MAHATMA GANDHI UNIVERSITY
of
MEDICAL SCIENCES & TECHNOLOGY
JAIPUR

Syllabus

B.Sc. Ophthalmic Techniques and Optometry

(Three Years Program)

Edition 2020-21

Notice

1. Amendments made by the Board of Management of the University in Rules/ Regulations of Graduate Medical Courses shall automatically apply to the Rules/ Regulations of the Mahatma Gandhi University of Medical Sciences & Technology.

2. The University reserves the right to make changes in the syllabus/ books/ guidelines, fee-structure or any other information at any time without prior notice. The decision of the University shall be binding on all.

3. The jurisdiction of all court cases shall be Jaipur Bench of Hon'ble Rajasthan High Court only.

RULES & REGULATIONS OF

B.Sc. MEDICAL TECHNOLOGY COURSES

(3 Years Degree Course)

DURATION OF COURSE:
The course shall be of 3 years duration from the date of commencement of academic session

MEDIUM OF INSTRUCTION
English shall be the medium of instruction.

OBJECTIVES:
At the end of the goal, the learner should be able to:

a) Perform medical and surgical procedural and technical skills essential to
b) Physician Assistant practice
c) Perform appropriate history and physical examinations.
d) Develop and Implement patient management plans
e) Understand the role of preventive medicine in healthcare including screening recommendations
f) Counsel and educate patients and their families while demonstrating compassion and respectful behaviors
g) Candidate admitted to this course will work during his / her training in hospitals, in outpatient, inpatient and hospital's all other departments. He / She have to attend theory classes as specified.

ELIGIBILITY FOR ADMISSION:

- For admission a candidate should have passed the 10+2 (Senior Secondary) Examination or its equivalent Examination Science stream i. e. Physics, Chemistry and Biology Subjects with 50% marks in the aggregate from any recognized Board.
- Candidate should have completed the minimum age of 17 years as on 31st December of the year of admission to B. Sc Ophthalmic Technology Course.

SELECTION OF CANDIDATES:
Selection for B. Sc Ophthalmic Technology Courses shall be done by an Admission Board strictly on merit judged on the basis of University Entrance Examination conducted in the month of July / August every year.

COMMENCEMENT OF THE COURSE
The Course shall commence from the 1st August of every Academic year.

RESERVATION:
Reservation of seats shall be applicable in accordance with Rajasthan State Government reservation policy.

ATTENDANCE:
75% in theory and 75% in practical/clinical in each year. Any one failing to achieve this, shall not be allowed to appear in the University examination.

ENROLMENT:
Every candidate who is admitted to B. Sc Ophthalmic Technology Courses in Mahatma Gandhi Medical College & Hospital shall be required to get himself/herself enrolled with the

Mahatma Gandhi University of Medical Sciences & Technology after paying the prescribed eligibility/enrolment fees.

The candidate shall have to submit the application form duly filled in and forwarded to the University through Principal of the College for the enrolment/eligibility along with the original documents with the prescribed fees (upto November 30 of the year of admission without late fees and upto December 31 of the year of admission with late fees)

SCHEME OF EXAMINATION

1. **Theory**
   (a) Each Theory paper examination shall be of 3 hours duration and of max marks 70.
   (b) Internal assessment shall be of 30 marks for Each Theory paper.
   (c) The number of question papers shall be in accordance with the different subjects/areas covered during each of the B.Sc. three years course. The number of question papers shall vary from course to course as per the subjects covered in different disciplines of the B. Sc Ophthalmic Technology Courses as under:

Name of Course		Theory			Paper Set & Evaluated by	
		Total Marks	Pass Marks	Papers	First and Second Year	Third (Final) Year
1	B.Sc. Radio Imaging Technology (RIT)	400	200	4 question papers for each year	4 Internal Paper Setters	3 Internals + 1 External paper setter
2	B.Sc. Medical Laboratory Technology (MLT)	300	150	3 question papers for each year	3 Internal Paper Setters	2 Internals + 1External paper setter
3	B.Sc. Clinical Dietetics (CD)	300	150			
4	B.Sc. Physician Assistance Technology (PAT)	200	100	2 question papers for each year	2 Internal Paper Setters	1 Internal + 1External paper setter
5	B.Sc. Operation Theater Technology (OTT)	200	100			
6	B.Sc. Ophthalmic Techniques and Optometry (OTO)	200	100			
7	B.Sc. Surgical Assistance (SA)	200	100			

   (d) For the First- and Second-year examinations – these respective above question papers (four, three or two as the case may be) shall be set by the Internal Examiners covering their respective areas of syllabus. For each question paper there shall be a separate Internal Examiner. The answer books shall be evaluated by the concerned Internal Examiners (Papers Setters).
   (e) In Third (Final) Year examination, one of the papers shall be set and evaluated by an External Examiner. In other words, one of the Internal has to be substituted by the External Examiner. The External Examiner (Paper Setter) shall evaluate his/her paper.
   (f) The Paper Setter shall set the questions within the prescribed course of study of the concerned paper. There will be a set pattern of question papers duly approved by Academic Council. Model question paper is annexed herewith.
   (g) It is to be noted that the Internal and External Examiners of all the three years (First, Second and Third year) shall be appointed by the President of the University. This exercise shall be conducted through the office of the Controller of the Examinations of the University. The External Examiner of Third year shall also be appointed by the President out of the panel of names submitted by the Concerned Coordinator of the course through the Dean to the Controller of Examinations for appointment of Examiners by the President of the University.

(h) Passing Marks: A candidate will have to obtain at least 50% marks in each Theory paper including internal assessment to pass. This means that he will have to score 50% marks in each paper. This shall include the marks obtained in Theory paper of 80 marks and internal assessment for that paper of 30 marks (Marks obtained in Theory paper + Marks obtained in internal assessment = the Total Marks obtained in respect of each paper).

2. **Practical and Viva-Voce Examination**

(a) Each year there shall be one practical and viva-voce examination. It shall be conducted after the Theory examination is over.

(b) The pattern of practical examination in different years of the course being not uniform shall vary in B. Sc Ophthalmic Technology degree course of different disciplines.

(c) The pattern shall be as follows –

<table>
<tr><th rowspan="2">S. No.</th><th rowspan="2">Name of Course</th><th colspan="2">Practical</th><th colspan="3">Practical Examiners</th></tr>
<tr><th>Total Marks</th><th>Pass Marks</th><th>First year</th><th>Second year</th><th>Third year</th></tr>
<tr><td>1</td><td>B.Sc. R.I.T.</td><td>400</td><td>200</td><td rowspan="3">3 Internal Examiners (+Expert(s) if needed)</td><td rowspan="3">4 Examiners (3 Internal+ 1 External)</td><td rowspan="3">4 Examiners (3 Internal+ 1 External)</td></tr>
<tr><td>2</td><td>B.Sc. M.L.T.</td><td>300</td><td>150</td></tr>
<tr><td>3</td><td>B.Sc. C.D.</td><td>300</td><td>150</td></tr>
<tr><td>4</td><td>B.Sc. P.A.T.</td><td>200</td><td>100</td><td rowspan="4">2 Internal Examiners (+Expert(s) if needed)</td><td rowspan="4">3 Examiners (2 Internal+ 1 External)</td><td rowspan="4">3 Examiners (2 Internal+ 1 External)</td></tr>
<tr><td>5</td><td>B.Sc. O.T.T.</td><td>200</td><td>100</td></tr>
<tr><td>6</td><td>B.Sc. O.T.O.</td><td>200</td><td>100</td></tr>
<tr><td>7</td><td>B.Sc. S.A.</td><td>200</td><td>100</td></tr>
</table>

(d) The experts: There shall be the provision for the experts where needed to be inducted as adviser(s) who shall only help the Internal Examiners to evaluate the students in adjunct areas of the course which do not warrant the appointment of separate examiners. It is to be noted that the experts shall not award any marks. The Coordinator of the course shall submit the name(s) of the expert(s) which shall be approved by the President.

(e) Total marks of the practical examination shall be equivalent to the total marks put together of the number of Theory papers in the B. Sc Ophthalmic Technology course.

(f) It shall be left to the examiners – Internals and the External, as the case may be, to examine and evaluate the students in practical in the way they wish and award the marks without giving any specific details. The total marks obtained by the candidate in the practical examination shall be the aggregate of the marks awarded by all the examiners put together as one figure. This shall then be submitted to the University. For example, in case of Radio Imaging Technology having four practical examiners, if a candidate scores 60 (first examiner), 50 (second examiner), 50 (third examiner) plus 60 (fourth examiner) – total 60+50+50+60 = 220 shall be submitted as one figure to the University. The award sheet shall be signed by all the practical examiners. The experts (where inducted) shall not sign the award sheet of the practical examination.

3. **Result:**

1. A candidate will have to obtain at least 50% marks separately in each Theory paper including internal assessment and a minimum of 50% marks in the practical examination for him to be declared pass.
2. A Candidate who has failed in theory paper/s will reappear in respective theory papers/s in supplementary examination.
3. Candidate who has failed in Practical examination only will reappear only in practical examination in Supplementary examination.

4. **Supplementary Examination:**

(a) Eligibility for the failed candidates to appear at the supplementary examination shall be as below –
   i. Failed in Theory Paper(s) and failed in Practical – shall reappear in the respective failed Theory paper(s) and Practical examination.
   ii. Failed in Theory paper/papers and passed in Practical examination – shall reappear only in the concerned failed Theory paper(s).
   iii. Passed Theory papers but failed in Practical – shall reappear only in the Practical Examination.

(b) There shall be a supplementary examination within two months of the declaration of the result of the main examination. Internal assessment marks obtained in main examination in the concerned failed paper/papers shall be carried forward for working out the result of supplementary Theory paper(s) examination. Such candidate who has secured less than 50% marks in the internal assessment will be allowed to improve his internal assessment marks in the repeat supplementary internal assessment examination.

(c) Marks secured by the candidate in passed main examination/supplementary examination Theory paper(s) and/or practicals, as the case may be, will be carried forward for working out his result.

(d) Result:
   i. A candidate obtaining at least 50% marks in the supplementary Theory paper(s) and 50% marks in the supplementary practical examination, as the case may be, shall be declared successful.
   ii. A candidate who has failed in supplementary theory paper(s) examination shall have to reappear only in the failed theory paper(s) at the subsequent examination.
   iii. A candidate who has failed in supplementary practical examination shall have to reappear both in theory (all papers) and practical at the next main examination.

5. **Promotion to Second/Third Year**

A candidate failed in theory paper(s) /Practical examination only shall be promoted to next year.

(b) A candidate will be allowed to appear for the Final (3^{rd}) year examination only when the backlog of all papers (theory and practical) of 1^{st} and 2^{nd} year Exams is cleared

(c) The student is required to complete the course within 6 years from the joining of the course

6**. Result** - Division: Successful candidates will be categorized as under-

1.	Those, securing 50% and above but less than 60% in the aggregate marks of First, Second & Third year taken together		Pass
2	Those, securing 60% and above but less than 75% in the aggregate marks of First, Second & Third year taken together		Pass with I Division
3	Those, securing 75% and above in the aggregate marks of First, Second & Third year taken together		Pass with Honors

PAPER SETTER/EXAMINER

1. All the examiners, paper setters, theory examination answer books evaluators, Internal and External Examiners for Practical examinations shall be appointed by the President of the University.
2. Qualification of the Paper setter / Examiner: Senior Demonstrator and above.
3. Paper setter can be an examiner

REVALUATION / SCRUTINY

Re-evaluation of answer book(s) of the B. Sc Ophthalmic Technology courses may be permissible in not more than 25% of the theory papers within 15 days from the date of declaration of examination result on submission of his/her application on the prescribed form alongwith the requisite fees. Such answer book(s) shall be re-evaluated as per university rules. Reevaluation of answer book(s) shall not be permitted for second attempt in any paper.

Scrutiny (re-totaling) of answer book(s) of the B. Sc Ophthalmic Technology courses may be permissible within 15 days from the date of declaration of examination result on submission of his/her application on the prescribed form alongwith the requisite fees as per University Rules.

GRACE MARKS

1. A student who appears in the whole examination in first attempt and obtains the required minimum pass marks in the total aggregate of an examination but fails to obtain the minimum pass marks in one subject (in theory and / or practical as the case may be) will be awarded the grace marks up to a maximum of 05 marks according to the following scale, provided the candidate passes the examination by award of such grace marks:

Marks obtained by the candidate above the required minimum aggregate pass marks		**Grace marks can be given up to**
Up to 6 marks	-	02
Up to 12 marks	-	03
Up to 18 marks	-	04
19 marks and above	-	05

2. No grace marks would be awarded to a candidate who appears in part/ supplementary/remand examination. Non-appearance of a candidate in any part of the examination on account of any reason will make him ineligible for grace marks.
3. A candidate who passes the examination after the award of grace marks in a paper/practical or the aggregate will be shown in the marks sheet to have passed the examination by grace. Grace marks will not be added to the marks obtained by a candidate from the examiners.
4. A candidate who is awarded grace marks in any subject to pass the examination will not be entitled for distinction in any subject.

Selection of Generic Elective and skills Enhancement Courses

Every student has to select any one elective subject out of seven elective subjects mentioned below at the beginning of the academic year during his/her course duration. The Examination of these subjects shall be conducted at the college level.

Sr. No.	Subject	Teaching hours		
		Theory	Practical	Total
1.	Disaster Management	45	15	60
2.	Information and Communication Technology in Health Education	45	15	60
3.	Clinical Nutrition	45	15	60
4.	Yoga	45	15	60
5.	Effective English	45	15	60
6.	Health Care	50	-	50
7.	Constitution of India	50	-	50

Distribution of Marks

S. No.	Subject	Theory	Internal Assessment	Total
1	Disaster Management	70	30	100
2	Information and Communication Technology in Health Education	70	30	100
3	Clinical Nutrition	70	30	100
4	Yoga	70	30	100
5	Effective English	70	30	100
6	Health Care	70	30	100
7	Constitution of India	70	30	100

A candidate can appear in the elective subject examinations to be conducted at the college level before the University examinations at the end of I year or II year or III year. Only such candidates shall be eligible to fill University examination form of III year (final year) who have passed their elective subject. It shall be mandatory to obtain 50% marks in the aggregate of prescribed total marks (i. e. 50 out of 100) to pass the elective subjects. Marks of all such candidates who have passed their elective subject shall be sent in the following format by the principal of the college to the University while sending their examination forms of III year (final year):

S. No.	University Roll No.	Name of the student	Father's Name	Name of elective subject	Marks obtained	Result

Those candidates who do not pass their elective subjects shall not be eligible to submit their III-year (final year) University examination form and accordingly they will not be permitted to appear in the University examination of III year (final year) of the course.

Marks obtained by the candidates in their elective subject shall be mentioned separately in the mark's sheets of the University examinations. These marks shall not be counted for preparing the merit list.

B.Sc. Ophthalmic Techniques and Optometry

Recommended Teaching Hours of Instruction for each subject

First Year B.Sc. Ophthalmic Techniques and Optometry Course

S. No.	Course Title	Hours
1.	Human Anatomy & Physiology, Ocular Anatomy, Ocular Pathology, Ocular Microbiology	100
2.	Ocular Physiology, Ocular Biochemistry, Physical and Physiological Optics	100
3.	Practical	200
	Total hours	**400**

Second Year B.Sc. Ophthalmic Techniques and Optometry Course

S. No.	Course Title	Hours
1.	Ocular Pharmacy and Pharmacology, Refraction	100
2.	Investigative ophthalmology Orthoptics, Ophthalmic Instruments and Appliances	100
3.	Practical	200
	Total hours	**400**

Third Year B.Sc. Ophthalmic Techniques and Optometry Course

S. No.	Course Title	Hours
1.	Clinical & Advanced Orthoptics, Clinical & Advanced Optics, Contact Lens, Clinical & Advanced Refractions	100
2.	Eye Bank, Community Ophthalmology, Investigations in Clinical Ophthalmology, Management of O T	100
3.	Practical	200
	Total hours	**400**

Total Hours- 400+400+400= 1200

Marks Distribution

First Year B.Sc. Ophthalmic Techniques and Optometry Course

Code No	Subject	Written			Practical		
		Theory	I.A. Theory	Total Theory	Practical + Oral	I.A. Practical	Total Practical
7291	Human Anatomy & Physiology, Ocular Anatomy, Ocular Pathology, Ocular Microbiology	70	30	100			
7292	Ocular Physiology, Ocular Biochemistry, Physical and Physiological Optics	70	30	100			
7293	Practical	-	-	-	140	60	200
	Total	**140**	**60**	**200**	**140**	**60**	**200**

Second Year B.Sc. Ophthalmic Techniques and Optometry Course

Code No	Subject	Written			Practical		
		Theory	I.A. Theory	Total Theory	Practical + Oral	I.A. Practical	Total Practical
7294	Ocular Pharmacy and Pharmacology, Refraction	70	30	100			
7295	Investigative ophthalmology Orthoptics, Ophthalmic Instruments and Appliances	70	30	100			
7296	Practical	-	-	-	140	60	200
	Total	**140**	**60**	**200**	**140**	**60**	**200**

Third Year B.Sc. Ophthalmic Techniques and Optometry

Code No	Subject	Written			Practical		
		Theory	I.A. Theory	Total Theory	Practical + Oral	I.A. Practical	Total Practical
7297	Clinical & Advanced Orthoptics, Clinical & Advanced Optics, Contact Lens, Clinical & Advanced Refractions	70	30	100			
7298	Eye Bank, Community Ophthalmology, Investigations in Clinical Ophthalmology, Management of O T	70	30	100			
7299	Practical	-	-	-	140	60	200
	Total	**140**	**60**	**200**	**140**	**60**	**200**

Total Marks- 400+400+400=1200

First Year B.Sc. Ophthalmic Techniques and Optometry

(1 Year Duration)

Paper-I

Human Anatomy & Physiology, Ocular Anatomy, Ocular Pathology, Ocular Microbiology

Theory Hours: 100
Total: 100

Human Anatomy & Physiology

1. Introduction of human body, cell and various tissue of the body
2. Embryology and development.
3. Skeletal system of Human body
4. Muscles of the body
5. Circulatory System
6. The Blood
7. The main arteries and veins of the body & Lymphatic system
8. Digestive system
9. The Liver
10. The Gall bladder, Pancreas & Spleen
11. Respiratory system
12. Endocrine Organs
13. Excretory System,
14. Reproductive system
15. Central Nervous System
16. Brain & Cranial Nerves
17. Spinal Cord and peripheral nerves
18. Autonomic nervous system
19. The Food, Vitamins & Protein
20. Organs of taste and smell

Ocular Anatomy

1. Embryology of the eye in general
2. Orbit and its immediate relations
3. Lids and eye lid glands
4. Conjunctiva, Cornea & Sclera
5. Iris and cilliary body
6. Lens and Vitreous
7. Retina & Choroid
8. Ocular Muscles
9. Visual Pathways
10. Sympathetic and parasympathetic's system
11. Visual Fields Vascular supply of eye
12. Lacrimal apparatus
13. Higher Visual Centres

Ocular Pathology

1. **Haematology**

a) Blood Cells and blood collection techniques
b) Haemoglobin estimation
c) Total leucocyte count
d) Differential leucocyte count
e) Erythrocyte sedimentation rate
f) Pheripheral blood film – staining, significance of a peripheral smear
g) Bleeding time, clotting time

2. **Clinical Pathology**
   a) Urine collection methods
   b) Physical Examination of Urine
   c) Chemical Examination of Urine
   d) Microscopic Examination of Urine

3. **Histopathology**
   a) Grossing of tissue
   b) Tissue processing
   c) Fixation of tissue
   d) Section cutting
   e) Staining – Hematoxylin & Cosin and Special Stains

4. **Ocular Microbiology**
   a) Introduction to Microbiology & classification.
   b) Gram Positive Bacteria
   c) Gram Negative Bacteria
   d) Fungi -sephorophytics and pathogenic
   e) Virus
   f) Aseptic techniques
   g) Chlayadia & parasites.

Paper–II

Ocular Physiology, Ocular Biochemistry, Physical and Physiological Optics

Theory Hours: 100
Total: 100

Ocular Physiology

1. General physiology of the eye - An introduction
2. Maintenance of Transparency of the Cornea
3. Maintenance of Transparency of the Lens
4. Visual acuity and form sense
5. Pupillary reflexes
6. Accommodation
7. Convergence
8. Intra Ocular Pressure
9. Night Vision
10. Colour Vision
11. Visual Fields
12. Extrinsic Muscles, Actions and Ocular Movements
13. Higher Visual Centres and righting reflexes
14. Electrophysiological Aspects
15. Conjugate and Disguate -Movements of the eye

Ocular Biochemistry

1. Introduction to various biochemical test
2. Tears film and pH
3. General Introduction to metabolic processes affecting the eye
4. Rhodopsin cycle
5. Aqueous and Vitreous humours
6. Metabolism of lens and cornea.

Physical and Physiological Optics

1. Elementary basis of light- Interference, diffraction, polarization spectrum, surface tension,viscosity
2. Principles of Refraction.
3. Physical Optics -1, Lens Shapes -Convex, Concave
4. Physical Optics -2, Thin Lens equation, thick lens equation
5. Physical Optics -3, Front and back vertex power
6. Physical Optics -4. Aberrations
7. Physical Optics -5. Spherical, Cylindrical & Toric surfaces, Aspheric surfaces
8. Prisms -definition, uses, nomenclature, apex
9. Determination of focal length & diopteric power of lens
10. Strum's Conoid
11. Neutralization of lenses
12. Focimeter
13. Centre & Axis Marking by focimeter
14. Simple & Toric transposition
15. Prismatic effect & Decentration
16. Aberrations & Tints in spectacle Lenses
17. Spectacle Lens Manufacturing -Sphericals, Toric, Bifocals, Lenticular & Lab Visit

18. Spectacle Frames -History, Nomenclature, Types & parts, sides, joints, frame bridge.
19. Shape of Spectacle Frame -Measurements & Making, Frame & Face Measurements
20. Schematic eye
21. Emmetropia & Ammetropia -Aetiology, Population, Distribution,Growth of eye,
22. Myopia
23. Hypermetropia
24. Astigmatism
25. Aphakia/Pseudo-phakia
26. Presbyopia
27. Keratoconus
28. Post-Op. Refractive errors
29. Refraction of irregular reflex
30. Accommodation & Convergence -1, Far point, near point, range, amplitude of accommodation
31. Accommodation & Convergence -2. Methods of measurements, NPA. AC/A ratio.
32. Retinoscopy -Principle & Methods
33. Objective Refraction
34. Subjective Refraction
35. Cross Cylinder
36. Workshop
37. Manufacturing Spectacle Lens
38. Plastic Lenses -Manufacturing & Characteristic
39. Lens Designs -Ashperic
40. High Index Lenses,
41. Photocromatic Lenses
42. Tinted Lenses
43. Polaroid Lenses
44. Bifocals
45. Measurement for ordering spectacle, IPD, Marking centration.V. D. Calculation.
46. Fitting Bifocals, Multifocals, Prism Lenses
47. Fitting Lenses in Frames
48. Glazing & Edging
49. Final Checking & Adjustments to prescriptions
50. Patient complains, handling correction.
51. Repair of spectacles
52. Special types of spectacles monocells/ptosis hemianopic glasses
53. Test chart standards
54. Phoropter
55. Objective Optometer
56. Projection Charts
57. Refraction room Standards

Practical

Practical Hours: 200
Total: 200

Paper I & II
Human Anatomy & Physiology, Ocular Anatomy, Ocular Pathology, Ocular Microbiology, Physiology, Ocular Biochemistry, Physical and Physiological Optics

Human Anatomy & Physiology

1. Introduction of human body, cell and various tissue of the body
2. Embryology and development.
3. Skeletal system of Human body
4. Muscles of the body
5. Circulatory System
6. The Blood
7. The main arteries and veins of the body & Lymphatic system
8. Digestive system
9. The Liver
10. The Gall bladder, Pancreas & Spleen
11. Respiratory system
12. Endocrine Organs
13. Excretory System,
14. Reproductive system
15. Central Nervous System
16. Brain & Cranial Nerves
17. Spinal Cord and peripheral nerves
18. Autonomic nervous system
19. The Food, Vitamins & Protein
20. Organs of taste and smell

Ocular Pathology

1. Sampling and Collection of Blood: intro-venous and peripheral
2. Estimation of haemoglobin
3. Peripheral Blood Film Staining
4. Identification of normal white blood cells
5. Erythrocyte sedimentation rate
6. Urine chemical examination – Sugar and Protein
7. Hematoxylin and Cosin Staining

Ocular Microbiology

1. Introduction to Microbiology: Culture media, Classification, Morphological, Lab. diagnosis ofinfection
2. Collection of samples
3. Serology
4. Culture media for bacteria, fungi and viruses
5. Oxidase test
6. Mantoux test
7. Staining procedures: Gram Staining
8. Staining procedures: Romanowsky stains

9. Staining procedures: Ziehl Neelsen's staining

Orthoptics

1. Latent squint work-up
2. Synptophore
3. Maddox wing
4. Maddox rods
5. Prism bar
6. Near point of accommodation
7. Near point of convergence
8. Fusion exercises

Ocular Bio-Chemstry

1. Sampling and Collection of Blood
2. Biochemical tests, including blood sugar estimation
3. Ketone bodies in urine
4. Spectrophotometry
5. Serum-cholesterol

OPTICS

1. Workshop
2. Manufacturing Spectacle Lens
3. Manufacturing Bifocal Lenses
4. Measurement for ordering spectacle, IPD, Marking centration, V. D. Calculation.
5. Fitting Bifocals, Multifocals, Prism Lenses
6. Fitting Lenses in Frames
7. Glazing & Edging
8. Final Checking, Adjustments to prescriptions
9. Patient complains, handling correction.
10. Repair of spectacles
11. Special types of spectacles monocells/ptosis hemianopic glasses
12. Neutralization of lenses
13. Focimeter
14. Shape of Spectacle Frame -Measurements & Making, Frame & Face Measurements
15. Refraction under the supervision

Second Year B.Sc. Ophthalmic techniques and optometry

(1 year duration)

Paper –I

Ocular Pharmacy and Pharmacology, Refraction

Theory Hours: 100
Total: 100

Ocular Pharmacy and Pharmacology

1. Ocular Pharmacology – An introduction
2. Autonomic nervous system
3. Routes of drug administration
4. Miotics, Mydriatics & Cycloplegics drugs
5. Antibacterial drugs & therapy
6. Antifungal drugs & therapy
7. Anti-Viral drugs & therapy
8. Antibacterial drugs & therapy
9. Anti-inflammatory drugs & therapy
10. Anti-glaucoma drugs & therapy
11. Ophthalmic dyes
12. Local Anaesthetics
13. Ophthalmic preservatives
14. Ocular lubricants
15. Ocular irrigating solutions
16. Ocular antiseptics & disinfectants
17. Anti-cataract agents
18. Contact lens solution
19. Chelating agents
20. Immunosuppressive agents

Refraction

1. Emmetropia & Ammetropia -Aetiology, Population, Distribution, Growth of eye.
2. Myopia
3. Hypermetropia
4. Astigmatism
5. Aphakia/Pseudo-phakia
6. Presbiopia
7. Keratoconus
8. Post-Op. Refractive errors
9. Refraction of irregular reflex
10. Accommodation & Convergence –1. Far point, near point, ranges. Amplitude of accommodation
11. Accommodation & Convergence – 2. Methods of measurements, NPA. AC/A ratio.
12. Retinoscopy -Principle & Method
13. Objective Refraction
14. Subjective Refraction
15. Cross Cylinder

Paper–II
Investigative ophthalmology Orthoptics, Ophthalmic Instruments and Appliances

Theory Hours: 100
Total: 100

Investigative Ophthalmology

Orthoptics

1. Orthoptics-General Concept
2. Ocular muscles and movements
3. AC/ A ratio
4. Measurements of angle of squint
5. Latent squint
6. Maddox rod
7. Maddox wing
8. Synoptophore
9. Manifest concomitant
10. Squint concomitant
11. Paralytic Squint
12. Head posture and its significance
13. Hess Screening and its Interpretations
14. Pleoptics
15. Occlusion -types and uses
16. Nystagmus
17. A. V. Syndromes
18. Testing of ARC
19. Amblyopia
20. Disorders of accommodation
21. Paediatric visual acuity assessment
22. Paediatric Refraction
23. Neural aspects of binocular vision

Ophthalmic Instruments and Appliances

1. Indirect Ophthalmoscope
2. Direct Ophthalmoscope
3. Slit Lamp: Haag-Streit.
4. Photo-slit lamp
5. Lensometer. Lens gauge
6. Tonometer
7. Fundus Camera
8. External eye photography
9. Auto-refractometer
10. Corneal Examination -1. Placido disc
11. Corneal Examination -2. Keterometer
12. Corneal Examination -3. V KG
13. Corneal Examination -4. Specular Microscopy
14. Corneal Examination -5. Aesthesiometer
15. Exophthalmometer
16. Perimeter – Manual & automated
17. Orthoptics Instruments -Haploscope/Home devices

18. Heidelberg Retino-tomography HRT -II
19. Nerve fiber analyzer
20. Frequency doubling perimeter
21. Non Contact Tonometer
22. Heidelberg Analmascope
23. Pachometers
24. Contrast sensitivity tests
25. Glare acuity tests
26. Colour vision tests
27. Dark adaptometer

Practical

Practical Hours: 200
Total: 200

Paper I & II
Ocular Pharmacy and Pharmacology, Refraction, Investigative ophthalmology Orthoptics, Ophthalmic Instruments and Appliances

Ocular Pharmacy and Pharmacology

1. Quality Control:
    a. Sterilization
    b. PH measurement
    c. Osmolarity
    d. Spectrophotometry for concentration
2. How to prepare following eye drops:
    a. Pilo-clonidine eye drops
    b. Artificial eye drops
    c. Glycerin eye drops
    d. Homatropine eye drops
    e. EDTA eye drops
    f. Sulphacetamide eye drops
    g. Dexamethasone eye drops
    h. Methylecellulose eye drops
    i. Saline eye drops
    j. Sodium citrate eye drops
3. MK Media preparation
4. Fluorescein Strip, Rose Bengal Strips preparation
5. Autologous serum eye drops preparation
6. Dilution of drug in different concentration
7. Steroid detection test

Refraction

1. Refraction and prescription of glasses in OPD

Investigative Ophthalmology

1. Manifest squint work-up
2. Paralytic squint work-up
3. Pleoptics
4. Orthoptic Exercises

Ophthalmic Instruments and Appliances

1. Lensometer, Lens gauge
2. Tonometer
3. Placido disc
4. Keterometer
5. VKG
6. Specular Microscopy
7. Exophthalmometer
8. Perimeter

9. Non Contact Tonometer
10. Slit Lamp: Haag-Streit.
11. Photo-slit lamp
12. Fundus Camera
13. Contrast sensitivity tests
14. Glare acuity tests
15. Colour vision tests
16. Dark adaptometer

Third Year B.Sc. Ophthalmic techniques and optometry

(1 year duration)

Paper –I

Clinical & Advanced Orthoptics, Clinical & Advanced Optics, Contact Lens, Clinical & Advanced Refractions

Theory Hours: 100
Total: 100

Clinical & Advanced Orthoptics

1. Orthoptic-General concept
2. Ocular muscles and movements
3. AC/ A ratio.
4. Measurements of angle of squint
5. Latent squint
6. Maddox rod
7. Maddox wing
8. Synoptophore
9. Manifest concomitant
10. Squint concomitant
11. Paralytic Squint
12. Head posture and its significance
13. Hess Screening and its Interpretations
14. Pleoptics
15. Occlusion -types and uses
16. Nystagmus
17. A. V. Syndromes
18. Testing of ARC
19. Amblyopia
20. Disorders of accommodation
21. Paediatric visual acuity assessment
22. Paediatric Refraction
23. Neural aspects of binocular vision

Clinical & Advanced Optics

1. Emmetropia & Ammetropia –Aetiology, Population. Distribution, Growth of eye.
2. Myopia
3. Hypermetropia
4. Astigmatism
5. Aphakia/Pseudo-phakia
6. Presbiopia
7. Keratoconus
8. Post-Op. Refractive errors
9. Refraction of irregular re/ex
10. Accommodation & Convergence -1. Far point, near point, range, amplitude of accommodation
11. Accommodation & Convergence -2. Methods of measurements. NPA. AC I A ratio.
12. Retinoscopy -Principle & Methods
13. Objective Refraction
14. Subjective Refraction

15. Cross Cylinder

Contact Lens

1. History of Contact Lens
2. Corneal Anatomy and Physiology
3. Corneal Physiology and Contact Lens
4. Preliminary Measurements and Investigations
5. Slit Lamp Biomicroscopy
6. Contact Lens materials
7. Optics of the Contact Lens
8. Glossary of Terms: Contact Lenses
9. Indications and Contra Indications Contact Lens
10. Rigid gas permeable contact lens design
11. Soft Contact lens design & manufacture
12. Kertometery, Placido's disc, Tonography
13. Fitting philosophies
14. Fitting of Spherical SCL and effect of parameter changes
15. Astigmatism correction options
16. Fitting Spherical RGP contact Lenses, Low OK, High OK
17. Effects of RGP contact Lens parameter changes on lens fitting
18. Fitting in Astigmatism (Sph RGP)
19. Follow-up post fitting examination
20. Follow-up Slit Lamp examination
21. Fitting in Keratoconus
22. Fitting in Aphakia, Pseudophakia
23. Cosmetic Contact Lenses
24. Fitting Contact Lens in children
25. Toric Contact Lenses
26. Bifocal Contact Lenses
27. Continuous wear and extended wear lenses
28. Therapeutic Lenses/Bandage lenses
29. Contact lens following ocular surgeries
30. Disposable contact lenses, frequent replacement and Lenses
31. Use of Specular Microscopy and Pachymetry in Contact Lenses
32. Care & maintenance of Contact Lenses
33. Contact Lens modification of finished lenses
34. Instrumentation in contact lens practise
35. Checking finished lenses parameters
36. Recent developments in Contact lenses
37. Review of lenses available in India

Clinical & Advanced Refractions

1. Emmetropia & Ammetropia -Aetiology, Population, Distribution, Growth of eye.
2. Myopia
3. Hypermetropia
4. Astigmatism
5. Aphakia/Pseudo-phakia
6. Presbyopia
7. Keratoconus
8. Post-Op. Refractive errors

9. Refraction of irregular reflex
10. Accommodation & Convergence -1. Far point, near point, range, amplitude of accommodation
11. Accommodation & Convergence -2. Methods of measurements, NPA, AC/ A ratio.
12. Retinoscopy -Principle & Method
13. Objective Refraction
14. Subjective Refraction
15. Cross Cylinder
16. Low- Vision aids: Techniques & microscopes
17. Rehabilitation of blinds

Paper–II

Eye Bank, Community Ophthalmology, Investigations in Clinical Ophthalmology, Management of O T

Theory Hours: 100

Total: 100

Eye Bank

1. Publicity
2. How to donate your eyes
3. Collection of eyes
4. Preservation of eyes
5. Pre-operative Instructions
6. Post-operative Instructions
7. Latest techniques for preservation of donor Cornea

Community Ophthalmology

1. Concepts of community Ophthalmology - I
2. Concepts of community Ophthalmology - II
3. The Epidemiology of Blindness (General Principles) - I
4. The Epidemiology of Blindness (General Principles) - II
5. The Epidemiology of Blindness (Disease specific strategies) - III
6. The Epidemiology of Blindness (Disease specific strategies) - IV
7. Survey Methodological - I
8. Survey Methodological - II
9. Survey Methodological - III
10. Screening procedures in Ophthalmology – I
11. Screening procedures in Ophthalmology – II
12. School eye screening programme
13. Primary eye care
14. Organization of Out reach services
15. Organization of Reach-in-Programme
16. Information, Education, communication
17. Rehabilitation of the visually handicapped
18. National programme for control of Blindness – I
19. National programme for control of Blindness – II
20. Vision 2020: The Right to sight

Investigations in Clinical Ophthalmology

1. Principle, Techniques and preparation of the patient
2. ERG
3. EOG
4. Electro-Oculomyo-gram
5. Ultra-sono-graphy
6. Tonography
7. Berman’s Locator/Foreign body locator
8. Fluorescein Angiography
9. Ocular Photography -anterior segment
10. Dark Adaptometry: Adaptation & Adaptometry
11. Syringing & Lacrimal function Test
12. Gonioscopy

13. Pachometry
14. Perimetry
15. Laser therapy
16. Contrast Sensitivity
17. Slit Lamp
18. VKG
19. Specular Microscopy
20. Fundus Photography
21. Colour Vision Investigations – Ishhara Charts, E-G Lantern, Negal's anomaloscope, 100 HueTest
22. A -Scan Biometry
23. Heidelberg Retina-tomography HRT –II
24. Nerve fiber analyzer
25. Frequency doubling perimeter
26. Non Contact Tonometry
27. UBM
28. OCT

Management of O T

1. Introduction to Ocular in general.
2. Asepsis: How to achieve
3. Aanesthetic agents and where indicated
4. 0 T Sterilization procedures
5. Sterilization procedures of 0 T Instruments
6. Maintenance of Instruments and equipments: Ophthalmic Instruments
7. Maintenance of Instruments and equipments: Orthoptics Instruments
8. Maintenance of Instruments and equipments: Surgical Instruments
9. Maintenance of Instruments and equipments: Optometric & Contact Lens Equipment

Practical

Practical Hours: 200
Total: 200

Paper - I
Clinical & Advanced Orthoptics, Clinical & Advanced Optics, Contact Lens, Clinical & Advanced Refractions

Paper - II
Eye Bank, Community Ophthalmology, Investigations in Clinical Ophthalmology, Management of O T

Clinical & Advanced Orthoptics
1. Manifest squint work-up
2. Paralytic squint work-up
3. Pleoptics
4. Orthoptic Exercises

Clinical & Advanced Optics
1. Refraction and prescription of glasses in independent cabin

Contact Lens
1. Contact Lens fitting
2. Counselling to Contact Lens patient
3. Post-fitting instructions
4. Remedy of post-fitting problems

Clinical & Advanced Refractions
1. Refraction and prescription of glasses

5. EYE BANK
1. How to donate your eyes/Counselling
2. Collection of eyes
3. Preservation of eyes

Community Ophthalmology
1. Eye Screening Programme & Surveys
2. Eye camp (approx. 3) of 10 days each
3. PHC posting

Investigations in Clinical Ophthalmology
1. Fluorescein Angiography
2. Syringing & Lacrimal function Test
3. Slit Lamp
4. VKG
5. Specular Microscopy
6. NCT
7. Applanation and schiotz tonometry
8. Dark Adaptometry

9. A -Scan Biometry
10. Contrast Sensitivity
11. Perimetry
12. Keratometry
13. Focimetry
14. ERG/EOG/VER

SEMINARS: All students have to attend Seminars

To be Presented by First Year

1. **Optics**
   a. Frames & Spectacle Lens Materials
   b. Quality control methods of Spectacle Lens
   c. Application of focimeter and Genva lens measure in Optical dispensing.
2. **Refraction**
   a. Visual acuity methods
   b. Principles and application of Retinoscopy
   c. Explanation of various types of refractive error
3. **Advanced Refraction**
   a. Comparison between Static and Dynamic Retinoscopy
   b. Subjective Methods of Refraction
   c. Objective Methods of Refraction

To be Presented by Second Year

1. **Anterior Segments**
   a. Introduction of eye disorders
   b. Physiology & Investigations for corneal disorders
   c. Physiology & Investigations for lenticular disorders
2. **Posterior Segments**
   a. Anatomy and physiology of retina & optic nerve
   b. Principles of direct & indirect Ophthalmoscopy
   c. Principles of FA & Laser therapy
3. **Tonometry**
   a. Principles & comparison of various types of tonometry
   b. Standardization of various types of tonometers
   c. Special methods in tonometry
4. **Perimetry**
   a. Theoretical Comparison between Static & Kinetic Perimetry
   b. Static & Kinetic Perimetry -practical view
   c. Standardization of perimeters and the factors affecting its reliability.

To be Presented by Third Year

1. **Orthoptics**
   a. Diagnosis of latent and manifest squint
   b. Paralytic squint investigations
   c. Amblyopic and pleoptics treatment
2. **Posterior Segments**
   a. Normal & pathological fundus
   b. Fundus Camera & application of FA.

c. Lasers and its uses in Ophthalmology

3. **Cornea and Refractive Surgery**
   a. Clinical investigations of pre-refractive Surgery
   b. Clinical investigations of post-refractive Surgery
   c. Clinical analysis of refractive Surgery
4. **Advanced Refraction and Contact Lenses**
   a. Low vision aids for poor vision patients
   b. Materials and manufacturing techniques of contact lenses
   c. Indications & Contra-indications for Contact Lenses
5. **Advanced Contact Lenses**
   a. Fitting philosophies of contact lenses
   b. Post fitting problems of contact lenses and its remedy
   c. Toric/Bifocal Contact lenses
6. **Perimetry in Ocular disorders**
   a. Visual fields defects in Glaucoma
   b. Visual fields defects in retinal & neurological disorders
   c. Latest development in perimetry

MODEL PAPER

B.Sc. OTO-I **HA&PCAOP&CM-I**
7291

B.Sc. Ophthalmic Techniques and Optometry
Part-I (Main) Examination Month Year

Paper I
Human Anatomy & Physiology, Ocular Anatomy,
Ocular Pathology & Ocular Microbiology

Time: 3 hours
Maximum Marks -70

All the parts of one question should be answered at one place in sequential order
Student shall be allowed to take only one supplementary copy along with one main answer book.

Q.1 Write short notes on any three 3x5 = 15
a) Orbital Staining
b) Erythrocyte Sedimentation Rate
c) Fixation tissue
d) Gram Negative Bacteria

Q.2 Write short notes on any three 3x5= 15
a) Bleeding time, clotting time
b) Hematoxylin & eosin stains
c) Total leucocyte count
d) Conjunctiva

Q.3 Describe types of Conjunctivitis 10

Q.4 Describe vascular supply of eye 10

Q.5 Describe lacrimal apparatus 10

Q.6 Describe structure of human lens 10

MODEL PAPER

B.Sc. OTO-I **Ocu. Physio. Biochem. Physi. Opti.-II**
7292

B.Sc. Ophthalmic Techniques and Optometry
Part-I (Main) Examination Month Year

Paper-II
Ocular Physiology, Ocular Biochemistry, Physical and Physiological Optics

Time: 3 hours
Maximum marks -70

All the parts of one question should be answered at one place in sequential order
Student shall be allowed to take only one supplementary copy along with one main answer book.

Q.1 Write short notes on any three 3x5 = 15
a) Night Vision
b) Colour Vision
c) Accommodation
d) Intra Ocular Pressure

Q.2 Write short notes on any three 3x5 = 15
a) Aqueous & Vitreous
b) Metabolism of lens
c) Metabolism of cornea
d) Visual Fields

Q.3 Describe various pupillary reflexes 10

Q.4 Describe types of visual acuity 10

Q.5 Describe types of myopia 10

Q.6 Describe astigmatism & methods of correction 10

MODEL PAPER

B.Sc. OTO-II **Ocu. Pharma. Refra.-I**
7294

B.Sc. Ophthalmic Techniques and Optometry
Part-II (Main) Examination Month Year

Paper-I
Ocular Pharmacy and Pharmacology, Refraction

Time: 3 hours
Maximum marks 70

All the parts of one question should be answered at one place in sequential order
Student shall be allowed to take only one supplementary copy along with one main answer book.

Q.1 Write short notes on any three 3x5 = 15
a) Ophthalmic Dyes
b) Local Anaesthetics
c) Contact Lens Solution
d) Hypermetropia

Q.2 Write short notes on any three 3X5= 15
a) Chelating Agents
b) Post-Op. Refractive errors
c) Accommodation & Convergence-far point, near point, ranges. Amplitude of accommodation
d) Subjective Refraction

Q.3 Describe various antifungal drugs & therapy 10

Q.4 Describe various Ophthalmic preservatives 10

Q.5 Describe Emmetropia & Ammetropia - Aetiology, Population, Distribution, Growth of eye 10

Q.6 Describe Principle & Method of Retinoscopy 10

MODEL PAPER

B.Sc. OTO-II **Invest. Ophthal. Ortho. Ophthal. Instru. Appli. -II**

7295

B.Sc. Ophthalmic Techniques and Optometry
Part-II (Main) Examination Month Year

Paper-II

Investigative Ophthalmology Orthoptics, Ophthalmic Instruments and Appliances

Time: 3 hours
Maximum marks 70

All the parts of one question should be answered at one place in sequential order
Student shall be allowed to take only one supplementary copy along with one main answer book.

Q.1 Write short notes on any three 3x5 = 15
a) Ac/ A ratio
b) Maddox road
c) Maddox wing
d) Indirect Ophthalmoscope

Q.2 Write short notes on any three 3x5= 15
a) Tonometer
b) Fundus camera
c) Exophthalmometer
d) Nerve fiber analyzer

Q.3 Describe Paralytic Squint 10

Q.4 Describe types of occlusions and uses 10

Q.5 Describe amblyopia & therapy 10

Q.6 Describe various types of colour vision tests 10

MODEL PAPER

B.Sc. OTO-III **Clini. Adv. Ortho. Cli. Adv. Opt. Cont. Clini. Adv. Refra.-I**

7297

B.Sc. Ophthalmic Techniques and Optometry
Part-III (Main) Examination Month Year

Paper-I

Clinical & Advanced Orthoptics, Clinical & Advanced Optics, Contact Lens, Clinical & Advanced Refractions

Time: 3 hours
Maximum marks 70

All the parts of one question should be answered at one place in sequential order
Student shall be allowed to take only one supplementary copy along with one main answer book.

Q.1 Write short notes on any three 3x5 = 15
a) Latent squint
b) Maddox wing
c) Testing of ARC
d) Keratoconus

Q.2 Write short notes on any three 3x5 = 15
a) Optics of the contact lens
b) Rigid gas permeable contact lens design
c) Cosmetic contact lenses
d) Toric contact lenses

Q.3 Describe various ocular muscles and movements 10

Q.4 Describe types of occlusions and uses 10

Q.5 Describe various contact lens material 10

Q.6 Describe various techniques & microscopes use for low vision aids 10

MODEL PAPER

B.Sc. OTO-III Eye Bank. Comm. Ophthal. Invest. Clini. Ophthal. Mgmt OT. -II
7298

B.Sc. Ophthalmic Techniques and Optometry
Part-III (Main) Examination Month Year

Paper-II

Eye Bank, Community Ophthalmology, Investigations in Clinical Ophthalmology & Management of O.T.

Time: 3 hours
Maximum marks 70

All the parts of one question should be answered at one place in sequential order
Student shall be allowed to take only one supplementary copy along with one main answer book.

Q.1 Write short notes on any three 3x5 = 15
a) ERG
b) Ultra-sono-graphy
c) Tonography
d) Fluorescein angiography

Q.2 Write short notes on any three 3x5 =15
a) Perimetry
b) Contrast sensitivity
c) Specular Microscopy
d) UBM

Q.3 Describe various methods for Preservation of eyes 10

Q.4 Describe Primary eye care 10

Q.5 Describe Rehabilitation of the visually handicapped 10

Q.6 Describe maintenance of Ophthalmic instruments and equipments 10

Elective Paper- Non – University Examination
DISASTER MANAGEMENT

Theory Hours: 45
Practical Hours: 15
Total Hours: 60

Introduction to Disasters

a. Concepts, and definitions (Disaster, Hazard, Vulnerability, Resilience, Risks)
b. Disasters
c. Classification Causes, Impacts (including social, economic, political, environmental, health, psychosocial, etc.)
d. Differential impacts- in terms of caste, class, gender, age, location, disability Global trends in disasters. urban disasters, pandemics, complex emergencies, Climate Change

Approaches to Disaster Risk reduction

a. Disaster cycle - its analysis, Phases, Culture of safety, prevention, mitigation and preparedness community based DRR, Structural- non structural ensures, roles and responsibilities of- community, Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), states, Centre, and other stake- holders.

Inter-relationship between Disasters and Development

a. Factors affecting Vulnerabilities, differential impacts, impact of Development projects such as dams, embankments, changes in Land-use etc. Climate Change Adaptation. Relevance of indigenous knowledge, appropriate technology and local resources

Disaster Risk Management in India

a. Hazard and Vulnerability profile of India Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management institutional
Arrangements (Mitigation, Response and Preparedness, DM Act and Policy, Other related policies, plans, programmes and legislation).

Project Work: (Field Work, Case Studies)

a. The project /fieldwork is meant for students to understand vulnerabilities and to work on reducing disaster risks and to build a culture of safety. Projects must be conceived creatively based on the geographic location and hazard profile of the region where the college is located

Suggested Reading list:

- Alexander David, Introduction in 'Confronting Catastrophe', Oxford University Press, 2000
- Andharia J. Vulnerability in Disaster Discourse, JTCDM, Tata Institute of Social Sciences Working Paper no. 8, 2008
- Blaikie, P, Cannon T, Davis I, Wisner B 1997. At Risk Natural Hazards, Peoples' Vulnerability and Disasters, Routledge.
- Coppola P Damon, 2007. Introduction to International Disaster Management,
- Cuny, F. 1983. Development and Disasters, Oxford University Press.

INFORMATION AND COMMUNICATION TECHNOLOGY IN HEALTH EDUCATION

Theory Hours: 45
Practical Hours: 15
Total Hours: 60

Learning objectives
Upon successful completion of this subject, students should

1. To obtain the basic knowledge on computer, devices used in computers.
2. To know the uses of computers like MS office, Power point Presentations, Excel documents.
3. To know about uses of internet, its advantages in regular updating the knowledge in Occupational therapy profession.

SYLLABUS

Introduction

1. Introduction to computers-History of Computer, Generation of Computer, Classification of Computers, Input Devices, Output Devices, Central Processing Unit, Components of CPU, Memory Unit, Peripheral Devices
2. Introduction to M.S. Windows
3. Internet and its applications
4. MGUMST web forum & portal
5. Google Applications
6. Introduction to M.S. Office - Word, Power Point, Excel,
7. Publisher

The Digital Age
Computer and communications, the five operations of a computer-and communication system- input, processing, output, storage and communications as well as the corresponding categories of hardware, five major categories of computers, development I communication Technology.

Applications Software

Applications and systems software, ethics of copying software, four types of applications software, entertainment education and reference, productivity and business and specialized, key functions of word processors, spreadsheets, database managers, graphics programs and suites, group-ware, and internet web browsers.

Storage Devices
Units of storage capacity, primary and secondary storage, data compression, data storage on diskette, hard disks, optical disks, and magnetic tape and describe the purposes of storage media.

Communications
Usage of communications technology, telephone-related services, online information services, the internet

Multimedia

What is multimedia – Multimedia PC– Multimedia Hardware - Central processor – color display, Multimedia accessories – CD ROM – Digital Audio – Audio speakers
– Digital video– MIDI – deodisc Read/write storage device- Multimedia software

Radio propagation:

Use of computers in physical therapy – Application Packages used in statistical analysis.

Recommended books

1. Free T. Hotstetter, ―Multimedia Literacy‖ M<egraw Hill,
2. Simon J. Gibbs, Dinoysios C. Tsichritziz, ―Multimedia programming‖, Addison Wesley
3. John F.Koefgel Buford, ―Multimedia Systems‖, Addison Wesley
4. John Vince, ―Virtual Reality Systems‖ Addison Wesley.
5. AndressF.Molisch, ―Wideband Wireless digital communication‖ Pear Education Asia

CLINICAL NUTRITION

Theory Hours: 45
Practical Hours: 15
Total Hours: 60

COURSE OBJECTIVE:

The objective of this course is that after 30 hours of L, D, P the student shall be able to understand the basic knowledge about Diet, balanced diet, metabolism, malnutrition, under nutrition, over nutrition, deficiency disease.

COURSE OUTCOME:

1. Become familiar about the nutritive values of food.
2. Explain about the food sources from which we obtain vitamins.
3. Become familiar with various compositions of food.
4. Well versed with digestion at each stages of digestive system.
5. Become familiar with different cooking methodologies.
6. Know and explain about food preparations by food manufacturer.
7. Explain thoroughly about the advantages and disadvantages of various convenience foods.

UNIT ISOURCES OF FOOD

1. Nutritive value of foods,
2. Food Sources from which key vitamins are derived

UNIT II DIGESTIVE SYSTEM

1. Digestion and absorption –Digestion at each stage of the digestive system
2. Dietary guidelines- Factors affecting food requirements. Planning and serving of family meals. Meals for all ages and occupations.

UNIT III COMPOSITION OF FOOD

Composition and value of the main foods in the diet - Milk, meat, fish, cheese, eggs, margarine and butter cereals (wheat, rice, maize, millets, oats) fruits and vegetables

UNIT IV PROCESSING OF FOOD

1. Cooking of food -Transfer of heat by conduction, convection and radiation.
2. Principles involved in the different methods of cooking – boiling, stewing, grilling, baking, roasting, frying, steaming, pressure cooking, cooking in a microwave oven.

FOOD PREPARATION

1. Convenience foods- Foods partly or totally prepared by a food manufacturer – dehydrated, tinned, frozen, ready to eat. Intelligent use of these foods.
2. Advantages and disadvantages

Text Book:

1. Agarwal, Textbook of human nutrition, JP, 1 Ed, 2014

Reference:

1. Kenneth F. Kiple, KriemhildConeè Ornelas, The Cambridge world history of food, Cambridge University Press,Ist ed,2000

YOGA

Theory Hours: 45
Practical Hours: 15
Total Hours: 60

COURSE OBJECTIVE:

The objective of this course is that after 30 hours of lectures & demonstrations, the student will be able to understand the basic concepts about Asanas and its effects, therapeutics effects of Yoga

COURSE OUTCOME:

1. Demonstrate the introduction and principles of yoga.
2. Knowledge of history of yoga and yoga in modern India.
3. Outline of yoga background and importance of yoga in modern world.
4. Learning the types and forms of Asanas and description of physiological effect of yoga.
5. Understanding the role of yoga in Occupational Therapy

UNIT-I Introduction to Yoga

1. Introduction to Yoga
2. Principles of Yoga

UNIT- II Patanjali

1. History of Yoga
2. Yoga in Ancient and Modern India

UNIT- III Folds of Yoga

1. Types & Forms of Yoga
2. Asanas & its physiological effects

UNIT- IV Yogic Science

1. Scientific background of Yoga
2. Yoga in modern world

UNIT -V Advantages of Yoga

1. Physiological Effects of Yoga
2. Therapeutic Uses of Yoga

Textbook:

1. BKS Iyengar, Light of Yoga, JP, 1st Ed, 2012.

Reference:

1. PayalGidwaniTiwari, Body Gaurders, CBS, 2nd Ed, 2009

EFFECTIVE ENGLISH

Theory Hours: 60
Total Hours: 60

Course Objective:

The objectives of this course is that after 40 hours of lectures, demonstrations and practicals the student will be able to Speak fluently, intelligibly and appropriately to teachers, Colleagues, Doctors, Patients and friends at the college, Hospital and hostel etc. about academic or (occupational) areas of interest. Course Outcome:

1. Students can gain knowledge about the various traditions writer and followed in English
2. Individuals can gain self – confidence in their own voice and speak out their opinions with confidence
3. Students will gain the ability to become a accomplished active readers
4. Helps to build the knowledge and understanding simultaneously through listening and give their point of view
5. Students will be able to write effectively in variety of professional and social setting
6. Acquire the ability to read and understand the literature and have the ability to identify the topics and formulate questions
7. Good communication skills which helps in easy rapport between the patient and therapist
8. Gain the fluency in speaking which helps in easy teaching method and presentation

UNIT – I INTRODUCTION

1. History of the language
2. Regional distribution
3. Variation in dialect and accent

UNIT – II PHONOLOGY

1. Consonants and vowels
2. Phontactics
3. Stress, rhythm and intonation
4. Regional variation

UNIT – III GRAMMER

1. Noun, Pronoun
2. Verb, Tense
3. Adjuncts
4. Adjectives

UNIT – IV SYNTAX

1. Clause syntax
2. Auxillary verbs
3. Vocabulary
4. Word formation
5. Pronounciation

UNIT – V PRESENTATION

1. Oral presentation & Panel discussion
2. Interview preparation
3. Clarity and specificity

Text Book:

1. O' Connor, I.D., Better English Pronunciation - Cambridge, Cambridge University.2009

Reference:

1. Water F.V.A , Proficiency Course in English – Hodder and Stronghton, London.1994
2. Tone Daniel, I.M. , English Pronouncing Dictionary –Dent and sons Ltd. London.2004

HEALTH CARE

Theory Hours: 50
Total Hours: 50

Introduction to Health

1. Definition of Health, Determinants of Health, Health Indicators of India, Health Team Concept.
2. National Health Policy
3. National Health Programmes (Briefly Objectives and scope) Population of India and Family welfare programme in India

Introduction to Nursing

1. What is Nursing? Nursing principles. Inter-Personnel relationships. Bandaging: Basic turns; Bandaging extremities; Triangular Bandages and their application.
2. Nursing Position, Bed making, prone, lateral, dorsal, dorsal re-cumbent, Fowler's positions, comfort measures, Aids and rest and sleep.
3. Lifting and Transporting Patients: Lifting patients up in the bed. Transferring from bed to wheel chair. Transferring from bed to stretcher.
4. Bed Side Management: Giving and taking Bed pan, Urinal: Observation of stools, urine. Observation of sputum, understand use and care of catheters, enema giving.
5. Methods of Giving Nourishment: Feeding, Tube feeding, drips, transfusion Care of Rubber Goods
6. Recording of body temperature, respiration and pulse, Simple aseptic technique, sterilization and disinfection. Surgical Dressing: Observation of dressing procedures

First Aid:

1. Syllabus as for Certificate Course of Red Cross Society of St. John's Ambulance Brigade.

Reference Books:

1. Preventive and Social Medicine by J.Park
2. Text Book of P & SM by Park and Park
3. Counseling& Communicate skills for medical and health, Bayne- Orient Longman Pvt. Ltd.

Constitution of India

Theory Hours: 50
Total Hours: 50

Unit-I:
Meaning of the term 'Constitution'. Making of the Indian Constitution 1946- 1950.

Unit-II:
The democratic institutions created by the constitution Bicameral system of Legislature at the Centre and in the States.

Unit-III:
Fundamental Rights and Duties their content and significance.

Unit – IV:
Directive Principles of States Policies the need to balance Fundamental Rights with Directive Principles.

Unit – V:
Special Rights created in the Constitution for: Dalits, Backwards, Women and Children and the Religious and Linguistic Minorities.

Unit-VI:
Doctrine of Separation of Powers legislative, Executive and Judicial and their functioning in India.

Unit – VII:
The Election Commission and State Public Service commissions.

Unit – VIII:
Method of amending the Constitution.

Unit – IX:
Enforcing rights through Writs:

Unit – X:
Constitution and Sustainable Development in India.

Reference Books:

1. J. C. Johari: The Constitution of India- A Politico-Legal Study-Sterling Publication, Pvt. Ltd. New Delhi.
2. J. N. Pandey: Constitution Law of India, Allahbad, Central Law Agency, 1998.
3. Granville Austin: The Indian Constitution – Corner Stone of a Nation-Oxford, New Delhi, 2000.