



MAHATMA GANDHI UNIVERSITY
of
MEDICAL SCIENCES & TECHNOLOGY
JAIPUR

Syllabus

B. Sc. Clinical Dietetics **(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.

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 BSc. Medical Technology Course.

SELECTION OF CANDIDATES:

Selection for B.Sc. Medical 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. Medical 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. Medical 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 + 1 External 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 + 1 External 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 70 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. Medical Technology degree course of different disciplines.
- (c) The pattern shall be as follows –

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

- (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. Clinical Dietetics 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 (3rd) year examination only when the backlog of all papers (theory and practical) of 1st and 2nd 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. Clinical Dietetics 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. Clinical Dietetics 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 Univerisity 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	Effective English	45	15	60
4	Health Care	50	-	50
5	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	Yoga	70	30	100
4	Effective English	70	30	100
5	Health Care	70	30	100
6	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 marks sheets of the University examinations. These marks shall not be counted for preparing the merit list.

Curriculum Outline
Recommended Teaching Hours of Instruction for each subject

First Year B.Sc. Clinical Dietetics

S. No.	Course Title	Hours
1.	Fundamentals of Nutrition & Food Science	100
2.	Nutritional Biochemistry	100
3.	Human Nutritional Requirements	100
4.	Practical	300
	Total hours :	600

Second Year B.Sc. - Clinical Dietetics

S. No.	Course Title	Hours
1.	Anatomy & Physiology	100
2.	Nutritional Microbiology	100
3.	Problems in Human Nutrition	100
4.	Practical	300
	Total hours	600

Third Year B.Sc. - Clinical Dietetics

S. No.	Course Title	Hours
1.	Institutional food administration	100
2.	Public Health & Community Nutrition	100
3.	General & Therapeutic Nutrition	100
4.	Practical	300
	Total hours	600

Total Hours- 600+600+600= 1800

Marks Distribution

First Year B.Sc. - Clinical Dietetics

Code No	Subject	Written			Practical		
		Theory	I.A. Theory	Total Theory	Practical + Oral	I.A. Practical	Total Practical
7301	Fundamentals of Nutrition & Food Science	70	30	100			
7302	Nutritional Biochemistry	70	30	100			
7303	Human Nutritional Requirements	70	30	100			
7304	Practical	-	-	-	210	90	300
Total		210	90	300	210	90	300

Second Year B.Sc. – Clinical Dietetics

Code No	Subject	Written-100			Practical-100		
		Theory	I.A. Theory	Total Theory	Practical + Oral	I.A. Practical	Total Practical
7305	Anatomy & Physiology	70	30	100			
7306	Nutritional Microbiology	70	30	100			
7307	Problems in Human Nutrition	70	30	100			
7308	Practical	-	-	-	210	90	300
Total		210	90	300	210	90	300

Third Year B.Sc. - Clinical Dietetics

Code No	Subject	Written-100			Practical-100		
		Theory	I.A. Theory	Total Theory	Practical + Oral	I.A. Practical	Total Practical
7309	Institutional food administration	70	30	100			
7310	Public Health & Community Nutrition	70	30	100			
7311	General & Therapeutic Nutrition	70	30	100			
7312	Practical	-	-	-	210	90	300
Total		210	90	300	210	90	300

Total Marks- 600+600+600=1800

**First Year B. Sc. Clinical Dietetics Course
(1 Year Duration)**

**Paper-I
Fundamentals of Nutrition & Food Science**

Theory Hours: 100

Total: 100

1. Optimum nutrition, balanced diet, reference man, reference woman
2. Different types of foods-
 - a) Cereals & grains,
 - b) Pulses & legumes,
 - c) Vegetables & fruits,
 - d) Nuts & oilseeds,
 - e) Milk & milk products,
 - f) Meat & poultry,
 - g) Sugar & fat.
3. Chemical & physical properties of foods - sol, gel, emulsion, retrogradation, gelatinization, maillard reaction, caramalization, pasteurization.
4. Different food processing & preservation methods (roasting, frying, boiling, baking, fermentation, germination, grilling, drying, freezing, canning etc)
5. Food adulteration
6. Food quality control & controlling organizations for food quality standards

Paper- II
Nutritional Biochemistry

Theory Hours: 100

Practical Hours: 100

Total: 100

- 1) pH, buffer & acid base balance
- 2) Physical characteristics, chemical characteristics & metabolism of
 - a) Carbohydrates
 - b) Protein,
 - c) Fat,
 - d) Minerals,
 - e) Vitamins
 - f) Water
 - g) Fiber
- 3) Respiration & biological oxidation of food
- 4) Hormones & Enzymes
- 5) Nucleic acid

Paper – III
Human Nutritional Requirements

Theory Hours: 100
Practical Hours: 100
Total: 100

1. Body composition and cellular basis of growth
 - a) Significance and methods used for measurement of body composition in nutrition.
 - b) Application of body composition in nutrition
 - c) Cellular Growth and development during life cycle.
 - d) Specific dynamic action of food
2. Nutritional requirements and recommended allowances for macro and micro nutrients for the entire life span (infancy to old age).
3. Methods of estimating requirements and allowances and a critical review & latest researches of the following:
 - a) Energy
 - b) Proteins and amino acids
 - c) Lipids
 - d) Vitamins
 - e) Minerals and trace elements
4. Critical evaluation of International recommended dietary allowances – American, Canadian, FAO/WHO/UNU & Recommended dietary allowances & guidelines for Indians
5. Evaluation of protein quality
 - a) Analytical methods for the determination of nitrogen and amino acids in foods.
 - b) Evaluation of protein quality of foods from their amino acids content
 - c) Biological methods
 - d) Clinical methods
 - e) Biochemical methods

Practical

Practical Hours: 300

Total: 300

Paper – I

Fundamentals of Nutrition & Food Science

1. Food preparation methods like boiling, roasting, frying, sautéing, baking, fermentation, malting, germination etc
2. Food preservation methods like canning, pickling, drying, roasting, freezing
3. Sensory evaluation of foods
4. New product development
5. Market survey on ready to eat/ ready to cook food products
6. Identifying physical & chemical properties of cereals, fats & oils, milk, egg, sugar
7. Identifying food adulteration

Paper – II

Nutritional Biochemistry

1. Principles of biochemistry – Introduction to working principles of :
 - Spectrophotometry, Chromatography, Electrophoresis, Acid base buffers
2. Titrimetric estimations
 - Determination of strength of acids and bases.
3. Estimation of Calcium,
4. Estimation of Vitamin C in lemon juice
5. Estimation of Protein by Kjeldahl's Method
6. Estimation of Iron by colorimetric method &
7. Estimation of glucose by colorimetric method
8. Determination of fat in foodstuff by sohxlet method
9. Determination of reducing sugars by Nelson's method

Paper – III

Human Nutritional Requirements

1. Evaluation of protein quality in different food stuffs using following methods
2. Calculation of chemical scores / amino acid score
3. Calculation of NDpCal% in different types of premixes
4. Project work on evaluation of nutrient quality in different nutraceuticals
5. To Compare intake of a person with the RDAs
6. Calculation of BEE & energy requirement of different height, weight, age, sex, temperature situations using different methods – Kleiber's formula, Harris Benedict equation, Broca index, FAO / WHO/ UNU equations & others & a comparative analysis of all
7. Make a menu which fulfill a day's requirement of following nutrients -
8. Protein, Iron, Calcium, folic acid & sodium

**Second Year B. Sc. Clinical Dietetics Course
(1 Year Duration)**

**Paper-I
Anatomy & Physiology**

Theory Hours: 100
Practical Hours: 100
Total: 100

Composition, structure & functions of

1. Cell,
2. Blood,
3. Skin,
4. Muscles & bones,
5. Circulatory system,
6. Respiratory system,
7. Digestive system,
8. Excretory system,
9. Sense organs,
10. Nervous system
11. Endocrine glands
12. Reproductive system

Paper - II
Food Microbiology

Theory Hours: 100
Practical Hours: 100
Total: 100

1. Introduction to food microbiology – relative humidity, water activity, pH of food, types of microorganisms, factors affecting growth of microorganisms
2. Chemical, physical & pathogenic changes in different foods due to microbes
 - a) Cereals,
 - b) Pulses
 - c) Vegetables & fruits
 - d) Milk & milk product
 - e) Meat & meat products
 - f) Fats, oil & sugar
 - g) Nuts & oilseeds
3. Prebiotics & Probiotics
4. Role of microorganisms in health & disease
5. Food borne infections & intoxication
6. Food safety & security assurance systems & different National & International food safety agencies

Paper – III

Problems in Human Nutrition

Theory Hours: 100
Practical Hours: 100
Total: 100

1. Major Nutritional problems- Protein energy malnutrition, kwashiorkor, marasmus, anemia, vitamin A deficiency, Iodine deficiency disorder.
2. Minor Nutritional Problems- scurvy, beri- beri, pellagra, rickets, osteomalacia, osteoporosis, zinc deficiency & fluorosis - Their prevalence, etiology, biochemical & clinical manifestations, diagnostic techniques, preventive & therapeutic measures
3. Assessment of Nutritional Status, Various techniques for assessment of nutritional status:
 - a) Anthropometric measurements: Definition, measurements, tools/instruments. Technique for measurements, standards for references, indices, classification, interpretation of data. Use of anthropometry for onetime assessment, growth monitoring and emergency situation.
 - b) Clinical examination
 - c) Biochemical estimations
 - d) Dietary survey
4. Introduction to causative factors, biochemical and clinical manifestation, treatment and therapeutic measures of following Inborn errors of metabolism: Disorders of amino acid metabolism i.e. Phenylketonuria, hypertyrosinaemia, hypervaltaemia, hyperhistidinaemia, hyper lysinaemia, homocystinuria. Carbohydrate metabolism i.e. Pentosuria, galactosaemia, Lipid metabolism i.e. Hyper chylomicronaemia, pure hypercholesterolaemia, mixed hyperlipidaemia, responding to vitamin therapy.
5. Food Safety and contamination: Naturally occurring toxins and antinutritional factors : Lathyrism, Epidemic dropsy.
6. Importance of organic foods

Practical

Practical Hours: 300

Total: 300

Paper – I

Anatomy & Physiology

1. Demonstration & identifying different body organs in human body

Paper – II

Nutritional Microbiology

1. Principle, use & maintenance of microscope
2. Study of different types of microbes in food like bacteria, yeast & fungi
3. Preparation of culture media
4. Techniques of culturing
5. Colony characteristics
6. Water & milk testing for microbes
7. Industrial field visit to see food safety following norms

Paper – III

Problems in Human Nutrition

1. Case Study: Assessment of nutritional status of a person / Identification of various clinical signs & symptoms of major nutritional problems and interpretation of data
2. Assessment of nutritional status using various techniques of various age groups e.g. Preschoolers/ students/ adults/ pregnant & lactating females
3. Use & Interpretation of growth charts
4. Determination of type of fat & fat composition of the diets through 24 hr recall & compare it with suggested values for SFA, PUFA, MUFA & essential fatty acids
5. Plan & prepare recipes for PEM, anemia, vitamin A deficiency

**Third Year B. Sc. Clinical Dietetics Course
(1 Year Duration)**

Paper – I

Institutional Food Administration

Theory Hours: 100

Total: 100

1. Introduction to food services & catering industry, development of food service institutions in India, types of services as affected by changes in the environment
2. Hospital food service as a speciality – characteristics, rates & services of food production, service & management of food service in a hospital. Role of a food service manager & dietician
3. Organizations, types of organizations & organizational chart
4. Catering management – Definitions, principles & functions. Tools of management, resources, attributes of a successful manager
5. Approaches to management- Traditional, system approach, total quality management
6. Management of Resources – Capital, space, equipment & furniture, materials, staff, time & energy. Procedures physical facility design & planning, selection of equipments
7. Purchase & store room management – purchase system, specifications, food requisition & inventory system quality assurance
8. Human Resource Management
9. Trade Union Negotiations & settlement
10. Financial management
11. Food Production & Service Operations – General planning, consideration of patients with specific nutritional & dietary needs, flow pattern

Paper –II
Public Health & Community Nutrition

Theory Hours: 100
Total: 100

1. Concept & scope of public health & community nutrition
2. Major demography of Rajasthan & India
3. Food availability & factors affecting availability of food, food security & adequacy of diets
4. Assessing community's nutritional needs
5. Nutritional problems of Indian community – epidemiology, nutritional & non nutritional signs, symptoms, treatment & strategies to improve nutritional status of the community - Health based interventions/ Food based interventions
6. National & International policies & Agencies for health & nutrition in India
7. Hazards to community health & nutrition – adulteration, pollution, pesticides, waste management, industrial effluence, sewage, toxins
8. Health & Nutrition Education – Steps in planning, implementation & evaluation. Use of education aids visual, audio, audio visual, traditional media, mass media etc.

Paper –III
General & Therapeutic Nutrition

Theory Hours: 100

Total: 100

1. Nutritional requirements & meal planning for normal physiological states of human life – infancy, growth period, adolescents, adult male, adult female, pregnant & lactating female, geriatrics.
2. Diet during disasters like famine, drought etc.
3. Diet for athletes,
4. Extreme Environmental temperatures : hot and cold, high altitude
5. Diet for astronauts etc.
6. Diet for weight management - Obesity, Underweight
7. Diet for metabolic disorders - Hypertension, Diabetes mellitus, Cardiovascular diseases
8. Diet in liver & gallbladder diseases (Jaundice, hepatitis, cirrhosis, cholecystitis, cholelithiasis, hepatic encephalopathy),
9. Diet for gastric disorders (constipation, diarrhea, irritable bowel syndrome, delayed gastric emptying, peptic ulcer, pancreatitis),
10. Diet for renal diseases (Acute renal failure, chronic renal failure, renal stones, dialysis)
11. Diet for anemia
12. Diet during surgeries (bariatric surgeries, GI surgeries),
13. Enteral & parenteral nutrition
14. Diet during allergies & infections - fever, cold, asthma, tuberculosis
15. Diet for autoimmune disorders gouty arthritis, rheumatoid arthritis
16. Drugs & Nutrient interaction
17. Diet in cancer
18. Diet in neurology & neurosurgery

Practical

Practical Hours: 300

Total: 300

Paper –I

Institutional food administration

1. Market survey for perishable, non perishable & processed food items with prices
2. Planning & preparation of food for various occasions & Institutions with cost effective resource
3. Management.
4. Institutional visit to see food administration
5. Quantity cookery classes

Paper – II

Public Health & Community Nutrition

1. Understanding how to reach to community & communication types & barriers & development of tools to reach community problems
2. Identifying community nutritional needs & plan a programme to improve nutritional status of the community
3. Field visit to different communities & educate them to improve nutritional status
4. Plan & prepare premixes for complementary feedings, pregnant & lactating females etc
5. Developing messages for nutrition & health education
6. Developing low cost nutritive recipes for community problems

Paper – III

General & Therapeutic Nutrition

1. Three months practical training in hospital for diet counseling
 - a) Diet counseling of Pregnant & lactating women
 - b) Diet counseling of pediatric patients
 - c) Diet counseling of surgery patients (hernia, cholelithiasis, cholecystitis, lapcoli, cellulitis, pancreatitis, bariatric surgery)
 - d) Counselling for enteral & parenteral feeds
 - e) Diet counseling for cardiac patients
 - f) Diet counseling for endocrinological disorders (diabetes & other endocrine diseases)
 - g) Diet counseling for hepatic patients
 - h) Diet counseling for renal patients
 - i) Counselling for trauma & infection cases (TB, Burn, RTA, Fever)
2. Presentation of 1 case study for each type of patient
3. Planning & developing recipes for different types of diseases – cardiac, diabetic, celiac, anemic, renal

MODEL PAPER

**B.Sc. CD-I
7301**

Funda.Nut.Food Sci.-I

B.Sc. Clinical Dietetics
Part-I (Main) Examination Month Year

Paper I
Fundamentals of Nutrition & Food Science

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 **Short notes (attempt any four)** 4x5 = 20
- a) Balanced Diet
 - b) Reference man & women
 - c) Caramelization
 - d) How to identify egg is fresh
 - e) HACCP

- Q.2 **Short notes (attempt any four)** 4x5 = 20
- a) Fermentation
 - b) Saponification number
 - c) Physical properties of emulsion with example
 - d) What is gelatinization
 - e) Freezing

Long question (attempt any two)

- Q.3 Explain dry methods of food preservation? 15
- Q.4 Describe chemical properties of cereals? 15
- Q.5 Describe physical & chemical properties of egg? 15

MODEL PAPER

B.Sc. CD-I
7302

Nutri.Biochem-II

B.Sc. Clinical Dietetics
Part-I (Main) Examination Month Year

Paper II Nutritional Biochemistry

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 **Short notes** 4x5 = 20
- a) Sources of vitamin B12
 - b) Functions of protein
 - c) Importance of dietary fibre
 - d) PUFA
 - e) Essential amino acids

- Q.2 **Short notes** 4x5 = 20
- a) Enzymes
 - b) RNA
 - c) Sources of iron
 - d) Good Fat
 - e) Monosaccharides

Long question (attempt any two)

- Q.3 Explain Glycolysis with diagram? 15
- Q.4 Explain major & minor nutrients in our diet with their sources & functions. 15
- Q.5 Types of fatty acids 15

MODEL PAPER

B.Sc. CD-I
7303

HumanNutrit.Req.-III

B.Sc. Clinical Dietetics
Part-I (Main) Examination Month Year

Paper III Human Nutritional Requirements

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 **Short notes** 4x5 = 20
- a) NDPcal%
 - b) Biological value of proteins
 - c) RDA for energy for infants
 - d) Protein requirements during pregnancy
 - e) Dye binding method

- Q.2 **Short notes** 4x5 = 20
- a) Energy requirements of reference Indian man
 - b) Reference protein
 - c) Name techniques for assessment of energy requirements
 - d) Bomb calorimeter
 - e) SDA

Long question (attempt any two)

- Q.3 Explain difference between RDA for energy & other nutrients. 15
- Q.4 Describe methods for evaluation of protein quality. 15
- Q.5 Describe nutritional requirements of infants in comparison to adults. 15

MODEL PAPER

**B.Sc. CD-II
7305**

AnatomyPhysi-I

B.Sc. Clinical Dietetics
Part-II (Main) Examination Month Year

Paper I
Anatomy & Physiology

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 **Short notes** 4x5 = 20
a) Water in human body
b) RBCs
c) Liver
d) Mitochondria
e) Retina

Q.2 **Short notes** 4x5 = 20
a) Golgi complex
b) Functions of blood
c) Pancreas
d) Nephrones
e) Pituitary hormone

Long question (attempt any two)

Q.3 Explain circulatory system with diagram. 15
Q.4 Describe blood cells with their importance. 15
Q.5 Describe digestion of protein in human body. 15

MODEL PAPER

**B.Sc. CD-II
7306**

Nutri.Micro-II

B.Sc. Clinical Dietetics
Part-II (Main) Examination Month Year

Paper II
Nutritional 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 **Short notes** 4x5 = 20
- a) Water activity & relative humidity
 - b) Types of microorganisms
 - c) Bacteria responsible for spoilage of milk
 - d) Healthy bacteria
 - e) FAO

- Q.2 **Short notes** 4x5 = 20
- a) Different types of molds
 - b) Bacteria responsible for spoilage of sweets
 - c) Parts of microscope
 - d) Food borne infections
 - e) Food toxicity

Long question (attempt any two)

- Q.3 Food safety system of India ? 15
- Q.4 Explain with diagram different types of bacteria? 15
- Q.5 Explain difference between probiotics & prebiotics. 15

MODEL PAPER

**B.Sc. CD-II
7307**

Prob.HumanNutri.-III

B.Sc. Clinical Dietetics
Part-II (Main) Examination Month Year

Paper III
Problems in Human Nutrition

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 **Short notes** 4x5 = 20
- a) Phenylketoneurea
 - b) Anemia
 - c) Fluorosis
 - d) 24 hrs recall method
 - e) Stunted growth

- Q.2 **Short notes** 4x5 = 20
- a) Galactosemia
 - b) Goiter
 - c) Kwashiorkor
 - d) Name of biochemical estimations for anemia
 - e) Lathyrism

Long question (attempt any two)

- Q.3 Explain protein energy malnutrition. 15
- Q.4 Describe clinical sign & symptoms of vitamin a deficiency 15
- Q.5 Describe anthropometric measurement technique. 15

MODEL PAPER

**B.Sc. CD-III
7309**

Inst.FoodAdmin.-I

B.Sc. Clinical Dietetics
Part-III (Main) Examination Month Year

Paper I
Institutional Food Administration

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 **Short notes** 4x5 = 20
- a) Types of institutions where food is prepared / served
 - b) Ala carte menu service
 - c) Definition of management
 - d) Principles of food administration
 - e) Work environment

- Q.2 **Short notes** 4x5 = 20
- a) Layout of facilities
 - b) Energy management
 - c) Sensory evaluation techniques
 - d) Personnel management
 - e) Hierarchie of an organization

Long question (attempt any two)

- Q.3 Explain types of meal services ? 15
- Q.4 Explain work simplification methods in institutions? 15
- Q.5 Describe steps in process of organization 15

MODEL PAPER

**B.Sc. CD-III
7310**

PublicHealth Com.Nutrition-II

B.Sc. Clinical Dietetics
Part-III (Main) Examination Month Year

Paper II
Public Health & Community Nutrition

Time : 3 hours
Maximum marks 70

Attempt any 4 out of 5 questions

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 **Short notes** 4x5 = 20
- a) Types of communication
 - b) Barriers in communication
 - c) Major public health problems
 - d) Anemia
 - e) Vulnerable groups

- Q.2 **Short notes** 4x5 = 20
- a) Goiter
 - b) Name National public health programmes
 - c) Prevalance of malnutrition in Rajasthan
 - d) Education methods in community
 - e) qualities of a leader

Long question (attempt any two)

- Q.3 Describe Health & nutrition related agencies in India 15
- Q.4 ICDS 15
- Q.5 Describe in detail major nutritional problems in community 15

MODEL PAPER

**B.Sc. CD-III
7311**

Gen. Therapeutic Nutrition-III

B.Sc. Clinical Dietetics
Part-III (Main) Examination Month Year

Paper III
General & Therapeutic Nutrition

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 **Short notes** 4x5 = 20
- a) Name the factors affecting meal plan
 - b) Factors affecting energy requirements of adult male.
 - c) Iron requirements of pregnant female
 - d) Points to be considered while planning diet for disasters
 - e) Factors affecting protein requirements of geriatrics

- Q.1 **Short notes** 4x5 = 20
- a) What should be percent calorie intake from fat in total calorie intake?
 - b) What points will you consider while planning meals for a growing child?
 - c) Which nutrients are more important in the diet of an athlete & why?
 - d) Points to be taken into account while planning meals for an adolescent girl.
 - e) Supplementary feeding

Long question (attempt any two)

- Q.3 Explain diet in space. 15
- Q.4 Describe modifications with reasons in the diet of weight reduction 15
- Q.5 Explain different types of enteral feedings 15

Elective Paper- Non – University Examination
DISASTER MANAGEMENT

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

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
- Ancharia 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,
**INFORMATION AND COMMUNICATION TECHNOLOGY IN HEALTH
EDUCATION**

Theory Hours: 45hrs

Practical 15hrs

Total =60 hrs

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 Literacyl M<egraw Hill,
2. Simon J. Gibbs, Dinoysios C. Tschritziz, —Multimedia programmingl, Addison Wesley
3. John F.Koefgel Buford, —Multimedia Systemsl, Addison Wesley
4. John Vince, —Virtual Reality Systemsl Addison Wesley.
5. AndressF.Molisch, —Wideband Wireless digital communicationl Pear Education Asia

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 hrs

Total =60 hrs

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. Pronunciation

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: 50hrs

Total = 50 hrs

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: 40hrs

Total = 40 hrs

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.