Number of credits	2
Total hours of class room interaction during the semester	15
Number of Tutorial hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences.
Course marks	Total Marks: 50 The distribution of marks for theory component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

#### 1. Course Outcomes

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Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Demonstrate knowledge on the optical principle and instrumentation used in eye care
2.	<b>CO2:</b> Describe the construction, design and applications of these devices
3.	<b>CO3:</b> Compare and contrast the use of instruments for screening and diagnostic purposes
4.	<b>CO4:</b> Analyze and appraise the instruments which will help in clinical decision making
5.	<b>CO5:</b> Interpret the results and identify common eye diseases

#### 4. Course Contents:

- Ophthalmoscopes
- Direct ophthalmoscope
- Indirect ophthalmoscope
- Fundus bio microscopy
- Indirect ophthalmoscope
- Perimetry
- Ocular Coherence Tomography
- Fundus Fluorescein Angiography
- Electrophysiology

#### 18. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3	2	1		1				3			1
CO-2	3	2			2			1	3	2		
CO-3	3	2			2			2	3	2		1
CO-4	3	2	1		1				3			
CO-5	3	2	1		1				3			1
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												



## 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>15</b>
<b>Demonstrations</b>		
1.Demonstration using Videos	02	<b>02</b>
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		<b>00</b>
1.Solving Numerical Problems	-	
<b>Practical Work</b>		
1.Course Laboratory	-	<b>00</b>
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		
1.Case Study Presentation	02	<b>09</b>
2.Guest Lecture	05	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	02	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>04</b>
<b>Total Duration in Hours</b>		<b>30</b>

## 19. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

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

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

#### Recommended reading:

- course notes
- David Henson: Optometric Instrumentations, Butterworth- Heinemann, UK, 1991
- P R Yoder: Mounting Optics in Optical Instruments, SPIE Society of Photo- Optical Instrumentation, 2002
- G Smith, D A. Atchison: The Eye and Visual Optical Instruments, Cambridge University Press, 1997

<b>Course name</b>		Optometric Instruments II
<b>Course code</b>		OPC210A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

*[Signature]*  
**Head**  
 Department of Allied Health Sciences  
 M S Ramaiah University of Applied Sciences  
 Bangalore 560054

Approved by the Academic Council at its 32th meeting held on 22<sup>nd</sup> June 2024

*[Signature]* Page 143 | 242  
**Dean - Academics**  
 M.S. Ramaiah University of Applied Sciences  
 Bangalore - 560054

## Course Specifications: Clinical Optometry II

Course Title	Clinical Optometry II
Course Code	OPC209A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

At the end of the course the students will be skilled in knowing the purpose, set-up and devices required for the test, indications and contraindications of the test, step-by-step procedures, documentation of the findings, and interpretation of the findings of the various clinical optometry procedures specific to posterior eye segment.

#### 2. Course Size and Credits:

Number of credits	06
Number of Practical Hours	120
Number of Tutorial hours	45
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	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

#### 1.Course Outcomes

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Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Able to demonstrate knowledge on the optical principle and instrumentation of posterior segment
2.	<b>CO2:</b> Understand purpose, indications and contraindications of clinical procedures
3.	<b>CO3:</b> Able to perform basic tests/examinations for posterior eye segment
4.	<b>CO4:</b> Describe the need for clinical examination and choose the appropriate instrument
5.	<b>CO5:</b> Perform test, document and interpret the findings of various clinical procedures

#### 4. Course Contents:

- Objective & Subjective refraction
- Slit lamp Biomicroscopy
- Tonometry (Goldmann Applanation Tonometer)
- Lacrimal apparatus test
- Amsler Test
- Contrast Sensitivity Function test
- Ophthalmoscopy (Direct & Indirect)
- Identification of clinical signs -Posterior segment diseases
- Photostress test
- Ocular Coherence Tomography

#### 20. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PSO-1	PSO-2	PSO-3	PSO-4
<b>CO-1</b>	2					1		2	3	1		
<b>CO-2</b>	3	1				2		3	2	1		1
<b>CO-3</b>	2	3							3	3		
<b>CO-4</b>	3	3						1	3			
<b>CO-5</b>	2	3							2			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												

## 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>00</b>
<b>Demonstrations</b>		
1.Demonstration using Videos	05	<b>05</b>
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		
1.Solving Numerical Problems	-	<b>00</b>
<b>Practical Work</b>		
1.Course Laboratory	-	<b>120</b>
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	50	
5.Hospital	70	
6.Model Studio	-	
<b>Others</b>		
1.Case Study Presentation	20	<b>35</b>
2.Guest Lecture	05	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	15	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>05</b>
<b>Total Duration in Hours</b>		<b>165</b>

## 7. Method of Assessment

CE Laboratory Component (60%)	SEE (40%)
(Formative laboratory performance assessment) (Log book/case presentations/hospital postings)	SEE (OSPE/OSCE)
60 Marks (20+20+20)	40 marks

In CE there shall be one subcomponents of CE namely Laboratory performance assessment. It is evaluated individually accounting to 60 marks as indicated in Course Specifications along with Logbook Report

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After the laboratory subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. In summary, the ratio of Formative (Continuous Evaluation-CE) vs Summative (Semester End Examination-SEE) should be 60:40.

### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

### 9. Course Resources

#### 1. Essential Reading

- A K Khurana: Comprehensive Ophthalmology, 4th edition, New age international (p) Ltd. Publishers, New Delhi, 2007
- David Henson: Optometric Instrumentations, Butterworth- Heinemann, UK, 1991

#### Recommended reading:

- Stephen J. Miller : Parsons Diseases of the Eye, 18th edition, Churchill Livingstone, 1990
- Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 6th edition, Butterworth - Heinemann, 2007

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- P R Yoder: Mounting Optics in Optical Instruments, SPIE Society of Photo- Optical Instrumentation, 2002
- G Smith, D A. Atchison: The Eye and Visual Optical Instruments, Cambridge University Press, 1997

<b>Course name</b>		Clinical Optometry II
<b>Course code</b>		OPC209A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 -- 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026


22

### Course Specifications: Constitution of India

Course Title	Constitution of India
Course Code	AHN203A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

#### 1. Course Summary

##### 1. Aim and Summary

This course aims at enabling students understand the key principles of Indian Constitution, Medical law and Ethics. The course facilitates the understanding of the framework of Indian constitution. Health professionals are bound by, not just moral obligations, but also by laws and official regulations that form the legal framework to regulate medical practice. Hence, it is now a universal consensus that legal and ethical considerations are inherent and inseparable parts of good medical practice across the whole spectrum.

##### 2. Course Size and Credits:

Number of credits	2
Total hours of class room interaction during the semester	30
Number of Tutorial hours	00
Number of semester weeks	16
Department responsible	Allied Health Sciences.
Course marks	Total Marks: 50 The distribution of marks for theory component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

#### Teaching, Learning and Assessment

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Dean - Academics  
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Bangalore - 560 054

## 1.Course Outcomes

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Explain the key principles of the Indian Constitution
2.	<b>CO2:</b> Explain the medico-legal aspects of patient care including informed consent
3.	<b>CO3:</b> Discuss euthanasia, organ donation, the organ transplant act and care of terminally ill patient
4.	<b>CO4:</b> Discuss the scope and application of Medical Law
5.	<b>CO5:</b> Suggest strategies for protection of human rights and resolving legal issues in compliance with applicable laws

## 4. Course Contents:

- **Indian Constitution:** Democratic institutions. Bicameral system of Legislature. Fundamental rights and duties. Principles of states policies Special Rights for dalits, backwards, women and children and the religious and linguistic minorities Doctrine of Separation of Powers legislative in India the Election Commission Constitution and sustainable development in India
- **Medical ethics:** Definition, goal, scope Code of conduct Basic principles of medical ethics, Confidentiality, malpractice and negligence Rational and irrational drug therapy Autonomy and informed consent Right of patients Care of the terminally ill Euthanasia Organ transplantation and Human transplantation act.
- **Medico legal aspects of medical records:** Medico legal case and type. Records and documents related to MLC Ownership of medical records Confidentiality Privilege communication Release of medical information Unauthorized disclosure Retention of medical records Professional indemnity insurance policy Development of standardized protocol to avoid near miss or sentinel events Informed consent

## 21 Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)					
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8					PSO -1	PSO- 2	PSO -3	PSO -4
CO-1							1						1	1		
CO-2	1			2	2								1			
CO-3							2									
CO-4							1						1			
CO-5							1						1			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution																

## 4.Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>25</b>
<b>Demonstrations</b>		<b>00</b>
1.Demonstration using Videos	-	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		<b>00</b>
1.Solving Numerical Problems	-	
<b>Practical Work</b>		<b>00</b>
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		<b>00</b>
1.Case Study Presentation	-	
2.Guest Lecture	-	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	-	
6.Discussing Possible Innovations	-	

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<b>Written Examination (Mid-Term tests and SEE)</b>	<b>05</b>
<b>Total Duration in Hours</b>	<b>30</b>

## 22. Method of Assessment

<b>CE (60% weightage)</b>			<b>SEE (40% weightage)</b>
<b>SC1</b> (Term Tests) 30%	<b>SC2</b> (Innovative assignment) 10%	<b>SC3</b> (Written assignment) 20%	<b>SEE (Theory)</b> 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

## 8. Achieving learning outcomes

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

<b>SL.no</b>	<b>Curriculum and Capabilities Skills</b>	<b>How imparted during the course</b>
<b>1.</b>	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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

#### Recommended reading:

- Class Notes
- Donnelly, J. (1998) International Human Rights, 2nd edn, Westview Press
- J.C. Johari: The Constitution of India- A Politico-Legal Study-Sterling Publication, Pvt. Ltd. New Delhi.
- J.N . Pandey: Constitution Law of India, Allahbad, Central Law Agency, 1998.
- Granville Austin: The Indian Constitution - Corner Stone of a Nation-Oxford, New Delhi, 2000.
- Perry, M. (1998) The Idea of Human Rights, Oxford University Press
- K Swamyraj (2017), Law of Contract (General Principles), God's Grace Publication, New Delhi
- D DBasu (1983), Constitutional Law of India, Lexis Nexis Butter worths Publication, Nagpur
- Introduction to Intellectual Property Theory and Practice (1997), World Intellectual Property Organisation, Geneva
- Smith, R. (2007) Textbook on international human rights 3rd edn, Oxford University Press

#### Magazines and Journals Websites

- <http://industrialrelations.naukrihub.com/industrial-relation-policy.html>
- <http://labour.nic.in/>
- <http://whitepapers.businessweek.com/tlist/Legal-Environment.html>

#### Other Electronic Resources

Electronic resources on the course area are available on MSRUASlibrary

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<b>Course name</b>		Constitution of India
<b>Course code</b>		AHN203A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

  
 M. C. Kulkarni  
 University of Applied  
 Bangalore 560054



## Course Specifications: Nutrition

Course Title	Nutrition
Course Code	OPC211A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

This course covers the basic aspects of Nutrition for good health. It also includes nutrients and nutrient derivatives relevant to ocular health, nutrition deficiency and ocular disease, Nutrition and ocular aging, and contraindications, adverse reactions and ocular nutritional supplements.

#### 2. Course Size and Credits:

Number of credits	2
Total hours of class room interaction during the semester	30
Number of Tutorial hours	00
Number of semester weeks	16
Department responsible	Allied Health Sciences.
Course marks	Total Marks: 50 The distribution of marks for theory component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

#### 1.Course Outcomes

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M.A. Ramiah University of Applied Science  
Bangalore - 560 054

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Define the concepts of balanced diet and its importance
2.	<b>CO2:</b> Discuss the functions of food and diet-based disorders
3.	<b>CO3:</b> Brief about RDA and its role in diet planning
4.	<b>CO4:</b> Explain the functions of carbohydrates, proteins and lipids
5.	<b>CO5:</b> Elaborate on the importance of assessing nutritional status

#### 4. Course Contents:

- **Introduction:** History of Nutrition, Nutrition as a science, Food groups, RDA, Balanced diet, Assessment of nutritional status, Energy: Units of energy, energy expenditure, total energy/calorie requirement for different age groups and diseases, Energy imbalance, Measurements of energy and value of food (previous syllabus- now removed), Energy expenditure, Total energy/calorie requirement for different age groups and diseases, Satiety value, Energy imbalance- obesity, starvation, Limitations of the daily food guide.
- **Macronutrients:** Carbohydrates, Proteins and fats, Sources and Function, classification, digestion and absorption, macronutrient related eye disorders and role of macronutrients in ocular health
- **Proteins:** Sources and function, Digestion of Proteins, carbohydrates & lipids, Essential and non- essential amino- acids, Incomplete and complete proteins, Supplementary foods, PEM and the eye, Nitrogen balance, Changes in protein requirement.
- **Fats:** Sources and functions, Essential fatty acids, Excess and deficiency, Lipids and the eye, Hyperlipidemia, heart diseases, atherosclerosis.
- **Micronutrients:** General functions and sources, classification, role of micronutrients in ocular health
- **Minerals:** General functions and sources, Macro and micro minerals associated with the eye. Deficiencies and excess –ophthalmic complications (e.g. iron, calcium, iodine etc.)
- **Vitamins:** General functions, and food sources, Vitamin deficiencies and associated eye disorders with particular emphasis to Vitamin A, Promoting sound habits in pregnancy, lactation and infancy.
- **Antioxidants:** General functions and sources and role of antioxidants in ocular health, Antioxidants and other relevant Phyto nutrients. Properties
- **Essential amino acids.**
- **Miscellaneous:** Measles and associated eye disorders, low birth weight

### 23. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3	1	1					2	2			1
CO-2	3	2	1	1		1	1	2	2			1
CO-3	3	2	1	2			2	2	2			1
CO-4	3	2	1				2	2	2			1
CO-5	3	2	1	1	1	1	2	2	2			1
CO-6	3	2	2	1			1	1	2			1
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution												

### 4.Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>25</b>
<b>Demonstrations</b>		<b>00</b>
1.Demonstration using Videos	-	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		<b>00</b>
1.Solving Numerical Problems	-	
<b>Practical Work</b>		<b>00</b>
1.Course Laboratory	-	
2.Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		<b>00</b>
1.Case Study Presentation	-	
2.Guest Lecture	-	
3. Industry/Field Visit	-	

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4.Brain Storming Sessions	-	
5.Group Discussions	-	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>05</b>
<b>Total Duration in Hours</b>		<b>30</b>

#### 24. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

#### Recommended reading:

- Class Notes
- M Swaminathan: Hand book of Food and Nutrition, fifth edition, Bangalore printing & publishing Co.Lt Bangalore, 2004
- C Gopalan, BV Rama Sastri, SC Balasubramanian: Nutritive Value of Indian Foods, National Institute Nutrition, ICMR, Hyderabad, 2004
- Frank Eperjesi & Stephen Beatty: Nutrition and the Eye A practical Approach, Elsevier Butterworth Heinemann, USA, 2006

<b>Course name</b>		Nutrition
<b>Course code</b>		OPC211A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

## Course Specifications: Contact Lens I

Course Title	Contact Lens I
Course Code	OPC301A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

The subject provides the student with suitable knowledge both in theoretical and practical aspects of Contact Lenses. Upon completion of the course, the student should be able to: Understand the basics of contact lenses, List the important properties of contact lenses, finalise the CL design for various kinds patients, recognize various types of fitting, explain all the procedures to patient, identify and manage the adverse effects of contact lens

#### 2. Course Size and Credits:

Number of credits	3
Total hours of class room interaction during the semester	30
Number of practical hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	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	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

#### 3. Course Outcomes (CO)



Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Understand the basics of RGP contact lenses
2.	<b>CO2:</b> Enumerate different types of RGP contact lenses and their designs
3.	<b>CO3:</b> Recognize various types of fitting & troubleshoot
4.	<b>CO4:</b> Able to fit RGP contact lens on the patient cornea
5.	<b>CO5:</b> Explain all the care & maintenance procedures to patient

#### 4. Course Contents:

- Introduction to Contact lenses: Definition, Classification / Types, History of Contact Lenses, Optics of Contact Lenses, Magnification & Visual field, Accommodation & Convergence, Back & Front Vertex Power / Vertex distance calculation,
- Review of Anatomy & Physiology of Tear film, Cornea. Lids & Conjunctiva, Introduction to CL materials, Monomers, Polymers
- Properties of CL materials, Physiological (Dk, Ionicity, Water content), Physical (Elasticity, Tensile strength, Rigidity), Optical (Transmission, Refractive index), Indications and contraindications, Parameters / Designs of Contact Lenses & Terminology, RGP Contact Lens materials
- Manufacturing Rigid and Soft Contact Lenses – various methods
- Pre-Fitting examination – steps, significance, recording of results, Correction of Astigmatism with RGP lens
- Types of fit – Steep, Flat, Optimum – on spherical cornea with spherical lenses
- Types of fit – Steep, Flat, Optimum – on Toric cornea with spherical lenses, Calculation and finalizing Contact lens parameters, Ordering Rigid Contact Lenses – writing a prescription to the Laboratory, Checking and verifying Contact lenses from Laboratory, Modifications possible with Rigid lenses
- Care and Maintenance of Rigid lenses
- Complications of RGP lenses



### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8			PSO-1	PSO-2	PSO-3	PSO-4
CO-1		2									3			
CO-2	2	2										2		
CO-3	3	3						1				2		
CO-4	3	2						2			3			
CO-5	3	3		1				2						1

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		25
<b>Demonstrations</b>		00
1.Demonstration using Videos	-	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		00
1.Solving Numerical Problems	-	
<b>Practical Work</b>		
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		15
1.Case Study Presentation	05	
2.Guest Lecture	02	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	

7. Method of

5.Group Discussions	08	
6.Discussing Possible Innovations		
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>05</b>
<b>Total Duration in Hours</b>		<b>45</b>

#### Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

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SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

- IACLE modules 1 - 10
- CLAO Volumes 1, 2, 3
- Anthony J. Phillips : Contact Lenses, 5th edition, Butterworth-Heinemann, 2006
- Elisabeth A. W. Millis: Medical Contact Lens Practice, Butterworth-Heinemann, 2004
- E S. Bennett ,V A Henry :Clinical manual of Contact Lenses, 3rd edition, Lippincott Williams and Wilkins, 200

## 10. Course Organization

<b>Course name</b>		Contact Lens I
<b>Course code</b>		OPC301A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

## Course Specifications: Pediatric Optometry & Binocular Vision I

Course Title	Pediatric Optometry & Binocular Vision I
Course Code	OPC302A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

The subject provides the student with suitable knowledge both in theoretical and practical aspects of Contact Lenses. Upon completion of the course, the student should be able to: Understand the basics of contact lenses, List the important properties of contact lenses, finalize the CL design for various kinds patients, recognize various types of fitting, explain all the procedures to patient, identify and manage the adverse effects of contact lens

#### 2. Course Size and Credits:

Number of credits	3
Total hours of class room interaction during the semester	30
Number of practical hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	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	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

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### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Demonstrate clinical decision-making ability in the management of pediatric patient
2.	<b>CO2:</b> Perform optometric examination for pediatric patient
3.	<b>CO3:</b> Identify different types of binocular vision anomalies
4.	<b>CO4:</b> Investigate the presence of any sensory and motor adaptations

### 4. Course Contents:

- The Development of Eye and Vision
- History taking Pediatric subjects
- Assessment of visual acuity
- Normal appearance, pathology and structural anomalies of
- Orbit, Eye lids, Lacrimal system,
- Conjunctiva, Cornea, Sclera Anterior chamber, Uveal tract, Pupil
- Lens, vitreous, Fundus Oculomotor system
- Refractive Examination
- Determining binocular status
- Determining sensory motor adaptability
- Pediatric eye disorders: Cataract, Retinopathy of Prematurity, Retinoblastoma, Neuromuscular conditions, and Genetics
- Anterior segment dysgenesis, Aniridia, Microphthalmos, Coloboma, Albinism
- Spectacle dispensing for children
- Binocular Vision and Space perception: Relative subjective visual direction, Retino motor value, Grades of BSV, SMP and Cyclopean Eye, Correspondence, Fusion, Diplopia, Retinal rivalry, Horopter, Physiological Diplopia and Suppression, Stereopsis, Panum's area, BSV, Stereopsis and monocular clues – significance, Egocentric location, clinical applications, Theories of Binocular vision.
- Anatomy of Extra Ocular Muscles: Rectii and Obliques, LPS, Innervation & Blood Supply.
- Physiology of Ocular movements: Center of rotation, Axes of Fick, Action of individual muscle. Laws of ocular motility, Donder's and Listing's law, Sherrington's law, Hering's law, Uniocular & Binocular movements - fixation, saccadic & pursuits, Version & Vergence, Fixation & field of fixation, Near Vision Complex Accommodation, Definition and mechanism (process), Methods of measurement, Stimulus and innervation.
- Types of accommodation: Anomalies of accommodation – etiology and management.
- Convergence: Definition and mechanism, Methods of measurement, Types and components of convergence - Tonic, accommodative, fusional, proximal, Anomalies of

Convergence – etiology and management, Sensory adaptations, Confusion, Suppression, Investigations, Management, Blind spot syndrome, Abnormal Retinal Correspondence, Investigation and management, Eccentric Fixation, Investigation and management

##### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8			PSO-1	PSO-2	PSO-3	PSO-4
CO-1		2									3			
CO-2	2	2										2		
CO-3	3	3						1				2		
CO-4	3	2						2			3			
CO-5	3	3		1				2						1
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution														

##### 6. 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	-	
3.Demonstration on a Computer	-	
Numeracy		00
1.Solving Numerical Problems	-	
Practical Work		
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	

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4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		<b>15</b>
1.Case Study Presentation	05	
2.Guest Lecture	02	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	08	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>06</b>
<b>Total Duration In Hours</b>		<b>45</b>

#### 7. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other



After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

## 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

- Pradeep Sharma: Strabismus simplified, New Delhi, First edition, 1999, Modern publishers.
- Fiona J. Rowe: Clinical Orthoptics, second edition, 2004, Blackwell Science Ltd
- Gunter K. V. Mosby Company
- Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular Vision Heterophoric, Accommodative, and Eye Movement Disorders, 2008, Lippincott Williams & Wilkins publishers

### 10. Course Organization

Course name

Pediatric Optometry &

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Bangalore 560054

		Binocular Vision I
<b>Course code</b>		OPC302A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

*Handwritten signature*

**Head**  
 Department of Applied Health Sciences  
 M S Ramaiah University of Applied Sciences  
 Bangalore 560054

## Course Specifications: Low Vision & Geriatric Optometry

Course Title	Low Vision & Geriatric Optometry
Course Code	OPC303A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

This course deal with the definition of low vision, epidemiology aspect of visual impairment, types of low vision devices and its optical principles, clinical approach of the low vision patients, assistive devices for totally visually challenged, art of prescribing low vision devices and training the low vision patients and other rehabilitation measures.

#### 2. Course Size and Credits:

Number of credits	2
Total hours of class room interaction during the semester	15
Number of practical hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50 The distribution of marks for theory and laboratory/clinical component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

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 Bangalore - 560 054

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 Head  
 Department of Allied Health Sciences  
 Ramaiah University of Applied Sciences  
 Bangalore 560054

### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Define low vision and its epidemiology
2.	<b>CO2:</b> Describe the causes of low vision & clinical examination
3.	<b>CO3:</b> Appraise on training modalities with low vision devices
4.	<b>CO4:</b> Demonstrate clinical decision-making ability for geriatric

### 4. Course Contents:

- Definitions & classification of Low vision
- Epidemiology of low vision
- Model of low vision service
- Pre-clinical evaluation of low vision patients – prognostic & psychological factors; psycho-social impact of low vision.
- Types of low vision aids – optical aids, non-optical aids & electronic devices
- Clinical evaluation – assessment of visual acuity, visual field, selection of low vision aids, instruction & training
- Pediatric Low Vision care
- Low vision aids – dispensing & prescribing aspects
- Visual rehabilitation & counseling
- Structural, and morphological changes of eye in elderly
- Optometric examination of the elderly
- Common ocular diseases
- Spectacle and contact lens considerations

### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8			PSO-1	PSO-2	PSO-3	PSO-4
<b>CO-1</b>	3	1			2			2			3			1
<b>CO-2</b>	3	2						1			2		2	
<b>CO-3</b>	3							2			3	2		
<b>CO-4</b>	3	2		1	2		2	2			3	2		2

CO-5	3	3					2	3				3	2		2
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution															

#### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>15</b>
<b>Demonstrations</b>		
1.Demonstration using Videos	-	<b>00</b>
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		
1.Solving Numerical Problems	-	<b>00</b>
<b>Practical Work</b>		
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		
1.Case Study Presentation	05	<b>11</b>
2.Guest Lecture	-	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	06	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>04</b>
<b>Total Duration in Hours</b>		<b>30</b>

## 7. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

## 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

- Christine Dickinson: Low Vision: Principles and Practice Low vision care, 4th edition, Butterworth-Heinemann 1998
- Sarika G, Sailaja MVSE Vaithilingam: practice of Low vision –A guide book, Medical Research Foundation, 2015.

### Recommended reading:

- Richard L. Brilliant: Essentials of Low Vision Practice, Butterworth-Heinemann, 1999
- Helen Farral: optometric Management of Visual Handicap, Blackwell Scientific publications, 1991
- A J Jackson, J S Wolffsohn: Low Vision Manual, Butterworth Heinemann, 2007

## 10. Course Organization

<b>Course name</b>		Low Vision & Geriatric Optometry
<b>Course code</b>		OPC303A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026



## Course Specifications: Clinical Optometry III

Course Title	Clinical Optometry III
Course Code	OPC305A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

At the end of the course the students will be skilled in knowing the step-by-step procedures, documentation, and interpretation of contact lens fitting, basic binocular vision tests and low vision tests.

#### 2. Course Size and Credits:

Number of credits	07
Number of Practical Hours	120
Number of Tutorial hours	60
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	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

#### 1.Course Outcomes

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO 1:</b> Perform all types of soft contact lenses fitting
2.	<b>CO 2:</b> Assess soft contact lens fitting and understand different troubleshoot in soft contact lens fitting
3.	<b>CO 3:</b> Perform pediatric and geriatric ocular examination
4.	<b>CO 4:</b> Assess all the binocular vision components
5.	<b>CO 5:</b> Investigate the presence of any sensory and motor adaptations
6.	<b>CO 6:</b> Recognize the optical, non-optical, electronic and assistive devices for low vision patient

#### 4. Course Contents:

- History taking in pediatric and geriatric patients
- Complete evaluation of Contact lens, binocular assessment and Low vision assessments
- Investigation and diagnosis of binocular vision anomalies
- Determining the type of optical aid, telescope and its magnification

#### 25. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PSO-1	PSO-2	PSO-3	PSO-4
<b>CO-1</b>	2					1		2	3	1		
<b>CO-2</b>	3	1				2		3	2	1		1
<b>CO-3</b>	2	3							3	3		
<b>CO-4</b>	3	3						1	3			
<b>CO-5</b>	2	3							2			

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

## 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>00</b>
<b>Demonstrations</b>		<b>05</b>
1.Demonstration using Videos	05	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		<b>00</b>
1.Solving Numerical Problems	-	
<b>Practical Work</b>		<b>150</b>
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	75	
5.Hospital	75	
6.Model Studio	-	
<b>Others</b>		<b>35</b>
1.Case Study Presentation	15	
2.Guest Lecture	05	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	20	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>05</b>
<b>Total Duration In Hours</b>		<b>135</b>

## 7. Method of Assessment

CE Laboratory Component (60%)	SEE(40%)
(Formative laboratory performance assessment) (Log book/case presentations/hospital postings)	SEE (OSPE/OSCE)

60 Marks (20+20+20)	40 marks
---------------------	----------

In CE there shall be one subcomponents of CE namely Laboratory performance assessment. It is evaluated individually accounting to 60 marks as indicated in Course Specifications along with Logbook Report

After the laboratory subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. In summary, the ratio of Formative (Continuous Evaluation-CE) vs Summative (Semester End Examination-SEE) should be 60:40.

#### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

#### 9. Course Resources

##### 1. Essential Reading


- David Henson: Optometric Instrumentations, Butterworth- Heinemann, UK, 1991
- P R Yoder: Mounting Optics in Optical Instruments, SPIE Society of Photo- Optical Instrumentation, 2002

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- G Smith, D A. Atchison: The Eye and Visual Optical Instruments, Cambridge University Press, 1997

<b>Course name</b>		Clinical Optometry III
<b>Course code</b>		OPC305A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

  
 Department of Health Sciences  
 M S Kumari University of Applied Sciences  
 Bangalore, India

## Course Specifications: Project Management

Course Title	Project Management
Course Code	AHM305A
Department	Directorate of Transferable Skills and Leadership Development
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

With the advent of technology, changing business environments, varying economic conditions and prevailing political situations, a varied types of projects are being undertaken. This is seen in different segments such as infrastructure, construction, Information Technology, Manufacturing, Engineering, Health Care, Hospitality, Logistics and Services. Along with these, there is a big need for manpower with competencies in Managing different types and sizes of projects. A Project Management Professional equipped with,

- appropriate tools and techniques,
- an ability to apply appropriate methods and processes
- appropriate project leadership skills and
- a structured approach to manage a project in its entirety will be in a better position to
- ensure a project's defined success.

The course aims at imparting knowledge and developing competencies on various aspects of Project Management as per International Project Management Association's framework. This course also provides a glimpse of tools, techniques, methods and process for managing a project effectively. This course offers a structured approach which are derived from the experiences of a large number of successful global organizations.

### 2. Course Size and Credits:

Number of credits	03
Total hours of class room interaction during the semester	45
Number of practical hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50 The distribution of marks for theory and laboratory/clinical component for continuous and Semester end examination is as per the Programme

	specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

## Teaching, Learning and Assessment

### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO 1:</b> Explain the characteristics of projects, Operations and principles of Project Management
2.	<b>CO 2:</b> Discuss the Project Management Competency Elements as per PMA's Individual Competence Baseline Ver 4.0
3.	<b>CO 3:</b> Discuss the tools for Project Execution, Monitoring and control
4.	<b>CO 4:</b> Apply the tools for project planning and Create a Project Management Plan covering Project Charter, Work Breakdown Structure, Project Organisation, Time Management Plan and Risk Management Plan

### 4. Course Contents:

- **Section 1:** Introduction to Project, Programmes, Portfolio and Operations, Project Organization and Permanent Organization, Project Management Success, KRA, Creation of project, Need analysis, Business Case, Project Charter.
- **Section 2:** Requirements, Objectives & Benefits Scope WBS, Scope baseline, Change Management, Time Management, Lifecycle, AOA (ADM), AON (PDM), CPM, Floats, Network Exercises, Gantt Charts, Bar Charts, Resources, Resource Calendar
- **Section 3:** Controlling, Handling Changes, Phase end and Close out, Earned Value Management System, Variances, SPI & CPI, Numerical Exercises, Quality Management, Quality Planning, Quality Assurance, Quality Control, Quality Tools (Pareto Chart, Control Chart, Inspections, Benchmarking), Risk & Opportunity, Risk categories, Identification, Risk Analysis
- **Section 4:** Organization and Information, Stakeholder Management, Power and Interest, Culture and Values, Personal integrity and reliability, Personal communication, Communication Planning, Communication methods, Communication barriers, Conflict and crisis, Resourcefulness, Result Orientation

Department of Allied Health Sciences  
 MS Kulkarni  
 1/2/24



### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8			PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3	1			2			2			3			1
CO-2	3	2						1			2		2	
CO-3	3							2			3	2		
CO-4	3	2		1	2		2	2			3	2		2
CO-5	3	3					2	3			3	2		2

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>20</b>
<b>Demonstrations</b>		<b>00</b>
1.Demonstration using Videos	-	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		<b>00</b>
1.Solving Numerical Problems	-	
<b>Practical Work</b>		
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		<b>25</b>
1.Case Study Presentation	05	
2.Guest Lecture	-	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	20	

6. Discussing Possible Innovations	-
<b>Written Examination (Mid-Term tests and SEE)</b>	<b>05</b>
<b>Total Duration in Hours</b>	<b>50</b>

#### 7. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

- Course Notes
- Pinto Jeffrey K. (2019) Project Management: Achieving Competitive Advantage, 5<sup>th</sup> Edition, Pearson

### b. Recommended Readings

- Meredith, J.R. and Mantel, S.J. (2005) Project Management – a managerial approach, 6th edition Wiley
- Ghattas, R. G. and Sandra L. McKee (2001) Practical Project Management, New Jersey, Prentice Hall

### c. Magazines and Journals

- Project Manager Today
- PM network
- International Journal of Project and Operation Research, Inderscience
- Journal of Operation Management, Project and Operation Research, INFORMS

### d. Websites

- <http://www.providence.edu/mcs/rbg/mba.htm>

Approved by the Academic Council at its 32<sup>nd</sup> meeting held on 22<sup>nd</sup> June 2024

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- <http://library.kent.ac.uk/library/exampapers/deptcourses.php?dept=Business%20Studies>
- [http://homepages.stmartin.edu/fac\\_staff/dstout/MBA631/lecture\\_notes.htm](http://homepages.stmartin.edu/fac_staff/dstout/MBA631/lecture_notes.htm)

#### 10. Course Organization

<b>Course name</b>		Project Management
<b>Course code</b>		AHM305A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

  
 Department of Health Sciences  
 Faculty of Health Sciences

## Course Specifications: Systemic Diseases

Course Title	Systemic Diseases
Course Code	OPC304A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

This course deals with definition, classification, clinical diagnosis, complications and management of various systemic diseases. In indicated cases ocular manifestations also will be discussed. At the end of the course, students should get acquainted with the Common Systemic conditions, Ocular findings of the systemic conditions, First Aid knowledge

#### 2. Course Size and Credits:

Number of credits	02
Total hours of class room interaction during the semester	30
Number of practical hours	--
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50 The distribution of marks for theory and laboratory/clinical component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

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### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO 1:</b> Define systemic diseases and their diagnostic approaches
2.	<b>CO 2:</b> Describe the pathophysiology of the diseases
3.	<b>CO 3:</b> List the clinical features of those diseases
4.	<b>CO 4:</b> Describe the complications and management options for the diseases
5.	<b>CO 5:</b> List the ocular findings of the systemic conditions

### 4. Course Contents:

- **Hypertension:** Definition, classification, Epidemiology, clinical examination, complications, and management
- **Hypertensive retinopathy**
- **Diabetes Mellitus:** Classification, pathophysiology, clinical presentations, diagnosis, and management, Complications
- **Diabetic Retinopathy**
- **Thyroid Disease:** Physiology, testing for thyroid disease, Hyperthyroidism, Hypothyroidism, Thyroiditis, Thyroid tumors
- **Grave's Ophthalmopathy**
- **Acquired Heart Disease:** Ischemic Heart Disease, Congestive heart failure, Disorders of cardiac rhythm, Ophthalmic considerations
- **Cancer:** Incidence, Etiology, Therapy, Ophthalmologic considerations
- **Connective Tissue Disease:** Rheumatic arthritis, Systemic lupus erythematosus, Scleroderma, Polymyositis and dermatomyositis, Sjogren syndrome, Behcet's syndrome, Eye and connective tissue disease
- **Tuberculosis:** Aetiology, pathology, clinical features, pulmonary tuberculosis, diagnosis, complications, treatment tuberculosis and the eye.
- **Herpes virus** ( Herpes simplex, Varicella Zoster, Cytomegalovirus, Epstein Barr Virus) , Herpes and the eye
- **Hepatitis** (Hepatitis A, B, C): acquired immunodeficiency syndrome
- **Anemia:** Diagnosis, clinical evaluation, consequences, Sickle cell disease, treatment, Ophthalmologic considerations
- **Common Tropical Medical Ailments:** Malaria, Typhoid, Dengue, Filariases, Onchocerciasis , Cysticercosis, Leprosy
- **Nutritional and Metabolic disorders:** Obesity, Hyperlipidaemias, Kwashiorkor, Vitamin A Deficiency, Vitamin D Deficiency, Vitamin E Deficiency , Vitamin K Deficiency, Vitamin B1,B2,

Deficiency, Vitamin C Deficiency

- **Myasthenia Gravis**
- **First Aid:** General Medical Emergencies, Preoperative precautions in ocular surgeries
- **Psychiatry:** Basic knowledge of psychiatric condition and Patient Management
- **Genetics:** Introduction to genetics, Organisation of the cell, Chromosome structure and cell division, Gene structure and basic principles of Genetics, Genetic disorders and their diagnosis, Genes and the eye, Genetic counseling and genetic engineering.

##### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8			PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3	1			2			2			3			1
CO-2	3	2						1			2		2	
CO-3	3							2			3	2		
CO-4	3	2		1	2		2	2			3	2		2
CO-5	3	3					2	3			3	2		2

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

##### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		20
Demonstrations		00
1.Demonstration using Videos	-	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	00
Numeracy		
1.Solving Numerical Problems	-	00
Practical Work		
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	



4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		<b>25</b>
1.Case Study Presentation	05	
2.Guest Lecture	-	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	20	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>05</b>
<b>Total Duration in Hours</b>		<b>50</b>

## 7. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40 %

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

#### 9. Course Resources

##### 1. Essential Reading

- Course Notes
- C Haslett, E R Chilvers, N A boon, N R Coledge, J A A Hunter: Davidson's Principles and Practice of Medicine, Ed. John Macleod, 19th Ed., ELBS/Churchill Livingstone. (PPM), 2002
- 2. Basic and clinical Science course: Update on General Medicine, American Academy of Ophthalmology, Section 1, 1999

#### 10. Course Organization

<b>Course name</b>		Systemic Diseases
<b>Course code</b>		OPC304A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

  
**Head**  
 Department of Allied Health Sciences  
 M S Ramaiah University of Applied Sciences  
 Bangalore 560054

## Course Specifications: Contact Lens II

Course Title	Contact Lens -II
Course Code	OPC306A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

The subject provides the student with suitable knowledge both in theoretical and practical aspects of Contact Lenses. Upon completion of the course, the student should be able to Understand the basics of contact lenses, List the important properties of contact lenses, Finalise the CL design for various kinds patients' Recognize various types of fitting, explain all the procedures to patient, Identify and manage the adverse effects of contact lens

#### 2. Course Size and Credits:

Number of credits	02
Total hours of class room interaction during the semester	30
Number of practical hours	15
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	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	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

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### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Describe the basics of RGP contact lenses & Their designs
2.	<b>CO2:</b> Identify and solve various types of fitting & troubleshoot
3.	<b>CO3:</b> Explain all the care & maintenance procedures to patient
4.	<b>CO4:</b> Compare and contrast between RGP and SCL
5.	<b>CO5:</b> Describe the design and fitting of toric contact lens
6.	<b>CO6:</b> Perform specialty contact lens fitting and manage the complications

### 4. Course Contents:

- SCL Materials & Review of manufacturing techniques
- Comparison of RGP vs. SCL
- Pre-fitting considerations for SCL
- Fitting philosophies for SCL
- Fit assessment in Soft Contact Lenses: Types of fit – Steep, Flat, Optimum
- Calculation and finalising SCL parameters
- Soft Toric CL
- Stabilization techniques
- Parameter selection
- Fitting assessment
- Complications of Soft lenses
- Therapeutic contact lenses: Indications, Fitting consideration
- Specialty fitting
- Aphakia
- Pediatric
- Post refractive surgery
- Management of Presbyopia with Contact lenses

#### **PRACTICAL**

- Insertion and Removal
- Soft Contact Lens Fitting Assessment
- Fitting Toric soft Contact Lens
- Bandage Contact Lens
- Specialty Contact Lens fitting (Introduction)

## 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8			PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3					1		1			3	1		
CO-2	3	1				2		2			3	1		1
CO-3	3	3									3	3		
CO-4	3	3						1			3			
CO-5	3	3									3			
CO-6	3										3			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution														

## 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>24</b>
<b>Demonstrations</b>		<b>00</b>
1.Demonstration using Videos	-	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		<b>00</b>
1.Solving Numerical Problems	-	
<b>Practical Work</b>		<b>15</b>
1.Course Laboratory	15	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		<b>00</b>
1.Case Study Presentation	-	
2.Guest Lecture	-	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	

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5.Group Discussions	-	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>05</b>
<b>Total Duration in Hours</b>		<b>44</b>

#### 7. Method of Assessment

<b>CE (60% weightage)</b>			<b>SEE (40% weightage)</b>
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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



SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

- Anthony J. Phillips : Contact Lenses, 5th edition, Butterworth-Heinemann, 2006
- Elisabeth A. W. Millis: Medical Contact Lens Practice, Butterworth-Heinemann, 2004
- E S. Bennett ,V A Henry :Clinical manual of Contact Lenses, 3rd edition, Lippincott Williams and Wilkins, 2008

## 10. Course Organization

<b>Course name</b>		Contact Lens II
<b>Course code</b>		OPC306A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

## Course Specifications: Binocular Vision II

Course Title	Binocular Vision-II
Course Code	OPC307A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

This course deals with understanding of strabismus, its classification, necessary orthoptic investigations, diagnosis and non-surgical management. Along with theoretical knowledge it teaches the clinical aspects and application. The objective of this course is to inculcate the student with the knowledge of different types of strabismus its etiology signs and symptoms, necessary investigations and also management. The student on completion of the course should be able to independently investigate and diagnose case of strabismus with comments in respect to retinal correspondence and binocular single vision. The student should be able to perform all the investigations to check retinal correspondence, state of Binocular Single Vision, angle of deviation and special investigations for paralytic strabismus.

#### 2. Course Size and Credits:

Number of credits	03
Total hours of class room interaction during the semester	30
Number of practical hours	30
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	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	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

## Teaching, Learning and Assessment

### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Identify different types of binocular vision anomalies
2.	<b>CO2:</b> Describe the different methods of vision therapy
3.	<b>CO3:</b> Discuss the sensory adaptations in binocular vision anomalies
4.	<b>CO4:</b> Perform vision therapy for a particular binocular vision anomaly
5.	<b>CO5:</b> Investigate the presence of any sensory and motor adaptations
6.	<b>CO6:</b> Describe & comparing different strategies for managing binocular vision anomalies

### 4. Course Contents:

- Neuro-muscular anomalies
- Classification and etiological factors
- History – recording and significance.
- Convergent strabismus
- Accommodative convergent squint
- Classification
- Investigation and Management
- Non accommodative Convergent squint
- Classification
- Investigation and Management
- Divergent Strabismus
- Classification
- A& V phenomenon
- Investigation and Management
- Vertical strabismus
- Classification
- Investigation and Management
- Paralytic Strabismus
- Acquired and Congenital
- Clinical Characteristics
- Distinction from comitant and restrictive Squint
- Investigations

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- History and symptoms
- Head Posture
- Diplopia Charting
- Hess chart
- PBCT
- Nine directions
- Binocular field of vision
- Amblyopia and Treatment of Amblyopia
- Nystagmus
- Non-surgical Management of Squint
- Restrictive Strabismus
- Features
- Musculo-fascical anomalies
- Duane's Retraction syndrome
- Clinical features and management
- Brown's Superior oblique sheath syndrome
- Strabismus fixus
- Congenital muscle fibrosis
- Surgical management
- **PRACTICAL:** Deals with hand-on session the basic binocular vision evaluation

#### 5. Course Map (CO-PO PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8			PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3					1		1			3	1		
CO-2	3	1				2		2			3	1		1
CO-3	3	3									3	3		
CO-4	3	3						1			3			
CO-5	3	3									3			
CO-6	3										3			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution														

#### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in	Total Duration in
-------------------------------	-------------	-------------------

	hours	Hours
<b>Face to Face Lectures</b>		<b>24</b>
<b>Demonstrations</b>		<b>04</b>
1.Demonstration using Videos	-	
2.Demonstration using Physical Models/ Systems	04	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		<b>00</b>
1.Solving Numerical Problems	-	
<b>Practical Work</b>		<b>25</b>
1.Course Laboratory	15	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	05	
5.Hospital	05	
6.Model Studio	-	
<b>Others</b>		<b>02</b>
1.Case Study Presentation	02	
2.Guest Lecture	-	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	-	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>05</b>
<b>Total Duration in Hours</b>		<b>60</b>

## 7. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test

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- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

- Gunter K. Von Noorden: BURIAN- VON NOORDEN'S Binocular vision and ocular motility theory and management of strabismus, Missouri, Second edition, 1980, C. V. Mosby Company
- Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular Vision Heterophoric, Accommodative, and Eye Movement Disorders, 2008, Lippincot Williams & Wilkins publishers

## 10. Course Organization

<b>Course name</b>		Binocular Vision II
<b>Course code</b>		OPC307A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

*1/03/24*  
 Head  
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## Course Specifications: Public Health and Community Optometry

Course Title	Public Health and Community Optometry
Course Code	OPC308A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

Introduction to the foundation and basic sciences of public health optometry with an emphasis on the epidemiology of vision problems especially focused on Indian scenario. At the end of the course students will be knowledgeable in Community based eye care in India, prevalence of various eye diseases, developing Information Education Communication materials on eye and vision care for the benefit of the public, organize health education programmes in the community, vision screening for various eye diseases in the community and for different age groups.

#### 2. Course Size and Credits:

Number of credits	02
Total hours of class room interaction during the semester	30
Number of practical hours	00
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50 The distribution of marks for theory and laboratory/clinical component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

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### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Explain public health optometry and community-based eye care in India
2.	<b>CO2:</b> Describe in detail about tele optometry, vision 2020, NPCB program
3.	<b>CO3:</b> Develop Information, education & communication materials on eye and vision care for the benefit of the public
4.	<b>CO4:</b> Organize health education programs in the community
5.	<b>CO5:</b> Perform vision screening for various eye diseases in the community and for different age groups
6.	<b>CO6:</b> Evaluate and assess health care programme

### 4. Course Contents:

- Public Health Optometry: Concepts and implementation, Stages of diseases
- Dimensions, determinants and indicators of health
- Levels of disease prevention and levels of health care patterns
- Epidemiology of blindness – Defining blindness and visual impairment
- Community Eye Care Programs-Community based rehabilitation programs
- Nutritional Blindness with reference to Vitamin A deficiency
- Vision 2020: The Right to Sight
- National and International health agencies, NPCB
- Role of an optometrist in Public Health
- Organization and Management of Eye Care Programs – Service Delivery models
- Evaluate and assess few eyes health care Programmes
- Basics of Tele Optometry and its application in Public Health
- Information, Education and Communication for Eye Care programs

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### 5. Course Map (CO-PO-PSO Map)

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	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8			PSO-1	PSO-2	PSO-3	PSO-4
CO-1	3					1		1			3	1		
CO-2	3	1				2		2			3	1		1
CO-3	3	3									3	3		
CO-4	3	3						1			3			
CO-5	3	3									3			
CO-6	3										3			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution														

#### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>15</b>
<b>Demonstrations</b>		<b>00</b>
1.Demonstration using Videos	-	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		<b>00</b>
1.Solving Numerical Problems	-	
<b>Practical Work</b>		
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	-	
6.Model Studio	-	
<b>Others</b>		<b>15</b>
1.Case Study Presentation	05	
2.Guest Lecture	05	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	05	

6. Discussing Possible Innovations	
<b>Written Examination (Mid-Term tests and SEE)</b>	<b>05</b>
<b>Total Duration in Hours</b>	<b>35</b>

## 7. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

## 8. Achieving learning outcomes

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

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*[Signature]*  
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Department of Allied Health Sciences  
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SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

- GVS Murthy, S K Gupta, D Bachani: The principles and practice of community Ophthalmology, National programme for control of blindness, New Delhi, 2002
- Newcomb RD, Jolley JL : Public Health and Community Optometry, Charles C Thomas Publisher, Illinois, 1981

### Recommended reading:

#### TEXT BOOKS:

- K Park: Park's Text Book of Preventive and Social Medicine, 19th edition,
- Banarsidas Bhanot publishers, Jabalpur, 2007

## 10. Course Organization

<b>Course name</b>		Public Health and Community Optometry
<b>Course code</b>		OPC308A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

## Course Specifications: Occupational Optometry and Practice Management

Course Title	Occupational Optometry and Practice Management
Course Code	OPC309A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

### 2. Course Summary

#### 1. Aim and Summary

This course deals with general aspects of occupational health, Visual demand in various job, task analysing method, visual standards for various jobs, occupational hazards and remedial aspects through classroom sessions and field visit to the factories. At the end of the course the students will be knowledgeable in visual requirements of jobs; In effects of physical, chemical and other hazards on eye and vision. To identify occupational causes of visual and eye problems; To be able to prescribe suitable corrective lenses and eye protective wear and to set visual requirements, standards for different jobs.

#### 2. Course Size and Credits:

Number of credits	02
Total hours of class room interaction during the semester	30
Number of practical hours	00
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	Total Marks: 50 The distribution of marks for theory and laboratory/clinical component for continuous and Semester end examination is as per the Programme specification
Pass requirement	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

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### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Determine visual requirement of jobs
2.	<b>CO2:</b> Describe the effects of physical, chemical and other hazards on eye and vision
3.	<b>CO3:</b> Identify occupational causes of visual and eye problems
4.	<b>CO4:</b> Prescribe suitable corrective lenses and eye protective wear specific to a job
5.	<b>CO5:</b> Able to set visual requirements and standards for different jobs
6.	<b>CO6:</b> Determine visual requirement of jobs

### 4. Course Contents:

#### Occupational Optometry

- Introduction to Occupational health, hygiene and safety, international bodies like ILO, WHO, National bodies etc. Acts and Rules - Factories Act, WCA, ESI Act.
- Electromagnetic Radiation and its effects on Eye
- Illumination- definition, measurements and standards
- Color – Definition, Color theory, Color coding, Color defects, Color Vision tests
- Occupational hazards and preventive/protective methods
- Industrial Vision Screening – Modified clinical method and Industrial Vision test
- Standards – Visual standards for jobs
- Visual Display Units
- Contact lens and work

#### Practice management

- Building up a successful optometry practice
- Organizing an office: location, staff, appointments, setting fees, patient communications, record keeping, inventory management, recall system, ophthalmic dispensing, management of referrals, inter professional relations, role of computers in your practice
- Business Plan: Marketing plan, finance, analysis of practice, planning for further growth
- Professionalism and Values: Confidentiality; ethical or moral values



### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8			PSO-1	PSO-2	PSO-3	PSO-4
CO-1	2	1									3			
CO-2	3	1					1				3			
CO-3	3	1									3			
CO-4	3	3					1				3			
CO-5	3	2									3			
CO-6	3	1					1				3			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution														

### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
Face to Face Lectures		26
Demonstrations		00
1.Demonstration using Videos	-	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
Numeracy		00
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	-	

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<b>Others</b>		<b>00</b>
1. Case Study Presentation	-	
2. Guest Lecture	-	
3. Industry/Field Visit	-	
4. Brain Storming Sessions	-	
5. Group Discussions	-	
6. Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>04</b>
<b>Total Duration in Hours</b>		<b>30</b>

#### 7. Method of Assessment

<b>CE (60% weightage)</b>			<b>SEE (40% weightage)</b>
SC1 (Term Tests) 30%	SC2 (Innovative assignment) 10%	SC3 (Written assignment) 20%	SEE (Theory) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

## 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

- Dr. Santanam's text book of Occupational optometry. 1st edition, Published by Elite School of optometry, unit of Medical Research Foundation, Chennai, India, 2015
- R V North: Work and the eye, Second edition, Butterworth Heinemann, 2001
- G W Good: Occupational Vision Manual available in the following website: [www.aoa.org](http://www.aoa.org)
- N.A. Smith: Lighting for Occupational Optometry, HHSC Handbook Series, Safchem Services, 1999
- J Anshel: Visual Ergonomics Handbook, CRC Press, 2005
- G Carson, S Doshi, W Harvey: Eye Essentials: Environmental & Occupational Optometry, Butterworth-Heinemann, 2008

### 10. Course Organization

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## Course Specifications: Clinical Optometry IV

Course Title	Clinical Optometry IV
Course Code	OPC310A
Department	Allied Health Science
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

Upon completion of the course, the student should be able to demonstrate the practical skills in performing basic clinical tests/examinations of anterior eye segment.

#### 2. Course Size and Credits:

Number of credits	07
Total hours of class room interaction during the semester	00
Number of practical hours	210
Number of semester weeks	16
Department responsible	Allied Health Sciences
Course evaluation	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	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

Teaching, Learning and Assessment

### 3. Course Outcomes (CO)

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Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO 1:</b> Understand the basics of soft contact lenses
2.	<b>CO 2:</b> Enumerate different types of soft contact lenses and their designs
3.	<b>CO 3:</b> Recognize various types of fitting & troubleshoot
4.	<b>CO 4:</b> Identify different types of binocular vision anomalies
5.	<b>CO 5:</b> Investigate the presence of any sensory and motor adaptations
6.	<b>CO 6.:</b> Recognize the optical, non-optical, electronic and assistive devices

#### 4. Course Contents:

- Complete Ocular Examination including refraction, slit lamp, IOP, fundus examination
- Complete evaluation of Contact lens, binocular assessment and Low vision assessments
- Investigation of binocular vision anomalies
- Determining the type of optical aid, telescope and its magnification
- Diagnosis of binocular vision anomalies and clinical management of the same

#### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)								Programme Specific Outcomes (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PSO-1	PSO-2	PSO-3	PSO-4
<b>CO-1</b>	2					1		2	3	1		
<b>CO-2</b>	3	1				2		3	2	1		1
<b>CO-3</b>	2	3							3	3		
<b>CO-4</b>	3	3						1	3			
<b>CO-5</b>	2	3							2			

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

#### 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		<b>0</b>
<b>Demonstrations</b>		<b>20</b>
1.Demonstration using Videos	05	
2.Demonstration using Physical Models/ Systems	15	

3.Demonstration on a Computer	-	
<b>Numeracy</b>		<b>00</b>
1.Solving Numerical Problems	-	
<b>Practical Work</b>		<b>150</b>
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	75	
5.Hospital	75	
6.Model Studio	-	
<b>Others</b>		<b>40</b>
1.Case Study Presentation	20	
2.Guest Lecture	-	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	20	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		<b>10</b>
<b>Total Duration in Hours</b>		<b>210</b>

## 7. Method of Assessment

Laboratory Component CE (60%)	SEE(40%)
(Formative laboratory performance assessment) (Log book/case presentations/hospital postings)	SEE (OSPE/OSCE)
60 Marks (20+20+20)	40 marks

In CE there shall be one subcomponents of CE namely Laboratory performance assessment. It is evaluated individually accounting to 60 marks as indicated in Course Specifications along with Logbook Report

After the laboratory subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. In summary, the ratio of Formative (Continuous Evaluation-CE) vs Summative (Semester End Examination-SEE) should be 60:40.

## 8. Achieving learning outcomes

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

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SL.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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

- course notes
- David Henson: Optometric Instrumentations, Butterworth- Heinemann, UK, 1991
- P R Yoder: Mounting Optics in Optical Instruments, SPIE Society of Photo- Optical Instrumentation, 2002
- G Smith, D A. Atchison: The Eye and Visual Optical Instruments, Cambridge University Press, 1997

<b>Course name</b>		Clinical Optometry IV
<b>Course code</b>		OPC310A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

## Course Specifications: Research Project

Course Title	Research Project
Course Code	OPC401A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

The aim of this course is to give students an experience of addressing a real time problem in Optometry. 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 / develop a physical product and write a project report.

#### 2. Course Size and Credits:

Number of credits	10
Total hours of class room interaction during the semester	290
Number of practical hours	00
Number of semester weeks	29
Department responsible	Allied Health Sciences
Course evaluation	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	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

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### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Refine the problem in Allied Health Science
2.	<b>CO2:</b> Identify appropriate methodology to solve the problem
3.	<b>CO3:</b> Propose solutions to the problem identified
4.	<b>CO4:</b> Prepare a project report as per the specified guidelines
5.	<b>CO5:</b> Presentation of the research finding in an appropriate forum

### 4. Course Contents:

- Identifying a problem for which a better or new solution is required, through literature review
- To learn PICO search and evidence
- Defining the scope of the problem followed by aim and objectives
- Identifying the methodology to meet the objectives
- Data collection, analysis and interpretation
- Preparing/ writing a project report and presentation in appropriate forum

### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8			PSO-1	PSO -2	PSO -3	PSO -4
<b>CO -1</b>	2							2			1			
<b>CO -2</b>	2	2									2			
<b>CO -3</b>	2							2						2
<b>CO -4</b>	2						2				2		2	
<b>CO -5</b>		3				2	2						2	2
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution														

## 6. Course Teaching and Learning Methods

Teaching and Learning Methods		Duration in hours
1.	Refining Problem, Aim, Objective & Methodology in concurrence with academic guide	50
2.	Review Plan, design and execution of experiments	50
3.	Data collection, Analysis and Interpretation	150
4.	Discussion with supervisor	10
5.	Propose Solution	20
6.	Report Presentation	10
Total Duration Hours		60

## 7. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Protocol Presentation) 30%	SC2 (Data collection) 10%	SC3 (Analysis) 20%	SEE (Thesis Presentation) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam

Approved by the Academic Council at its 32th meeting held on 22<sup>nd</sup> June 2024

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 Head  
 Department of Allied Health Sciences  
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- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.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.	Leadership Skills	Group discussions

#### 9. Course Resources

##### 1. Essential Reading

- Gurumani, N., 2006, Research methodology for biological sciences, MJP Publishers
- Gurumani, N., 2010, *Scientific Thesis Writing And Paper Presentation*, 1<sup>st</sup> Edition, MJP Publishers.
- <https://www.ncbi.nlm.nih.gov/pubmed>
- <https://www.sciencedirect.com/>
- <https://www.biomedcentral.com/>

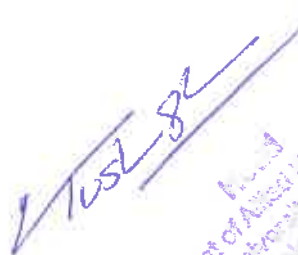
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- <http://www.nature.com/>
- <https://www.cell.com/>
- Journals related to the respective topics of research

#### 10. Course Organization

<b>Course name</b>		Research Project
<b>Course code</b>		OPC401A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

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## Course Specifications: Internship

Course Title	Internship
Course Code	OPI401A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

This internship training deals with postings in specialty units of the Ophthalmology. The students are trained to acquire skills for the actual conduct of all the clinical services entrusted to them in the specialty units leading to the emergence of trained Optometrist.

#### 2. Course Size and Credits:

Number of credits	10
Total hours of class room interaction during the semester	290
Number of practical hours	00
Number of semester weeks	29
Department responsible	Allied Health Sciences
Course evaluation	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	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment



Sl. No	Postings	Duration in weeks
1	General OPD	10
2	Contact Lens Department	4
3	Low Vision Care Clinic	2
4	Binocular Vision Clinic	4
5	Ophthalmology Clinic	3
6	Opticals	1
7	Camps	5

### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Perform routine eye examination
2.	<b>CO2:</b> Evaluation in specialty areas of optometry - Contact lens, Binocular Vision and Low vision care
3.	<b>CO3:</b> Perform diagnostics ocular investigations
4.	<b>CO4:</b> Describe the referrals and follow-up criteria

### 4. Course Contents:

- Internship is a phase of training where in a student is expected to conduct actual practice and acquires 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

- Identifying a problem for which a better or new solution is required, through literature review
- Measurement of Ocular dimensions
- Pupillary diameter and lid characteristics
- Blink rate and TBUT
- Schrimers test
- Slit lamp examination
- Visual acuity assessment and Retinoscopy and Subjective refraction
- Fundus Examination
- Determining the type of telescope and its magnification (Direct comparison method & calculated method)

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- Determining the change in field of view with different magnification and different eye to lens distances with telescopes and magnifiers.
- Inducing visual impairment and prescribing magnification.
- Determining reading speed with different types of low vision aids with same magnification.
- Determining reading speed with a low vision aid of different magnifications
- Keratometry
- Placido's disc
- Soft Contact Lens fitting – Aspherical
- Soft Contact Lens fitting – Lathecut lenses Soft Contact Lens over refraction
- Lens insertion and removal Lens handling and cleaning Examination of old soft Lens
- RGP Lens fitting
- RGP Lens fitting
- RGP Lens Fit Assessment and fluorescein pattern
- Special RGP fitting (Aphakia, pseudo phakia & Keratoconus) RGP over refraction and Lens flexure
- Examination of old RGP Lens RGP Lens parameters
- Slit lamp examination of Contact Lens wearers
- Binocular Vision Assessments - EOM, Cover test,
- Sensory assessments - W4DT, stereopsis
- Accommodation - Amplitude, Facility and Response
- Vergence - Amplitude, Facility
- Dynamic retinoscopy
- Hess chart and Diplopia charting
- Diagnose binocular vision anomalies
- Diagnostic Procedures
- Visual field testing (HFA)
- Lacrimal syringing
- Topography
- Retinal imaging (OCT)

#### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)												Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8					PSO -1	PSO -2	PSO -3	PSO-4
CO-1	3							1					3	2		
CO-2	3	2											3	2		
CO-3	3	2					2						3	2		2
CO-4	1	3	2										2		2	
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution																

## 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		0
<b>Demonstrations</b>		00
1.Demonstration using Videos	-	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		00
1.Solving Numerical Problems	-	
<b>Practical Work</b>		290
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	290	
6.Model Studio	-	
<b>Others</b>		00
1.Case Study Presentation	-	
2.Guest Lecture	-	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	-	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		00
<b>Total Duration in Hours</b>		290

## 8. Method of Assessment

CE (60% weightage)		SEE (40% weightage)
SC1 (Formative Laboratory performance assessment) 30%	SC2 (Log book) 30%	SEE (OSPE/OSCE) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60%

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Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60% Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.no	Curriculum and Capabilities Skills	How imparted during the course
1.	Knowledge	Class room lectures
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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.	Leadership Skills	Group discussions

## 9. Course Resources

### 1. Essential Reading

- A K Khurana: Comprehensive Ophthalmology, 4th edition, New age international(p) Ltd. Publishers, New Delhi, 2007
- D B. Elliott :Clinical Procedures in Primary Eye Care,3rd edition, Butterworth-Heinemann, 2007
- Jack J. Kanski Clinical Ophthalmology: A Systematic Approach,6th edition, Butterworth-Heinemann, 2007
- J.B Eskridge, J F. Amos, J D. Bartlett: Clinical Procedures in Optometry, Lippincott Williams and Wilkins,1991
- N B. Carlson , DI Kurtz: Clinical Procedures for Ocular Examination ,3rd edition, McGraw-Hill Medical, 2003
- Journals and Magazines Webs Other Electronic Resources

## 10. Course Organization

<b>Course name</b>		Internship
<b>Course code</b>		OPI401A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

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*[Signature]*  
**Dean - Academics**  
 S. Ramaiah University of Applied Sciences  
 Bangalore - 560 054

## Course Specifications: Research Project

Course Title	Research Project
Course Code	OPC402A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

The aim of this course is to give students an experience of addressing a real time problem in Optometry. 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 / develop a physical product and write a project report.

#### 2. Course Size and Credits:

Number of credits	10
Total hours of class room interaction during the semester	290
Number of practical hours	00
Number of semester weeks	29
Department responsible	Allied Health Sciences
Course evaluation	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	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment



### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Refine the problem in Allied Health Science
2.	<b>CO2:</b> Identify appropriate methodology to solve the problem
3.	<b>CO3:</b> Propose solutions to the problem identified
4.	<b>CO4:</b> Prepare a project report as per the specified guidelines
5.	<b>CO5:</b> Presentation of the research finding in an appropriate forum

### 4. Course Contents:

- Identifying a problem for which a better or new solution is required, through literature review
- To learn PICO search and evidence
- Defining the scope of the problem followed by aim and objectives
- Identifying the methodology to meet the objectives
- Data collection, analysis and interpretation
- Preparing/ writing a project report and presentation in appropriate forum

### 5. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8			PSO-1	PSO -2	PSO -3	PSO -4
CO -1	2							2			1			
CO -2	2	2									2			
CO -3	2							2						2
CO -4	2						2				2		2	
CO -5		3				2	2						2	2

3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution

### 6. Course Teaching and Learning Methods

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Teaching and Learning Methods		Duration in hours
1.	Refining Problem, Aim, Objective & Methodology in concurrence with academic guide	50
2.	Review Plan, design and execution of experiments	50
3.	Data collection, Analysis and Interpretation	150
4.	Discussion with supervisor	10
5.	Propose Solution	20
6.	Report Presentation	10
Total Duration Hours		60

#### 9. Method of Assessment

CE (60% weightage)			SEE (40% weightage)
SC1 (Protocol Presentation) 30%	SC2 (Data collection) 10%	SC3 (Analysis) 20%	SEE (Thesis Presentation) 25%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

- Online Test
- Assignments/Problem Solving
- Field Assignment
- Open Book Test
- Portfolio
- Reports
- Case Study
- Group Task
- Laboratory / Clinical Work Record
- Computer Simulations
- Creative Submission
- Virtual Labs
- Viva / Oral Exam
- Lab Manual Report
- Any other

After the three subcomponents are evaluated, the CE component marks are consolidated to attain 60%

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Weightage. The Semester End Examination shall be a 2-hour 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.

#### 8. Achieving learning outcomes

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

SL.no	Curriculum and Capabilities Skills	How imparted during the course
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8.	Self-Learning	Seminars
9.	Written Communication Skills	Examination
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11.	Presentation Skills	Seminars, Case discussions
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- <https://www.ncbi.nlm.nih.gov/pubmed>
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- Journals related to the respective topics of research

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 Dean - Academics  
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 Bangalore - 560 054

#### 10. Course Organization

<b>Course name</b>		Research Project
<b>Course code</b>		OPC402A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026

## Course Specifications: Internship

Course Title	Internship
Course Code	OPI402A
Department	Allied Health Sciences
Faculty	Faculty of Life and Allied Health Sciences

### 1. Course Summary

#### 1. Aim and Summary

This internship training deals with postings in specialty units of the Ophthalmology. The students are trained to acquire skills for the actual conduct of all the clinical services entrusted to them in the specialty units leading to the emergence of trained Optometrist.

#### 2. Course Size and Credits:

Number of credits	10
Total hours of class room interaction during the semester	290
Number of practical hours	00
Number of semester weeks	29
Department responsible	Allied Health Sciences
Course evaluation	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	As per the Academic Regulations
Attendance requirement	As per the Academic Regulations

### Teaching, Learning and Assessment

### 3. Course Outcomes (CO)

Upon completion of this course students will be able to:

No.	Course outcome
1.	<b>CO1:</b> Perform routine eye examination
2.	<b>CO2:</b> Evaluation in specialty areas of optometry - Contact lens, Binocular Vision and Low vision care
3.	<b>CO3:</b> Perform diagnostics ocular investigations
4.	<b>CO4:</b> Describe the referrals and follow-up criteria

#### Course Contents:

- Internship is a phase of training where in a student is expected to conduct actual practice and acquires 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

Sl. No	Postings	Duration in weeks
1	General OPD	10
2	Contact Lens Department	4
3	Low Vision Care Clinic	2
4	Binocular Vision Clinic	4
5	Ophthalmology Clinic	3
6	Opticals	1
7	Camps	5

- Identifying a problem for which a better or new solution is required, through literature review
- Measurement of Ocular dimensions
- Pupillary diameter and lid characteristics
- Blink rate and TBUT
- Schrimers test

- Slit lamp examination
- Visual acuity assessment and Retinoscopy and Subjective refraction
- Fundus Examination
- Determining the type of telescope and its magnification (Direct comparison method & calculated method)
- Determining the change in field of view with different magnification and different eye to lens distances with telescopes and magnifiers.
- Inducing visual impairment and prescribing magnification.
- Determining reading speed with different types of low vision aids with same magnification.
- Determining reading speed with a low vision aid of different magnifications
- Keratometry
- Placido's disc
- Soft Contact Lens fitting – Aspherical
- Soft Contact Lens fitting – Lathecut lenses Soft Contact Lens over refraction
- Lens insertion and removal Lens handling and cleaning Examination of old soft Lens
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- RGP Lens fitting
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- Special RGP fitting (Aphakia, pseudo phakia & Keratoconus) RGP over refraction and Lens flexure
- Examination of old RGP Lens RGP Lens parameters
- Slit lamp examination of Contact Lens wearers
- Binocular Vision Assessments - EOM, Cover test,
- Sensory assessments - W4DT, stereopsis
- Accommodation - Amplitude, Facility and Response
- Vergence - Amplitude, Facility
- Dynamic retinoscopy
- Hess chart and Diplopia charting
- Diagnose binocular vision anomalies
- Diagnostic Procedures
- Visual field testing (HFA)
- Lacrimal syringing
- Topography
- Retinal imaging (OCT)

#### 6. Course Map (CO-PO-PSO Map)

	Programme Outcomes (POs)										Programme Specific Outcomes (PSOs)			
	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8			PSO -1	PSO -2	PSO -3	PSO-4
CO-1	3							1			3	2		
CO-2	3	2									3	2		
CO-3	3	2					2				3	2		2

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CO-4	1	3	2									2		2	
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution															

## 6. Course Teaching and Learning Methods

Teaching and Learning Methods	Duration in hours	Total Duration in Hours
<b>Face to Face Lectures</b>		0
<b>Demonstrations</b>		00
1.Demonstration using Videos	-	
2.Demonstration using Physical Models/ Systems	-	
3.Demonstration on a Computer	-	
<b>Numeracy</b>		00
1.Solving Numerical Problems	-	
<b>Practical Work</b>		290
1.Course Laboratory	-	
2. Computer Laboratory	-	
3.Engineering Workshop/Course/Workshop/Kitchen	-	
4.Clinical Laboratory	-	
5.Hospital	290	
6.Model Studio	-	
<b>Others</b>		00
1.Case Study Presentation	-	
2.Guest Lecture	-	
3. Industry/Field Visit	-	
4.Brain Storming Sessions	-	
5.Group Discussions	-	
6.Discussing Possible Innovations	-	
<b>Written Examination (Mid-Term tests and SEE)</b>		00
<b>Total Duration in Hours</b>		290

## 10. Method of Assessment



CE (60% weightage)		SEE (40% weightage)
SC1 (Formative Laboratory performance assessment) 30%	SC2 (Log book) 30%	SEE (OSPE/OSCE) 40%

In CE there shall be three subcomponents of CE (SC1, SC2, and SC3), namely Mid Term; Written Assignment; Innovative assignments. Each subcomponent is evaluated individually accounting to 60% Weightage as indicated in Course Specifications. The innovative assignment subcomponents can be of any of the following types:

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- Journals and Magazines Webs Other Electronic Resources

## 10. Course Organization

<b>Course name</b>		Internship
<b>Course code</b>		OPI402A
<b>Course Leader/s Name</b>		
<b>Course Leader Contact Details</b>	<b>Phone:</b>	080 – 49065555
	<b>E- mail:</b>	
<b>Course Specifications Approval</b>		June 2022
<b>Next Course Specifications Review</b>		June 2026



