SRI BALAJI VIDYAPEETH

(Deemed to be University Declared u/s 3 of UGC act 1956)
Accredited by NAAC with 'A' Grade
Pondicherry – 607 402.
www.sbvu.ac.in

MAHATMA GANDHI MEDICAL COLLEGE & RESEARCH INSTITUTE, PONDICHERRY

FACULTY OF ALLIED HEALTH SCIENCES

M.SC CLINICAL NUTRITION

2019 -20 ONWARDS

Department of Biochemistry

Mahatma Gandhi Medical College and Research

CHOICE BASED CREDIT SYSTEM (CBCS)

(As approved in the Academic Council at the meeting held on 22-05-2019)

INDEX

POLICY ON COURSES OFFERED UNDER FACULTY OF ALLIED HEALTH SCIENCES

PREAMBLE

Sri Balaji Vidyapeeth, Deemed to be University, established under Section 3 of UGC Act, 1956, Accredited by NAAC with A Grade offers various courses under the Faculty of Medicine, Faculty of Dentistry, Faculty of Nursing Sciences and Faculty of Allied Health Sciences.

"Allied Health Professions are a distinct group of health professionals who apply their expertise to prevent disease transmission, diagnose, treat and rehabilitate people of all ages and all specialties. Together with a range of technical and support staff they may deliver direct patient care, rehabilitation, treatment, diagnostics and health improvement interventions to restore and maintain optimal physical, sensory, psychological, cognitive and social functions." - Organizationof International Chief Health Professions Officers (ICHPO).

In March 2011, the Ministry of Health and Family Welfare nominated the Public Health Foundation of India (PHFI) as its technical partner and constituted the National Initiative for Allied Health Sciences (NIAHS) secretariat with a mandate to develop a framework to improve allied health training, education and regulation in the country. (Yet to be notified by Government of India).

Sri Balaji Vidyapeeth has introduced several innovative need based courses under the Faculty of Allied Health Sciences at Undergraduate and Postgraduate levels keeping in mind the initiative ofMinistry of Health & Family Welfare, Government of India. In an era marked by expanding globaljob opportunities, these courses are bound to create an awareness among the students to suitthemselves in the Health Care Team. Curricula have been designed in an objective manner andare aimed at cognitive, affective and psychomotor domains of learning. Furthermore all coursesare designed in Choice Based Credit System (CBCS) made to suit the convenience of the students. The Undergraduate courses mainly concentrate in creating professionals who form the part of theHealth Care Team. The role of these professional is to ably assist the doctor in treatment as wellas prognosis and in many a times form the core professional of the team. The proficiency andcompetence of the Undergraduates is fortified by the promulgation of a unique internship cumresearch programme.

The Postgraduate courses mainly aim at shaping a graduate into a full professional. Also these postgraduate courses help the graduates as well as the postgraduates to acquire specific skills on various adjunct therapies and techniques.

POLICY ON ELIGIBILITY, ADMISSION, & COURSE DURATION OF PG COURSES

At Sri Balaji Vidyapeeth, we empower the departments of all the constituent colleges to contribute to the development of innovative, need, value based and job oriented courses taking into considerations the interests of the stake holders.

The Post graduate courses (PG) are presently being offered under the Choice Based Credit System (CBCS) mode as per the Guidelines of UGC. The duration of the course will be two years.80 percent of attendance is mandatory for appearing at the University Examinations. The students should also complete a short duration project (in their areas of interest) and also maintain and submit a log book. The maximum time limit for completion of the course will be four years. However, the Dean / Principal, AHS has the discretionary powers to extend the course duration onvalid grounds (Health, Maternity, Natural Disaster, etc.).

Eligibility for Admission

A candidate seeking admission in the M.Sc Clinical Nutrition Programme shall be completing the BSc Food Science and Nutrition, B.Sc., Clinical Nutrition, B.Sc., Home Science (with majors in Nutrition and Dietetics) BSc Nursing degree from any University/ Institute recognized by UGC with50%mark

PAYMENT OF TUITION AND OTHER FEES

Every student shall pay tuition fee and other fee, as prescribed by the University, within the due date notified. The fees are subject to revision as per rules of the University. All fees, once paid to the University, will not be refunded or adjusted for any other purpose under any circumstance.

PROGRAMME OBJECTIVES:

At the end of the course the candidates must be able to:

- Explain the role of nutrition in health
- Make Physiological, anthropometric and biochemical assessment of the nutritional status.
- To plan a therapeutic diet according to the individual or patients requirement in disease conditions.
- Monitor and evaluate nutrition therapy
- Educate the patients and family regarding nutritional care to be followed
- Comprehend Logistics of enteral and parenteral nutrition.
- Objectivize therapeutic diet counseling of patients in the outpatient department

- Understand Basic concepts of nutraceuticals and their applications.

CAREER PROSPECTS / PLACEMENT OPPORTUNITIES:

As Faculty in training institutes for clinical nutrition, Placement in R and D laboratories

As professional nutritional and diet consultants in healthcare set ups /corporate organizations/NGOs/industries/independent practice and geriatric homes

Other salient feature: There are very less number of Universities in India offering M.Sc clinical nutrition, which is an upcoming branch. Many corporate laboratories industries and R & D centres are establishing branches in India since the recent past. There is always growing demand, competition & urge to improve their own quality. Hence there is ample scope and opportunity for those who are willing to perceive this course

OUTLINE OF THE CHOICE BASED CREDIT SYSTEM (CBCS) FOR POSTGRADUATE DIPLOMA PROGRAMME

Credit System Credit System (CBCS): The CBCS provides choice for students to select from the prescribed courses (Hard core courses (core course) and Soft core courses (elective courses).This is to enhance the quality and mobility of the students within and between the Universities in the country and abroad.

Credit hours

16 Theory classes = 1 credit

32 Practical/Tutorial/Clinical training/Research project = 1 credit

Subjects	Credits
Each core subjects	4 Credits
Skill Enhancement course (SEC)	3 Credits
Generic Elective course (GEC)	3 Credits
Discipline Specific Electives (DSE)	3 Credits

Courses: The courses offered under this Programme of Study are represented as Hard Core courses(core course) and Soft Core courses (elective course).

a) **Hard core course (core course):** A Hard core course may be a Theory, Practical, clinical rotation/field work or Research Project Work which are compulsory component studied by candidate to complete the requirement of their programme**.**

b) **Soft Core or Elective Course:** Soft core Course may be Theory, Practical, field work, clinical rotation or Research Project Work which can be chosen from the list of courses offered by the department/CBCS under SBV/national centre for a particular programme of a study. Soft Course may be supportive to their discipline of study or providing an expanded scope or exposure to multiple disciplines of study to nurture the candidate's proficiency/skill.

i) **Discipline Specific Elective (DSE) Course:** An elective course which is supportive or related to the discipline/subject (i.e. supportive to hard core course) is called a Discipline Specific Elective (DSE) Course.

ii) **Generic Elective (GE) Course:** An elective course which is unrelated to the discipline/subject (i.e. unrelated to hard core course) to expand their knowledge chosen by a candidate is called a Generic Elective.

iii) **Skill Enhancement Courses (SEC):** This course chosen by candidate which provides additional value-based and skill-based knowledge to increase their employability.

CRITERIA FOR UNIVERSITY EXAMINATIONS ON COURSES OFFEREDUNDER FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

1) **Attendance Requirements**: 80% hours of learning in each Core Subjects / Electives / Practical's /clinical rotation/Postings for appearing for the university exams.
2) **Minimum marks required to be eligible for University Examination**: 50% marks in the internal assessment (Theory / Practical) are required for the candidate to be eligible to appear in the University Examinations.
3) **Passing Minimum**: 50% aggregate both in theory and practical's including internal assessment marks is required for a candidate to pass in the University Examinations.
4) **Submission of Project and Record Note Books for practical examinations**

   Candidates appearing for practical examinations should submit bonafide Record Note Books and Project prescribed for practical examinations, otherwise the candidates shall not be permitted to appear for the practical examinations.

GRADING

Marks obtained by candidate	**Equivalent grade letter**	**Grade descriptor**	**Grade point**
85 % & above	O	Outstanding	10
75-84	A+	Excellent	9
65-74	A	Very good	8
60-64	B+	Good	7
55-59	B	Above average	6
50-54	C	Average pass	5
49 & below	F	Reappear	0
	A B	Absent	0

A student obtaining **Grade F** shall be considered failed and will be required to reappear in the examination.

Conversion formula for Percentage to CGPA

Percentage divided by 9.5 = CGPA

Award of Class

Class division will be based on CGPA grade
≥ 7.8 grade point = Distinction Division
≥ 6.8 and < 7.7 grade point = First class Division
≥ 6.3 and < 6.7 grade point = Second class Division
≥ 5.2 and < 6.2 grade point = Third class Division
< 5.2 and below – Fail

Cumulative Grade Point Average (CGPA): It is a measure of overall cumulative performance of a student over all exams. The CGPA is the ratio of total credit points secured by a student in various courses in all exams and the sum of the total credits of all courses in all the University exams. It isexpressed up to two decimal places.

Grade Point: It is a numerical weight allotted to each letter grade on a 9.5 point scale.

Transcript: Based on the credits earned, a transcript shall be issued to all the registered students after the completion of the program indicating the hours of study and structure of the curriculum delivery as prescribed in his/her curriculum and completed by the student. The transcript will display the course details, including course code, title, and number of credits, hours and type of contact hours in a non-semester.

INTERNAL ASSESSMENT

- Continuous Internal Assessment (CIA) for all AHS programs with a minimum of 4 Assessments per year.
- Internal Assessment will be done in each subject according to the scheme of examinations. The IA marks will be on the basis of performance in the assignment, class tests and practical test in the clinical areas.

Evaluation of Clinical Rotation

Lab, Clinical rotation/postings - To conduct practical's or viva based on the Heads of the concerned department's decision and the total 100 marks to be sent to COE through proper channel to find a place in the transcript.

Question Paper Pattern

The following question paper patterns shall be followed for CBCS pattern syllabi for the candidates admitted from the academic year 2019-20 onwards.

CORE SUBJECTS

For **POST GRADUATE DEGREE NON-SEMESTER PROGRAMME -** Each Core Subjects University Examcarries -100 marks of 80(Theory) + 20 (IA marks) which consists of

Theory – 80 marks			
I	Short Essay questions	10 (*2 choice)	8 x 10=80

The University duration of 80 marks – 3 Hours

ELECTIVE SUBJECTS

For all UG/PG/DIPLOMA NON SEMESTER **COMPULSORY, GENERIC & DISCIPLINE** Elective UniversityExam papers carries- 50 marks of 40 (Theory)+10 (IA marks) which consists of

Theory – 40 marks			
I	Short Essay questions	5 (*1 choice)	4 x 10=40

*** Number of choices given**

For **SKILL BASED ELECTIVES** from 2019-20 batch onwards all UG/PG/DIPLOMA AHS courses will have 40 marks as university Practical cum Viva examination & 10 marks as Internal Assessment =50 marks.

50 marks of the **COMPULSORY, GENERIC, DISCIPLINE & SKILL BASED ELECITIVES** which will beconverted to 100 marks in the transcript.

CONDONATION FOR SHORTAGE OF ATTENDANCE
Condonation of shortage of attendance in aggregate up to 10% in each Year may be granted bythe college Academic Committee and as per regulations of university.

RESEARCH PROJECT: Candidates should carry out individual projects only. Research Project shallbe allotted at the beginning of the first year. Faculty members of the respective colleges must serve as guides and Co- guides from the other institutions may be allowed. Research Project workin THREE copies have to be submitted to university 30 days before the actual schedule of the exam. Research Project report evaluation will be done and Viva-voce will be conducted by both the external and internal examiners during university practical examination for 50 marks

Components	**Marks(50)**
Research Project	30
Viva	20
Total	50

Examiners: 2 Internal, 2 external

There shall be four examiners for practical, two internal and two external. External examiner should be a regular teaching faculty of any medical college with either a MSc., PhD in Biochemistry/Clinical nutrition/Nutrition and dietetics should be Associate Professor and above. Theory papers will be evaluated by both external and internal examiners.

Question paper setters: should be a regular teaching faculty of any recognized medical collegewith either a MD degree or M.Sc., PhD.,(Biochemistry/clinical nutrition/Nutrition & dietetics)

Practical Duration: Two days

BOARD OF STUDIES:

MEMBERS:

External members:

1. Dr. Nandeesha T, Additional Professor, Department of Biochemistry, JIPMER,Pondicherry

2. Dr.S. Haripriya, Associate Professor, Dept. of Food science and technology, School of life science, Pondicherry University.

Internal members:

1. Dr. S. Sumathi, Professor& Head, Dept. of Biochemistry, MGMC&RI
2. Dr. Kulkarni Sweta, Associate Professor, Dept. of Biochemistry, MGMC&RI
3. Mr. K. Ramachandran, Tutor, Dept. of Biochemistry, MGMC&R
4. Mrs. Rajalakshmi, lecturer, Nutrition and Dietetics, KGNC

FIRST YEAR

a) Theory : (7 papers)

- Core theory paper-1: Nutritional Biochemistry
- Core theory paper-2: Food science
- Core theory paper-3: Nutraceuticals and Functional Foods
- Core theorypaper-4:Medical Nutrition Therapy -I
- Core theorypaper-5:Human Anatomy and Physiology
- Discipline specific elective paper: Research methodology and biostatistics
- Generic elective paper: (Environmental sciences or Basics of hospital management or Lifestyle disorders- choose any one)

b) Practical:

- Core Lab-1: Nutritional Biochemistry
- Core Lab-4:Medical Nutrition Therapy -I

SECOND YEAR

a) Theory:

- Core Theory Paper-6: Food Microbiology
- Core Theory Paper-7: Nutrition Through Life Cycle
- Core Theory Paper-8: Public Health Nutrition
- Core Theory Paper-9: Medical Nutrition Therapy –II
- Discipline elective paper: (Sports Nutrition or Palliative care or Nutritional Assessment & Surveillance - choose any one)
- Skill enhancement elective paper: (Basic life support or English for clinical communication or Basics of Yoga and Practice – choose any one)

b) Practical:

- Core Lab-7: Nutrition Through Life Cycle
- Core Lab-9: Medical Nutrition Therapy -II

c) Research project:

- Candidates should carry out individual projects only.
- Research Project shall be allotted at the beginning of the first year.
- Faculty members of the respective colleges must serve as guides
- Co- guides from the other institutions may be allowed.
- Research Project work in THREE copies have to be submitted to university 30 days before the actual schedule of the exam.
- Research Project report evaluation will be done and Viva-voce will be conducted by both the external and internal examiners during university practical examination for 50 marks.
- The credits earned will be included for the calculations of the CGPA and the evaluation methods are mentioned in the assessment

d) Clinical rotation: The clinical rotation /clinical postings are assessed based on their satisfactory attendance, performance in the postings/research labs and the submission of the logbook. Internal assessment marks given by the department and this score would then be converted into grade point & Letter grade as per the SBV table of Absolute Grading system.

Reference Books

1. LubertStryer 'Biochemistry'
2. Medical Textbook of Biochemistry Chaterjee.
3. Lehninger A. L. (1990) 'Principles of Biochemistry' New Delhi - CBS Publisher and Distributor.
4. Modern Nutrition in Health and Disease 10th edition by Maurice E. Shils
5. Alfred H.Katz, Prevention and health, the Haworth, Press, New York 1999.
6. Nutritional biochemistry of vitamins David a bendor.
7. Achayya, K.T.:(1998) A Historical Dictionary Of Indian Foods, Oxford Publishing Co.
8. Mahindru, S.N. (2002). Food Additives Characteristics, Detection and Estimation, Tata McGraw-Hill Publishing Co. Ltd. New Delhi.
9. Research MethodologyBy C.R Kothari
10. International Life Sciences Institute Present Knowledge in Nutrition – latest edition
11. Swaminathan S.: Advanced Textbook On Food & Nutrition Vol. 1 & N (2nd Ed. Revised Enlarged) Bapp Co. 1985.
12. Robinson. Basic Nutrition And Diet Therapy (8th Edition)
13. Robinson, Lawler: Normal & Therapeutic Nutrition (17th Ed.) Macmillan Publishing Co. 1986.
14. Davis J. and Sherer, K. (1994): Applied Nutrition and Diet Therapy for Nurses, 2nd edition, W.B. Saunders Co.
15. Davidson's Human Nutrition – Geissler.
16. Nutrition and Biochemistry for Nurses by Jacob Anthikad
17. Willims S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
18. Thomas, B.: Manual of Dietetic Practice, 1996.
19. L. MatareseGottschlich Contemporary Nutrition Support Practice, Saunders 1998
20. ASPEN; Nutrition Support, Dietetics
21. Clinical dietetics and nutrition by F.P Antia and Philip Antia.

Journals:

1. Nutrition Reviews
2. Journal of Nutrition
3. American Journal of Clinical Nutrition
4. British Journal of Nutrition
5. European Journal of Clinical Nutrition
6. International Journal of Vitamin and Nutrition Research
7. Nutrition Research
8. Ann NutrMetab
9. Indian Food Packer, All Indian Food Preserves Association, Delhi.
10. Journal of Dairy Science.
11. Advances in Food Research
12. Indian Council of Medical Research. Nutritive Value of Indian Foods – Latest Publication.
13. Indian Council of Medical Research. Recommended Dietary Intakes for Indians – Latest Recommendations.
14. World Reviews of Nutrition and Dietetics.
15. WHO Technical Report Series

Annexure 1

Course Structure and scheme of examination (curriculum)

First year M.Sc in Clinical Nutrition

Sl. No	Course	Category	Course Title	Hours / Non-Sem	Credit	University marks	IA marks	Total marks
1	Hard core	Core theory Paper- 1	Nutritional Biochemistry	64	4	80	20	100
2		Core theory Paper- 2	Food science	64	4	80	20	100
3		Core theory Paper- 3	Nutraceuticals and Functional Foods	64	4	80	20	100
4		Core theory Paper- 4	Medical Nutrition Therapy -I	64	4	80	20	100
5		Core theory Paper- 5	Human Anatomy and Physiology	48	3	80	20	100
6		Core Lab-1	Nutritional Biochemistry	128	4	80	20	100
7		Core Lab-4	Medical Nutrition Therapy -I	128	4	80	20	100
8		Clinical Rotation	Clinical Rotation (Clinical departments)	256	8	-	100	100
9	Soft core	Discipline specific elective (DSE-01)	DSE-01-Research Methodology and Biostatistics	48	3	-	100	100
10		Generic elective Paper (to choose any one)	GE- 01-Environmental Sciences	48	3	-	100	100
			GE- 02-Hospital Safety & Management					
			GE- 03-Lifestyle disorders					
Total				976	41	560	440	1000

Second year M.Sc in Clinical Nutrition

Sl. No	Course	Category	Course Title	Hours / Non-Sem	Credit	University marks	IA marks	Total marks
1	Hard core	Core theory- 6	Food Microbiology	64	4	80	20	100
2		Core theory- 7	Nutrition Through Life Cycle	64	4	80	20	100
3		Core theory- 8	Public Health Nutrition	64	4	80	20	100
4		Core theory- 9	Medical Nutrition Therapy -II	64	4	80	20	100
5		Core Lab-7	Nutrition Through Life Cycle	128	4	80	20	100
6		Core Lab-9	Medical Nutrition Therapy -II	128	4	80	20	100
7		Clinical Rotation	Clinical Rotation (Clinical departments)	160	5	-	100	100
8		Research project		192	6	50(30+20 viva)	-	50
9	Soft core	Discipline specific elective 02	DSE-1-Sports Nutrition	48	3	-	100	100
10		Skill enhancement elective Paper (to choose any one)	SE-1 Basic Life Support	48	3	-	100	100
			SE-2 English for clinical communication					
			SE-3 Basic of Yoga and Practice					
Total				976	41	530	420	950

Total Credit for two years duration = 82 Credits

SYLLABUS FOR M.Sc CLINICAL NUTRITION
FIRST YEAR
CORE THEORY PAPER – I -NUTRITIONAL BIOCHEMISTRY

UNIT I: :Cell Biology and Chemistry &Metabolism of Carbohydrate

Cell Biology: Structure and functions of cell organelle, Cell membrane- structure and functions and transport across cell membrane.

Chemistry of Carbohydrate -Classification, properties, and functions of monosaccharide, disaccharide, oligosaccharide, polysaccharide and glycoprotein.

Metabolism of Carbohydrates- Digestion & Absorption of Carbohydrates, Disorders associated with Digestion and Absorption of Carbohydrates**,** Glycolysis, Energy Yield Per Glucose Molecule Oxidation , Rapoport-Luebering Shunt, Formation and Fate of Pyruvic Acid, Citric Acid Cycle, Metabolism of Glycogen – Glycogenesis, Glycogenolysis, Metabolic Significance of HMP Shunt, Clinical Importance of Uronic Acid Pathway, Metabolic Pathways Involved in Gluconeogenesis, Regulation of Gluconeogenesis, Metabolism of Galactose, Metabolism of Fructose and sorbitol pathway, Regulation of Blood Glucose (Homeostasis), Blood Sugar Level and its Clinical Significance, diabetes mellitus-classification, laboratory diagnosis, clinical presentation, complication of DM , diabetic keto acidosis, glycogen storage disorders, galactosemia, fructosuria, hereditary fructose intolerance, glucose tolerance test- preparation, procedure, interpretation, glycated hemoglobin, fructosamin and anhydroglucitol.

UNIT II: Chemistry &Metabolism of lipid and Protein & amino acids:

Chemistry & Metabolism of lipids- Classification, properties and functions of simple, compound and derived lipids, essential fatty acids and functions of prostaglandins.

Metabolism of Lipids: Digestion & Absorption of Lipids, fatty acid oxidation, metabolism of ketone bodies, metabolism of cholesterol, plasma lipoproteins and their metabolism, adipose tissue metabolism, alcohol metabolism, Refsum's disease, Zellweger syndrome, ketosis, ketoacidosis, sphingolipidoses (sphingolipid storage disorders), fatty liver, familial hypercholesterolaemia, atherosclerosis - risk factors & prevention of atherosclerosis, hypolipoproteinemias and hyperlipoproteinemias.

Chemistry and Metabolism of proteins and amino acids - Classification, properties, structural organization and denaturation of proteins, biological important peptides, classification and properties of amino acids, functions of plasma proteins, structure and functions of immunoglobulins**.**

Metabolism of Proteins and Amino Acids: Digestion& Absorption of Amino Acids, Urea cycle (Krebs-Henseleit Cycle) and associated disorders, Metabolism of individual aminoacids and their associated inborn errors.

UNIT III: ENZYMOLOGY & BIOLOGICAL OXIDATION:

Enzymology - Classification of Enzymes, Specificity of Enzymes , Kinetic Properties of Enzymes, Factors Affecting Enzyme Action and Enzyme Inhibition, Enzymes and Isoenzymes of Clinical Importance–cardiac biomarkers and Serum Enzymes in Liver Diseases.

BIOLOGICAL OXIDATION- Components of Electron Transport Chain (ETC) , Inhibitors of Electron Transport Chain, Oxidative Phosphorylation , Uncouplers of Oxidative Phosphorylation and Significance of Brown adipose tissue.

UNIT IV: VITAMINS & MINERAL METABOLISM:

Vitamin Metabolism: Fat and water soluble vitamins- source, RDA, functions and deficiency manifestation. **Metabolism of Minerals and Trace Elements –** source, RDA, functions and deficiency manifestations of Sodium , Potassium , Chlorine , Calcium , Phosphorus, Sulphur, Iron , Copper , Magnesium , Fluorine , Zinc , Manganese , Chromium and Selenium.

UNIT V: NUTRITION &FLUID AND ELECTROLYTE BALANCE

Nutrition: Energy metabolism – Respiratory Quotient, Specific Dynamic Action foods, Basal Metabolic Rate (BMR), dietary fiber, biological value of proteins, nitrogen balance, balanced diet, Recommended Dietary Allowance (RDA), Regulation of food intake, Disorders of nutrition - protein calorie (energy) malnutrition, metabolic syndrome and obesity.

Fluid and Electrolyte Balance and Disorders – Physiology of Homeostasis, Body water compartments, Electrolyte concentration of body fluid compartments, Regulation of electrolyte and water balance, laboratory diagnosis and disorders.

References:

Textbooks recommended (Latest editions):

1. Textbook of Biochemistry for Medical students- DM.Vasudevan-8th edition-2017
2. Lehninger's Principles of Biochemistry –Nelson and Cox-7th edition-2017
3. Text book of Biochemistry with clinical correlations - Thomas M. Devlin-7th edition.
4. Biochemistry - Lubert Stryer-8th edition.
5. Harper's Illustrated Biochemistry - Robert K. Murray et al-31st edition.
6. Textbook of Clinical Chemistry and molecular diagnostics- Tietz-6th edition-2017
7. Biochemistry - Voet& Voet-2018
8. Lippincott's Illustrated Reviews: Biochemistry - Pamela C. Champe and Richard A. Harvey-7th edition-2017
9. Clinical Chemistry in Diagnosis & Treatment - Philip D. Mayne-6th edition
10. Clinical chemistry – Marshall-8th edition-2016
11. Textbook Medical Biochemistry - Chatterjee& Shinde-8th edition
12. Textbook of Biochemistry – Dinesh Puri-3rd edition

CORE THEORY PAPER –I-NUTRITIONAL BIOCHEMISTRY

BLUE PRINT

Unit No.	Unit	Weightage (%)	Marks
I	Cell biology and Chemistry &metabolism of carbohydrate	25 %	20
II	Chemistry &metabolism of lipids and protein & amino acids	25 %	20
III	Enzymology & biological oxidation	12.5%	10
IV	Vitamins & mineral metabolism:	25 %	20
V	Nutrition &fluid and electrolyte balance and disorders:	12.5%	10
	TOTAL	100	80

MODEL QUESTION PAPER

FIRST YEAR M. SC. CLINICAL NUTRITION

CORE THEORY PAPER-I- NUTRITIONAL BIOCHEMISTRY

Time: 3 hrs **Max Marks: 80**

Short Essayquestions :(any eight) 8 x 10 = 80 marks

1. Explain the fluid mosaic model of cell membrane with suitable diagram. Describe Active transport mechanism. (5+5)
2. Describe the process of Glycolysis. Explain the regulation & Energetics of Glycolysis. (6+4)
3. Classify phospholipids with examples and mention their functions.
4. Explain the biochemical steps in urea cycle and add a note on hyperammonemia.
5. Classify enzymes. Explain in detail the factors affecting the velocity of an enzyme reaction.
6. Explain the Vitamin A under following headings

   a) dietary sources, b) daily requirements, c) biochemical functions and d) deficiency manifestations
7. Describe the dietary sources, daily requirement, functions and deficiency manifestations of iron.
8. Define BMR. Describe the various factors affecting BMR.
9. Explain the hormonal regulation of fluid and electrolyte balance.
10. Outline the steps involved in the β-oxidation of fatty acids. Add a note on energetics.(7+3)

CORE THEORY PAPER-II- FOOD SCIENCE

UNIT I: 12 hours

Cereals and Legumes: Structure and composition of cereals and legumes. Processing and Toxic constituents in cereals and legumes. Fermented products, method of cooking and germination

UNIT II : 14hours

Fats and Oils: Effect of processing on chemical structure and physical properties- Precursors of aroma compounds. Functional properties of fat and uses in food preparation, inter- estrification of fats. Hydrogenated fat, Lipid- protein complexes, emulsion, fat deterioration and fat substitutes.

UNIT III: ` 13 hours

Milk and Milk products: Composition, physical and functional properties- Denaturation-Effect of processing and storage. Cultured milk, yogurt, butter, whey, cheese, concentrated and dried products, frozen desserts, dairy product substitutes.

UNIT IV : 12hours

Meat and meat products: Muscle composition, post mortem changes. Characteristics and structure of meat, poultry, egg and fish. Processing and preservation of meat, poultry, egg and fish.

UNIT V: 13 hours

Fruits and Vegetables: Enzymes in fruits and vegetables, Flavour constituent,. Plant Phenolics Pigments. Post-harvest changes, Texture of fruits and vegetables, Effect of storage , processing and preservation.

REFERENCES

1. Potter,N. and Hotchkiss,J.H.(2005).Food Science, Fifth Edition, CBS Publishers and Distributors, New Delhi.

2. Charley,H.(2002).Food Science ,JohnWiley and Sons, New York.

3. Salunke,D.K and Kodam,S.S. (2001).Handbook of vegetable science and Technology, Marcel Dekker,Inc,270,Madison Avenue, New York.

4. Borwankar,R.P and Shoemaker,C.E.(1992).Rheology of Foods.Elsevier Science Publishers Ltd., England.

5. Salunke,D.K and Kodam,S.S . (2001). Handbook of Vegetable Science and Technology, Marcel Dekker,Inc., 270,Madison Avenue, New York,NY,10016

MODEL QUESTION PAPER
FIRST YEAR M. SC. CLINICAL NUTRITION

CORE THEORY PAPER-II-FOOD SCIENCE

LAQ (**Answer Any Eight Questions)** **(8 x 10 = 80 marks)**

1. Explain the structure and composition of wheat.
2. Benefits of fermentation and process of extruded product
3. Explain the formation virgin oil
4. Write the physical and chemical structure of peanuts
5. Write the step by step process in cheese making
6. State the difference between curd and yogurt
7. Write what is smoking of meat and the benefits of smoking
8. Explain the post mortem changes in meat
9. Write the post harvesting changes in fruits
10. Explain any four preservation techniques used to preserve vegetables

FIRST YEAR M.Sc CLINICAL NUTRITION

CORE THEORY PAPER-II-FOOD SCIENCE

BLUE PRINT

Unit No.	Unit	Weightage	Marks Allotted
I	CEREALS AND LEGUMES	25%	20
II	FATS AND OILS	12.5%	10
III	MILK AND MILK PRODUCTS	25 %	20
IV	MEAT AND MEAT PRODUCTS	25 %	20
V	FRUITS AND VEGETABLES	12.5%	10
	TOTAL	100%	80

- The duration of Examination (University) is Three (3) hours.
- The total marks for the University Examination will be 80 marks.

I. Long Answer Questions : 10X 8 marks = 80 marks (Choice 8out of 10)

TOTAL = 80 marks

CORE THEORY PAPER-III- NUTRACEUTICALS AND FUNCTIONAL FOODS

(THEORY)(DURATION 64 hrs)

Unit – 1 Introduction to Nutraceuticals 12 hours

Definitions, Nutraceuticals, A brief review of historical and technological aspects of Nutraceuticals and its uses in pharmacological industry and its health benefits.

Unit – 2 Functional foods – definition, Properties, structure and functions 14 hours

Pigments, Phytochemicals, Flavor and odor Functional components, Its Isolation and health benefits (Soya,Oliveoil,Tea,turmeric, Commonbeans,*Capsicumannum*,Mustards,Ginseng, Garlic, Grape, Citrus fruits, Fish oils, Sea foods) formulation of Sports drink, Infant formula as functional foods. Bioavailability and safety issues of functional foods.

Unit – 3 Concept and the role of nutraceuticals and functional foods 15 hours

Nutraceuticals and functional foods for Cardiovascular diseases, Cancer, Diabetes, Cholesterol management, Obesity, Immune enhancement and Endurance performance.

Unit – 4 Probiotics,Prebiotics and symbiotics. 10 hours

Definition , functions, classifications, usage in nutraceuticals and functional food industry

Unit – 5 Food Biotechnology 13 hours

GMF- Uses and Health Hazards

National and international agencies in food safety

Dietary supplements-GMPS and shelf life of dietary supplements.

a) Role of changing food preferences and globalization on selection of nutraceutical products

b) Nutrigenomics.

PRACTICALS

- Development of functional food for
- diabetes mellitus,
- heard diseases,
- cancer and
- obesity patients

References:

1. Mary, K. Schmidl and Theodre, P. Labuza , Essentials of Functional Foods, Culinary and hospitality industry publication services,2000.
2. Mazza, G, Functional Foods- Biochemical and processing aspects, Culinary and hospitality industry publication services,1998.
3. Robert easy Wildman, Handbook of Nutraceuticals and Functional Foods, Culinary and hospitality industry publication services,2001.
4. David, H.Watson, Performance, Functional Foods, Culinary and hospitality industry publication services,2003.
5. Chatwick, R et al., Functional Foods, Springer,2003.
6. Jeffery Horst, Methods of Analysis for Functional Foods and Nutraceuticals, CRS Press,2002.

MODEL QUESTION PAPER

FIRST YEAR M.Sc CLINICAL NUTRITION

CORE THEORY PAPER-III- NUTRACEUTICALS AND FUNCTIONAL FOODS

Time: 3 Hours **Maximum Marks: 80**

LAQ **(1 x 10 = 10 marks)**

Answer any one out of two

1. List the role of Neutraceutical products in pharmacological industry
2. Elaborate the technology involved in the formation of Neutraceutical products
3. How to isolate the Anthocyanin and Carotenoids
4. Write the safety issues on functional foods
5. List the Uses of Neutraceutical products in preventing chronic disease
6. Formulate one neutraceutical and one functional food for DM patients
7. Uses of probiotic in neutraceutical industry
8. Write the health benefits of prebiotics
9. Elaborate the nutrigenomics
10. Write the parameter used to assess quality analyse

FIRST YEAR M.Sc CLINICAL NUTRITION

Core Theory Paper-III- Nutraceuticals And Functional Foods

BLUE PRINT

Unit No.	UNIT	Weightage	Marks Allotted
I	**Introduction to Nutraceuticals**	**12.5 %**	**10**
II	**Functional foods**	**25%**	**20**
III	**Concept and the role of nutraceuticals and functional foods**	**12.5%**	**10**
IV	**Probiotics, Prebiotics and symbiotic**	**25%**	**20**
V	**Food Biotechnology**	**12.5%**	**20**
	TOTAL	**100%**	**80**

- The duration of Examination (University) is Three (3) hours.
- The total marks for the University Examination will be 80 marks.

I. Long question answer : 8 X10 marks = 80 marks (8 out of 10)

TOTAL = 80 marks

CORE THEORY PAPER-IV- MEDICAL NUTRITION THERAPY -I

(THEORY)

(DURATION 64 hrs)

UNIT I- Nutritional care process: 12 Hours

Identification of high risk patients- nutritional assessment, nutritional diagnosis, nutrition intervention, monitoring and evaluation of nutritional care. Assessment components-medical and nutritional care record types and uses Format for medical and nutrition charting and documentation record. Nutritional intervention and diet modification-diet prescription, modifications of the normal diet.Nutrition care for hospitalized patients- standard hospital diet, other types of diet in hospital, modifications of food intake.

Unit – II Nutritional Clinical Therapeutics And Dietetics 14 Hours

a) Definition and history of dietetics.

Diet Modifications

a) Normal diet as a basis for therapeuticdiets
b) Modification of Normal Diet
c) Hospital diet

- Scope and importance
- Routine hospital diets
- Special feeding method

Menu Planning

a) Introduction, Menu planning, Rationale for menu planning, Factors affecting food

b) Choice, Exchange list vs food composition tables for menuplanning.

Nutrients and Drug Interaction

a) Effect of drugs on ingestion, Digestion, Absorption and metabolism of nutrients.
b) Effect of foods, nutrients and nutritional status on drug dosage and efficacy.

Unit – III- Dietary management in critically ill patients 13 Hours

Diet for cancer - Types, Etiology ,Signs and symptoms, and diagnosis of cancers.
Cancer therapy and its complications and role of diet.

Diet forburns - Classification and Complications, Metabolic changes in protein and electrolytes, Dietary management & mode of nutrition support for burns and wound management of burns.

Diet for Sepsis - Definition and Dietary management of Sepsis with or without Multiple Organ Dysfunction Syndrome (MODS).

Diet for Trauma- Physiological, metabolic and hormonal response to injury and Dietary management intrauma

Unit – IV Nutrition Management In Infection And Allergy 15Hours

Infection and fever : Defense mechanism, Metabolic changes during infection, Classification ,etiology of fever/infection and dietary management.

Food Allergy : type of allergy, type of allergens , treatment of allergy and dietary management.

UNIT – V Diet Counseling **10 Hours**

Concept, recipient and counseling environment, the problem solving counseling method. Activities for behavior changes, intervention counseling models, types of counseling session in patients. Empowerment, interpersonal skills. Diet counseling components – planning, implementation and evaluation.

REFERENCE

1. Mahan, L.K. and Escott-Stump, S. (2000): Krause's Food Nutrition and Diet-Therapy, 10th Edition, W-13 Saunders Ltd.
2. Shills, M.E., Olson, J.A, Shike, M and Ross, A.C. (2002): Modern Nutrition in Health and Disease, 9th Edition, A. vaiiiams and Willdns..
3. Sareen, S, James, J (2005). Advanced Nutrition in Human Metabolism, 4th Edition, Thomson Wordsworth Publication, USA.
4. Chandra, R.K. (eds) (2002): Nutrition and Immunology, ARTS Biomedical. St. John's New foundland.

MODEL QUESTION PAPER
FIRST YEAR M.Sc CLINICAL NUTRITION
CORE THEORYPAPER-IV- MEDICAL NUTRITION THERAPY -I

LAQ **(8 x 10 = 80 marks)**
Answer Any Eight Questions

1. Explain the steps in the assessment of high risk patients.
2. List and explain the need of documents and charts maintained by the nutritionist for the patients in the hospitals
3. Explain the types and role of routine hospital diet
4. Write the drug and nutrition interaction with four examples
5. Write the step by step process in cheese making
6. State the dietary management for any three type of cancer
7. What is sepsis and write the role of nutrients in sepsis
8. Explain the physiological changes during fever and the role of nutrients to overcome the discomfort
9. Elaborate the list under diet counseling
10. Explain any four intervention counseling models

FIRST YEAR M.Sc CLINICAL NUTRITION

Core theory PAPER-IV-Medical Nutrition Therapy –I

BLUE PRINT

Time: 3 Hours **Maximum Marks: 80**

Unit No.	Unit	Weightage	Marks Allotted
I	NUTRITIONAL CARE PROCESS	12.5%	10
II	NUTRITIONAL CLINICAL THERAPEUTICS AND DIETETICS	25%	20
III	DIETARY MANAGEMENT IN CRITICALLY ILL PATIENTS	25 %	20
IV	NUTRITION MANAGEMENT IN INFECTION AND ALLERGY	12.5 %	10
V	DIET COUNSELLING	25%	20
	TOTAL	100%	80

The duration of Examination (University) is Three (3) hours.

- The total marks for the University Examination will be 80 marks.

II. Long Answer Questions : 10X 8 marks = 80 marks (Choice 8out of 10)

TOTAL = 80 marks

FIRST YEAR M. Sc CLINICAL NUTRITION

Core Paper-V- Human Anatomy and Physiology

Section –A- Human Anatomy - Syllabus

UNIT I: General Anatomy, Histology and Embryology:

General Anatomy and Histology: Anatomical planes, Terms and Terminology, Structural classification of bones, development and growth of skeletal tissue and bones, Structural and functional classification of joints, General morphology of a synovial joint and associated structures.

General Histology: Structure and location of epithelial, connective and nerve tissues.

General Embryology: Spermatogenesis, Oogenesis, Fertilisation, Germ layers, Development of the placenta,

UNIT II: DIGESTIVE AND EXCRETORY SYSTEM

Digestive system: Macroscopic features of the mouth, salivary glands, pharynx, oesophagus, stomach, small and large intestines, liver pancreas, Biliary system and peritoneal cavity.

Urinary System: Macroscopic features of the kidneys, ureters, urinary bladder and the urethra.

UNIT III: CARDIOVASCULAR SYSTEM

Heart: Chambers of the Heart – Structure and Valves, Conducting system of Heart, Blood vessels

UNIT IV: ENDOCRINE SYSTEM

Macroscopic features, location and basic function of the hypothesis cerebri, thyroid gland, parathyroid glands, suprarenal glands, pineal gland and organs with a minor endocrine function.

UNIT V: REPRODUCTIVE SYSTEM

Male Reproductive System: Macroscopic features, and location of the scrotum, testes, epididymis, ductus deferens, seminal vesicles, prostate gland, bulbourethral gland and penis.

Female Reproductive System: Macroscopic features and location of the ovaries, uterine tubes, uterus, vagina and external genitalia.

REFERENCE BOOKS:

1. SampathMadyasthaw, "Manipal Textbook of Human Anatomy", 3rd Edition.

BLUE PRINT

Section A – Human Anatomy

Each question paper should have:

5 Short Essay questions (10 mark of each)
Out of 5 (4 questions should be answered) 4 X 10 = 40

Section A

Git, Excretory System, Cardiovascular System, Endocrine, Reproduction, General Anatomy, General Histology And Embryology

APPLIED TYPE: 10% RECALL TYPE: 10%UNDERSTANDING TYPE: 80%

MARKS DISTRIBUTION: SHORT ESSAY -5 (1 CHOICE) = 40 MARKS

REGION	MARKS DISTRIBUTION	
	Understanding	**Applied /Recall**
Unit I: General Anatomy General Histology General Embryology	10	-
Unit II:GIT&Excretory		10
Unit III: Cardiovascular System	10	-
Unit IV: Endocrine	10	
Unit V: Reproduction	10	-
	40	10

Section B- Physiology

Syllabus:

UNIT-I: General and cellular physiology: Overview of the structure organization of the human body, Cell and its functions including ,morphology, structure of cell membrane and transport across cell membrane.

UNIT-II: Blood and body fluids: Introduction to blood and plasma proteins along with the functions, functions of red blood cells, white blood cells, and platelets, blood groups; Immunity: classification and functions.

UNIT-III: Cardiovascular system: Organization of cardiovascular system, cardiac muscle properties and functions; conducting system of heart; normal electrocardiogram (draw and lebel different waves and segments; blood pressure: definition, normal range, factors regulating blood pressure.

Unit IV: Gastrointestinal system: Organization of GI system, structure and functions of different layers of GI tract, salivary glands; composition of saliva and functions; gastric secretion composition and functions; steps in HCL secretion and its regulation; exocrine pancreas, composition and functions of pancreatic juice; physiological functions of liver; digestion and absorption of carbohydrates, proteins and fats, GI motility**.**

Unit V: Excretory system: Functional organization of kidneys; physiological functions of kidneys (excretory and non- excretory);GFR definition, factors affecting and regulating GFR; tubular functions.

Section B- Physiology

Blue print

REGION	Short Essay questions
UNIT-I: General and cellular physiology:	1
UNIT-II: Blood and body fluids	1
UNIT-III: Cardiovascular system	1
Unit IV: Gastrointestinal system	1
Unit V: Excretory system:	1
	4+1(choice)

FIRST YEAR M. Sc CLINICAL NUTRITION

Core Paper-V- Human Anatomy and Physiology

Model Question Paper

Time: 3hrs **Max.Marks:80**

Section A – Human Anatomy

Short Essay Question (*Answer any 4 questions)*(4x10=40)

1. Describe the Chambers of the heart and the arteries supplying it. (6+4)
2. Classify the bones according to its structure. Write a note on blood supply of long bone (7+3)
3. Enumerate the endocrine glands and explain the structure of Thyroid gland (3+7)
4. List the male reproductive organs. Explain the structure of testis and its blood supply.(3+7)
5. Describe the parts, relations and arterial supply of stomach. Add a note on its applied significance.(7+3)

Section B-Physiology

Short Essay Question (*Answer any 4 questions)*
(4x10=40)

1. Draw a lebelled diagram showing different parts of cell. Write in brief the functions of each cell organelle. (5+5=10 marks)
2. List the constituents of blood and write one function for each. Draw a lebelled diagram explain the steps of erythropoiesis. (4+6=10 marks)
3. Define blood pressure. Write the normal values of systolic blood pressure, diastolic blood pressure, mean arterial blood pressure, and pulse pressure. Draw a lebelled diagram showing conducting system of heart. (2+3+5=10 marks)
4. Name the salivary glands. Write the composition and function of each constituent of saliva. (2+8=10)
5. Draw a lebelled diagram of nephron. Write in brief the excretory and non-excretory functions of kidney. (2+8=10 marks).

FIRST YEAR PRACTICALS :

CORE LAB- I (80 +20 IA)

- Qualitative analysis of carbohydrate, Protein and amino acids, NPN
- Normal and Abnormal urine analysis
- Estimation of glucose by anthrone method
- Estimation of vitamin C in lemon
- Estimation and quantification of starch from potato
- Clinical case discussion

CORE LAB–IV(80 +20 IA)

- Planning a Diet for Enteral feeding
- Planning a Diet for critically ill patient (Burns, Sepsis, Trauma)
- Planning a Diet for fever

DISCIPLINE ELECTIVE COURSE

SYLLABUS
DISCIPLINE SPECIFIC ELECTIVE COURSE-01
RESEARCH METHODOLOGY AND BIOSTATISTICS

CREDIT 3

UNIT I **10 HOURS**

Research Methodology : Meaning , objectives and types of research, research approaches, significance ofresearch. Research and scientific methods, research process and criteria of good research Definition and identification of a research problem – Selection of research problem, Justification , theory , hypothesis ,basic assumptions, limitations and delimitations of the problems.

UNIT II **9 HOURS**

Introduction of bio statistics – Meaning and its scope; Population and Sample, Parameter and Statistics; types of statistical data; Diagrammatic representation data; Mean, Median, Mode. Standard deviation. Coefficient of variation. Skewness and Kurtosis. Probability – Definition, Axioms of Probability; addition and Multiplicationtheorem.

UNIT III **9 HOURS**

Concept of correlation – Simple, Partial regression- Simple Methods of Association – Chi square test of association of attributes, Goodness of fit.

UNIT IV **10 HOURS**

Concept of Hypothesis – Null, Alternative Hypothesis. Type I and type II errors. Sampling distribution Standarderror t & F distribution; t test based on single samples, two sample mean. Paired samples, F test two sample variances f test for several mean (one way ANOVA only). Z – test for proportion – one sample, two sample, MS –excel support for above expression.

UNIT V **10 HOURS**

Framing proposal for acquiring grants: the question to be addressed – rationale and importance of the questionbeing addressed – Empirical and theoretical framework – Presenting pilot study / data or background information – Research proposal and time frame- Specificity of methodology- Organization of different phases of study- Expected outcome of study and its implications – Budgeting – Available infrastructure and resources –Executive summary

Text books and Reference materials

1. Bandarkar, P.L and Wilkinson T.S (2000): Methodology and Techniques of social Research , HimalayaPublishing House, Mumbai.

2. Copper, H.M.(2002) Integrating research: A guide for literature review (2nd Edition)California; Sage

3. Harman,E & Montages , L(Eds.)2007). The thesis and the book, New Delhi; Vistar.

4. Mukherjee, R(1989); the quantity of Life: Valuation in school research , Sage Publications, New Delhi.

5. Stranss, A and Corbin. J.(1990):Basis of Qualitative Research : Grounded Theory Procedures andTechniques, Sage Publications, California

GENERIC ELECTIVE COURSE-01

ENVIRONMENTAL SCIENCE

NAME OF THE SUBJECT PAPER	**: ENVIRONMENTAL SCIENCE**
DURATION OF THEORY CLASSES	**: 16 hrs**
DURATION OF PRACTICAL SESSIONS	**: 32 hrs**
EXAMINATION	**: 100 marks (80 U + 20 IA)NO**
UNIVERSITY PRACTICAL EXAMINATION	
DURATION OF THEORY EXAMINATION	**: 1 ½ hrs**
YEAR IN WHICH THE SUBJECT PAPER IS	
TAUGHT	**: II YEAR**

UNIT-I (Renewable and Non — renewable resources**)**

The multidisciplinary nature of environmental studies — Definition, scope and importance — Need for public awareness.

1 Forest resources: Use and over-exploitation, deforestation, case studies.Timber extraction, mining, dams and their effects on forests and tribalpeople.

2 Water resources: Use and over-utilization of surface and ground water,floods, drought, conflicts over water, dams-benefits and problems.

3 Mineral resources: Use and exploitation, environmental effects ofextracting and using mineral resources, case studies.

4 Food resources: World food problems, changes caused by agriculture andovergrazing, effects of modern agriculture, fertilizer-pesticide problems,waterlogging, salinity, case studies.

5 Energy resources: Growing energy needs, renewable and non-renewableenergy resources, use of alternate energy sources, case studies.

6 Land resources: Land as a resource, land degradation, man induced Landslides, soil erosion and desertification.Role of an individual in conservation of natural resources.Equitable use of resources for sustainable lifestyles.

UNIT-II (Ecosystems)

Concept of an ecosystem - Structur1e9 and function of an ecosystem Producers,

consumers and decomposers — Energy flow in the ecosystem-Ecological succession- Food chains, food webs and ecological pyramids —Introduction, types, characteristic features, structure and function of the following ecosystem:

- Forest ecosystem
- Grassland ecosystem
- Desert ecosystem
- Aquatic ecosystems (Ponds, streams, lakes, rivers, ocean estuaries)

UNIT-III (Biodiversity and its conservation)

Introduction — Definition: genetics, species and ecosystem diversity

- Biogeographically classification of India
- Value of Biodiversity: Consumptive use, productive use, social,ethicalaesthetic and option values
- Biodiversity at global, national and local levels
- India as a mega- diversity nation
- Hot-spots of biodiversity-Threats to biodiversity: habitat loss,poachingof wildlife, man wildlife conflicts
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation ofbiodiversity

UNIT-IV (Environmental Pollution)

Definition- causes, effects and control measures of:

- Air pollution
- Water pollution
- Soil pollution
- Marine pollution
- Noise pollution
- Thermal pollution
- Nuclear pollution
- Solid waste Management: causes, effects and control measures of urbanand industrial wastes — role of an individual in prevention of pollution —Pollution case studies — Disaster management: floods, earthquake, cyclone and landslides.

UNIT-V

Social Issues and the Environment: From unsustainable to sustainable development — Urban problems and related to energy — Water conservation, rain water harvesting, watershed management —Resettlement and rehabilitation of people; its problems andconcerns. Case studies - Environmental ethics: issues and possible solutions climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

- Wasteland reclamation — Consumerism and waste products —Environmental Protection Act — Air (Prevention and Control of Pollution) Act — Water (Prevention and control of Pollution) Act — Wildlife Protection Act — Forest

  Conservation Act - Issues involved in enforcement environmental legislation — Public awareness
- Human Population and the Environment: Population growth, variation among nations — Population

explosion — Family welfare Programmes —Environment and human health- Human Rights - Value Education- HIV/ AIDS - Women and Child Welfare- Role of Information Technology in Environment and Human Health — Case Studies.

FIELD WORK

1. Visit to local area to document environmental assets- river/ forest/ grassland / hill / mountain
2. Visit to a local polluted site - Urban / Rural / Industrial / Agricultural
3. Study of common plants, insects, birds
4. Study of simple ecosystems- pond, river, hill slopes, etc.

TEXT BOOKS RECOMMENDED

1. Agarwal, K.C. Environmental Science, Nidi Publishers.
2. BharuchaErach, The Biodiversity of India, Mapin Publication.
3. Brunner RC, Hazardous waste incineration, McGraw Hill Publishers.
4. Iaclhav H, Environmental Protection and Laws, Himalaya Publication.
5. Odum EP, fundamentals of Ecology, WB Sannders Publication.

TEACHING LEARNING ACTIVITIES

The course content in Environmental Studies will be covered by:

1. Interactive Lectures
2. Group Discussions
3. Field Visits

GENERIC ELECTRIVE COURSE 02

Basics of Hospital Administration

NAME OF THE SUBJECT PAPER : Basics of Hospital Administration

DURATION OF THEORY CLASSES : 64 Hrs.

EXAMINATION : 50 Marks (40 U + 10 IA)NO

UNIVERSITY PRACTICAL EXAMINATION

DURATION OF THEORY EXAMINATION : 1 ½ Hrs.

YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT : I YEAR

THEORY (DURATION 64 Hours)

COURSE OBJECTIVES

- To provide orientation about the hospital functions
- To familiarize students with the basics concepts of hospital management

UNIT: I ORGANISATION OF A HOSPITAL AND ITS DEPARTMENTS

1. Organogram
2. Vision, Mission & Values,Logo
3. Patient Service Points – Clinical & Non-Clinical (OPD's, A&E, MHC, Wards, ICU's,OT's, etc.)
4. Scope of Services (Medical & Supportive Services)

UNIT:II HOSPITAL POLICIES & PROCEDURES

1. Registration Process
2. OP/IP Billing
3. Admission Process
4. Discharge Process
5. Financial counseling
6. Visitors Policy
7. Feedback forms.

UNIT: III MEDICAL RECORDS MANAGEMENT/LEGAL ASPECTS

1.Types of Medico legal cases2.SOP's for handling MLC

3.Medical Records -Forms,consents, registers used in hospitals

UNIT:IV QUALITY MANAGEMENT

1. Quality - Brief Introduction
2. Code of Conduct for healthcare professionals3.Patient rights & responsibilities
4. Incident Reporting
5. Quality Indicators
6. List of Licenses to be obtained to run a Hospital College
7. Accreditation – ISO/NABH/JCI

UNIT: VOCCUPATIONAL SAFETY

1. Biomedical Waste Management
2. Hospital Spill Management
3. Usage of PPE
4. Emergency Codes
5. Fire Safety Management
6. Hospital Infection Control

UNIT: VIORGANISATIONAL BEHAVIOUR

1. Communication with patients/health care professionals
2. Grooming standards
3. Time Management
4. Grievance Handling, Interdisciplinary Committee
5. Leadership

LEARNING OUTCOMES

Students will have an overview of hospital functions, processes and patientmanagement.

GENERIC ELECTIVE 03
Lifestyle Disorders

NAME OF THE SUBJECT PAPER : Lifestyle Disorders

DURATION OF THEORY CLASSES : 64 Hrs.

EXAMINATION : 50 Marks (40 U + 10 IA)NO

UNIVERSITY PRACTICAL EXAMINATION

DURATION OF THEORY EXAMINATION : 1 ½ Hrs.

YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT: I YEAR

THEORY (64 Hours)

UNIT I Modern Life style disorders

Deskbound and sleeping habits, junk food, anxiety.Food poisoning, Acidity.

UNIT II Dietary disorders

Food groups and concept of a balanced diet, obesity, metabolic syndrome, hypertension- their causes and prevention through dietary and lifestyle modifications **UNIT III Social health problems**

Smoking, alcoholism, drug dependence and AquiredImmuno Deficiency Syndorme(AIDS).

UNIT IV Gastrointestinal disorders

Stomach disorders-Gastritis, Ulcer, Amoebiasis, Constipation, piles

Common ailment- cold, cough, fevers, diarrhoea, constipation- their causes anddietary treatment

Learning outcomes:

To understand the relevance, significance and implications of lifestyle disorders for the betterment of human life quality

Text Books

1. Text book of Clinical Biochemistry- Carl. A.Burtis and Edward R. Ashwood
2. Text Book of Medical Biochemistry – Dr. M.N. Chatterjee and RaneShinde

Reference Books

1. P. Singh MD. Textbook of Nutrition and Health; First Ed; 2008; Academic Excellence
2. Biochemistry with Clinical Correlation- Thomas M. Devlin

SECOND YEAR

CORE THEORYPAPER-VI- FOOD MICROBIOLOGY

(THEORY)(DURATION 64 hrs)

UNIT I **12 hours**

Importance and significance of microorganisms in food science. Micro-organisms importance in food - Factors affecting the growth of micro-organisms in food - Intrinsic and Extrinsic parameters that affect microbial growth.

UNIT II **14 hours**

Determination of micro-organisms and their products in food: Sampling, sample collection, transport and storage, sample preparation for analysis. Microscopic and culture dependent methods- Direct microscopic observation, culture, enumeration and isolation methods; Chemical and Physical methods-Chemical, immunological and nucleic acid based methods; Culture independent techniques – PCR Based, DGGE, Metagenomics, etc.; Analytical methods Formicrobial metabolites- microbial toxins and metabolites.

UNIT III **13hours**

Protection and preservation of Foods: Chemical, Modified atmosphere, Radiation in foods from the microbiological angle. Indicators of water and food safety and quality: Microbiological criteria of foods and their Significance. The HACCP and ISO systems for food safety.

UNIT IV **12 hours**

Food spoilage: characteristic features, dynamics and significance of spoilage of different groups of foods - Cereal and cereal products, vegetables and fruits, meat poultry and sea foods, milk and milk products, packed and canned foods.

UNIT V **13 hours**

Food borne diseases: *Bacterial food borne diseases* (Staphylococcalintoxification, Botulism, Salmonellosis, Shigellosis, Enteropathogenic Escherichia Coli Diarrhoea, Clostridium Perfringens gastroenteritis, Bacillus cereus Gastroenteritics) *Food Borne Viral Pathogens* (Norwalk virus, Norovirus, Reovirus, Rotavirus, Astrovirus, Adenovirus, Parvovirus, Hepatitis A Virus) *Food Borne Animal Parasites* Protozoa – Giardiasis, Amebiasis, Toxoplasmosis, Sarcocystosis, Crypotosporiodiosis. Cysticercosis/Taeniasis. Roundworm – Trichinosis, Anisakiasis.*Mycotoxins:* Aflatoxicosis, DeoxynivalenolMycotoxicosis, Ergotism

REFERENCES

1. Pelezar, M.I and Reid, R.D. (1993) Microbiology McGraw Hill Book Company, New York, 5th Edition.
2. Jay, James, M(2000) Modern Food Microbiology, 2nd Edition. CBS Publisher
3. Adams, M.R. and M.G. Moss (1995): Food Microbiology, 1st Edition, New Age International (P) Ltd.
4. Frazier, W.C. (1988) Food Microbiology, McGraw Hill Inc. 4th Edition.
5. Doyle, P. Bonehat, L.R. and Mantville, T.J-(1997): Food Microbiology, Fundamentals and Frontiers, ASM Press, Washington DC.

MODEL QUESTION PAPER
SECOND YEAR M.Sc CLINICAL NUTRITION
CORE THEORYPAPER-VI- FOOD MICROBIOLOGY

LAQ **(8 x 10 = 80 marks)**
Answer Any Eight Questions

1. Factors affecting the growth of microorganism.
2. Role of microorganism in the food industry
3. List the steps and explain each steps for sample collection
4. Elaborate the Culture independent techniques
5. Explain the HACCP steps
6. Explain the role of microorganism in the food preservation
7. List factors involving in the food spoilage
8. Elaborate the canning method
9. How to control the food borne diseases
10. What are *Food Borne Animal Parasites*

SECOND YEAR M.Sc CLINICAL NUTRITION
CORE THEORYPAPER-VI- FOOD MICROBIOLOGY

BLUE PRINT

Time: 3 Hours **Maximum Marks: 80**

Unit No.	Unit	Weightage	Marks Allotted
I	Importance and significance of microorganisms in food science	**12.5%**	**10**
II	Determination of microorganisms and their products in food	**25%**	**20**
III	Protection and preservation of Foods	**25 %**	**20**
IV	Food spoilage	**25 %**	**20**
V	Food borne diseases	**12.5%**	**10**
	TOTAL	**100%**	**80**

- The duration of Examination (University) is Three (3) hours.
- The total marks for the University Examination will be 80 marks.

III. Long Answer Questions : 10X 8 marks = 80 marks (Choice 8out of 10)

TOTAL = 80 marks

CORE THEORY PAPER-VII- NUTRITION THROUGH LIFE CYCLE

(THEORY)(DURATION 64 hrs)

UNIT-I **12 hours**

Nutrition in Pregnancy

a) Reproductive Physiology
b) Stages of gestation, maternal weight gain
c) Physiology of pregnancy, nutritional requirements and dietary guidelines during and prior to pregnancy
d) Nutrition related complications with special focus to Adolescent Pregnancy and general complications of pregnancy
e) HIV/AIDS during pregnancy – Dietary concerns
f) Role of Exercise & Fitness during pregnancy

UNIT-II Nutrition during Lactation **14 hours**

a) Physiology of Lactation, hormonal control and reflex action
b) Human milk composition
c) Nutritional requirements & dietary guidelines
d) Benefits of Breast Feeding
e) Galactogouges
f) Lactation Management in Normal & Special conditions

UNIT-III Nutrition in infancy **12 hours**

a) Infant feeding and nutrient needs
b) Feeding in early and late infancy and Feeding problems and Weaning foods
c) Common nutrition problems
d) Feeding Preterm and low birth weight infants

UNIT-IV Nutrition in Preschool, Childhood and Adolescents **14 hours**

a) Growth and development and Nutritional requirements
b) Nutrition for children with special health care needs
c) Feeding problems
d) Factors to be considered for menu planning and packed lunch
e) Nutritional concerns and prevention of nutrition related disorders
- Obesity – underweight
- Deficiency condition
- Allergies

Nutrition in adolescence

a) Growth and development
b) Physiological and Psychological changes
c) Nutritional requirements of adolescents

Nutrition situation with special needs in adolescence

a) Pregnancy
b) Eating disorders
c) Obesity – underweight
d) Deficiency conditions

UNIT-V Nutrition in Adult and Aging/Elderly

12 hours

Nutrition in Adult

Physiological and Psychosocial changes

b) Common nutritional concerns

c) Nutritional requirements and dietary recommendation

d) Physical Activity in adulthood

Nutrition in Aging/Elderly

a) Theories of Aging, Physiological and Psychosocial changes

b) The Aging Process

c) Nutritional requirements of the Elderly

d) Nutrition care

Nutrition needs during illness and chronic conditions

a) Sensory loss, Oral health and GI functions

b) Neuromuscular and skeletal functions

c) Renal and cardiac function

d) Immuno-competence

REFERENCES

1. Mahan, L.K., Arlin, M.T., Krause's Food, Nutrition and Diet Theraphy, W.B. Saunders Company, London Publications, 8th edition, 1992.

2. **Robinson, C.H., Chenoweth, W.L. and Garwivk, A.E.** Normal and Therapeutic Nutrition, MacMillan Publishing Co., 17th edition, 1986.

4. **Joshi, S.A., Nutriton and Dietetics,** Tata McGraw Hill Publications, New Delhi, 2004.

5. **Srilakshmi B.,** Dietetics, New Age International (P) limited Publications, 2004.

6. **Paul. S.,** Textbook of Bio-Nutrition.

MODEL QUESTION PAPER

SECOND YEAR M.Sc CLINICAL NUTRITION

CORE THEORY PAPER-VII- NUTRITION THROUGH LIFE CYCLE

LAQ **(8 x 10 = 80 marks)**

Answer Any Eight Questions

1. Explain the physiological changes during pregnancy
2. Elaborate the nutritional requirement during pregnancy.
3. Explain the role of hormone in lactation and elaborate the role of sucking reflex
4. What is Galactogouges and write the benefits of breast milk towards mother and the child
5. Define weaning food and write the factors to be consider for weaning foods
6. What the nutritional parameter can be done to analyses the nutritional status of the infants
7. Write the Nutrition for children with special health care needs
8. Explain the Nutrition situation with special needs in adolescence
9. Write the Theories of Aging, Physiological and Psychosocial changes
10. Elaborate the nutritional requirement depends on the physical activity for the adult population.

SECOND YEAR CLINICAL NUTRITION
CORE THEORY PAPER-VII - NUTRITION THROUGH LIFE CYCLE

Time: 3 Hours **Maximum Marks: 80**

Unit No.	Unit	Weightage	Marks Allotted
I	**Nutrition in Pregnancy**	**25%**	**20**
II	**Nutrition during Lactation**	**12.5%**	**10**
III	**Nutrition in infancy**	**12.5 %**	**10**
IV	**Nutrition in Preschool ,Childhood and adolescents**	**25 %**	**20**
V	**Nutrition in adult and Aging/Elderly**	**25%**	**20**
	TOTAL	**100%**	**80**

The duration of Examination (University) is Three (3) hours.

- The total marks for the University Examination will be 80 marks.

IV. Long Answer Questions : 10X 8 marks = 80 marks (Choice 8out of 10)

TOTAL = 80 marks

CORE THEORY PAPER-VIII- PUBLIC HEALTH NUTRITION

(THEORY)(DURATION 64 hrs)

Unit – 1 **10 hours**

Concept of Public Health Nutrition

a) Relationship between health and nutrition

b) Role of public health nutritionist in the health care delivery system.

Population Dynamics

a) Demography and Demographic cycle, nutrition epidemiology

b) World population trend

- Birth rates, Death rates, Growth rates and Demographic trends in India

Age pyramid, sex ratio and Human Development Index

Unit – 2

Assessment of Nutritional Status (ABCDE) 15 hours

a) Methods of Nutritional assessment, Nutritional anthropometry and Growth standards,

b) Dietary and clinical assessment

c) Biochemical and radiological assessment

d) Rapid Assessment Procedure (RAP)

e) Definition for Acute, Chronic and Epidemic

Nutritional surveillance

a) Need for nutritional surveillance

Key indicators of nutritional surveillance programme

Unit – 3

Nutritional Problems In India And Policies And Programmes 15 hours

- Common nutritional problems (PEM, Micronutrient deficiency and Chronic disease) – Ecology, prevalence ,clinical manifestation, consequences treatment of malnutrition.

National nutritional policy and intervention programme –

a) Aim, objectives, guidelines and thrust areas.

b) PDS - Public distribution system and Agricultural planning – New strategies

Nutrition intervention Programmes

a) Objectives

b) Operation of feeding programmes

- ICDS, Anganwadi, AYUSH, National Rural Health Mission and TINP

National organizations - ICMR, NIN, NNMB, ICAR, CFTRI, NIPCCD and Pradhan Mantri Gramodaya Yojana (PMGY), NIN, CFTRI, ICMR, ICAR,CHEB,NIPCCD,DFRL,NGOs

International organizations - FAO, WHO, UNICEF UNESCO, World Bank,FAO, WHO, UNICEF, CARE, AFPRO, CWS, CRS, World Bank and others.

Unit – 4 12 hours

Nutrition Education

a) Need, Scope, Importance and Theories of nutrition education

b) Process of nutrition education.

Nutrition education communication

a) Programme, formulation, Implementation and evaluation.

Primary HealthCare (PHC) and its role in preventing communicable and non- communicable diseases

Unit-5.Food Availability and Factors Affecting Food Availability and Intake. 12 hours

Agricultural production, post-harvest handling (storage & treatment), marketing and distribution, Industrialization, Population, Economic, regional and socio-cultural factors, Strategies for augmenting

food production, Control of Food losses- Agencies to control food losses, Food security and adequacy of diets. Food Security Bills and Intra Household Food Distribution Practices

References:-

1. Owen, A.Y. and Frackle, R.T., (2002): Nutrition in the Community. The Art of Delivering Services, 2nd Edition Times Mirror/Mosby.
2. Part, K. (2000): Part's Textbook of Preventive and Social Medicine, 18th Edition, M/s. BanarasidasBhanot, Jablpur.
3. Beaton, G.H. and Bengoa, J.M. (Eds) (2000): Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
4. Bamji, M.S., Rao, P.N., Reddy, V (Eds) (2003): Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.Daryab Singh Principles of Statistics, Atlantic Publishers &Distributors.
5. Bernard Ostle Statistics inResearch

MODEL QUESTION PAPER
SECOND YEAR M.Sc CLINICAL NUTRITION
CORE THEORY PAPER-VIII- PUBLIC HEALTH NUTRITION

Time: 3 Hours **Maximum Marks: 80**

MODEL QUESTION PAPER

LAQ **(8 x 10 = 80 marks)**
Answer any 8 out of 10

1. Explain The Role of public health nutritionist in the health care delivery system
2. Explain Demography and Demographic cycle, nutrition epidemiology
3. Elaborate Methods of Nutritional assessment
4. Write the Need for nutritional surveillance
5. Explain the Common nutritional problems in India
6. Elaborate any four National organizations
7. Write the Need, Scope, Importance and Theories of nutrition education
8. What is Primary Health Care (PHC) and its role in preventing communicable and non- communicable diseases
9. How to Control of Food losses and list the Agencies to control food losses
10. Explain the Food Security Bills and Intra Household Food Distribution Practices

BLUE PRINT
SECOND YEAR M.Sc CLINICAL NUTRITION
CORE THEORY PAPER-VIII- PUBLIC HEALTH NUTRITION

Unit No.	Unit	Weightage	Marks Allotted
I	**Concept of Public Health Nutrition**	**12.2 %**	**10**
II	**Assessment of Nutritional Status**	**25%**	**20**
III	**Nutritional Problems In India And Policies And Programmes**	**25%**	**20**
IV	**on Education**	**12.5%**	**10**
V	**Food Availability and Factors Affecting Food Availability and Intake.**	**25%**	**20**
	TOTAL	**100%**	**80**

- The duration of Examination (University) is Three (3) hours.
- The total marks for the University Examination will be 80 marks.

V. Long question answer : 8 X10 marks = 80 marks (No Choice)

TOTAL = 80 marks

CORE THEORY PAPER-IX- Medical Nutrition Therapy II

(THEORY)(DURATION 64 hrs)

UNIT 1. Dietary Management for G I Diseases 17 hours

Pathophysiology and dietary management of GI Tract Diseases - Anatomic, Physiologic and Functional Changes, Impact on Nutritional Status, Diseases of GI track - Esophagitis, Dyspepsia, GERD, Peptic Ulcer, Gastritis, Dumping Syndrome, Flatulence, Diarrhoea, Constipation, Deuodinal Ulcer, Inflammatory Bowel Disease,- Crohn's disease Ulcerative Colitis, Irritable bowelsyndrome Celiac Sprue, Tropical Sprue, Steatorrhoea

Gout- Role of protein &purine, Etiology, Symptoms &complication and its dietary Management. Inborn errors of metabolism: PKU, MSUD, Galactosemia and lactose intolerances and dietary management

UNIT 2. Dietary Management In Diseases of The Liver, Pancreas And Biliary System 15 hours

Pathophysiology and dietary management for Liver Diseases- Progression of Liver Disease Metabolic And Nutritional Implications, Role of Specific Nutrients And Alcohol, Viral Hepatitis, Cirrhosis of Liver, Hepatic Encephalopathy. Diseases of Gall Bladder and Pancreas- Pathophysiologic Changes, Metabolic and dietary management: Cholelithiasis, Cholecystitis, Cholecystectomy, Pancreatitis.

UNIT 3. Dietary Management for Diabetes Mellitus 10 hours

Prevalence & Classification, Etiology, Physiological symptoms and disturbances, Complications, Dietary Management of Diabetes Mellitus, Diet Plan-Food exchange list, Glycemic Index.

UNIT 4. Dietary Management for Heart Disease (CHD) 10 hours

Pathogenesis, role of nutrients in prevention - metabolic and nutritional implications,. Coronary Heart Disease (CHD) Prevalence, Etiology & risk factors and dietary management Common disorders of CHD and dietary management for Dyslipidemias, Atherosclerosis, Hypertension- DASH diet, Ischemic heart disease –Angina, Myocardial Infarction, Congestive Heart failure, Rheumatic Heart Disease.

UNIT 5. Dietary Management for Renal Disease 12 hours

Diseases of the renal system - etiology and pathogenesis - changes in function with progression of diseases, metabolic and nutritional implications, Clinical and metabolic manifestations, Acute and Chronic Nephritis, Nephrotic syndrome, Renal failure-acute and chronic renal failure, Acute and Chronic Nephritis, Nephrolithiasis –Types and management.

REFERENCE:

1. Mahan L.K., Sylvia Escott-Stump (2000): Krause‟s Food Nutrition and Diet Therapy 10th Edition, W.B. Saunders CompanyLondon.
2. B. Srilakshmi, (2007): Dietetics, published by K.K. Gupta For New Age International Pvt. Ltd. NewDelhi.
3. Sue Rodwell Williams, (1993): Nutrition, Diet Therapy, (7th Ed) : W.B. Saunders CompanyLondon.
4. Antia F.P. And Philip Abraham (2001) Clinical Nutrition and Dietetics, Oxford PublishingCompany.
5. Gopalan C., Ram Sastri B.V. And BalSubramaniam S.C., (2006) Nutritive Value of Indian Foods, Hydrabad, National Institute of Nutrition, Indian Council of MedicalResearch.

MODEL QUESTION PAPER
SECOND YEAR M.Sc CLINICAL NUTRITION
CORE THEORY PAPER-IX- Medical Nutrition Therapy II

LAQ **(8 x 10 = 80 marks)**
Answer Any Eight Questions

1. Explain the Pathophysiology and dietary management of peptic ulcer
2. Elaborate the Inborn errors of metabolism.
3. Explain the Diseases of Gall Bladder and Pancreas
4. Explain the Role of Specific Nutrients And Alcohol in liver disease
5. Dietary management for type II DM
6. Explain the complications for DM patients
7. Write the Pathogenesis, role of nutrients in prevention for CHD
8. Explain the dietary management for atherosclerosis.
9. Write nutritional implications for CKD
10. Write the causes for the AKD

BLUE PRINT
SECOND YEAR M.Sc CLINICAL NUTRITION
CORE THEORY PAPER-IX- Medical Nutrition Therapy II

Time: 3 Hours **Maximum Marks: 80**

Unit No.	Unit	Weightage	Marks Allotted
I	DIETARY MANAGEMENT FOR G I DISEASES	25%	20
II	DIETARY MANAGEMENT IN DISEASES OF THE LIVER,	12.5%	10
III	PANCREAS AND BILIARY SYSTEM	12.5 %	10
IV	DIETARY MANAGEMENT FOR DIABETES MELLITUS	25 %	20
V	DIETARY MANAGEMENT FOR HEART DISEASE (CHD)	25%	20
	TOTAL	100%	80

- The duration of Examination (University) is Three (3) hours.
- The total marks for the University Examination will be 80 marks.

VI. Long Answer Questions : 10X 8 marks = 80 marks (Choice 8out of 10)

TOTAL = 80 marks

SECOND YEAR M.Sc CLINICAL NUTRITION

PRACTICALS:

CORE LAB-VII (80+20)

1. Planning, preparing and serving a meal for a pregnant woman.
2. Planning, preparing and serving a meal for a lactating woman.
3. (a). Planning, preparing and serving a meal for an infant.
(b). Planning and preparing an indigenous weaning mix.
4. Planning, preparing and serving a meal for a preschooler.
5. Planning, preparing and serving a meal for a school going child (boy and a girl).
6.(a). Planning, preparing and serving a meal for an adolescent.
b). Planning and preparation of any five packed lunches
7. Planning, preparing and serving a meal for an adult (sedentary, moderate and heavy worker).
8. Planning, preparing and serving a meal for an adult (sedentary, moderate and heavy worker).

CORE LAB-IX (80+20)

- Routine hospital diets
- Diet preparation for Diabetes Mellitus,
- Cardiovascular Disease,
- Renal Disease,
- Liver Disorder And
- Peptic Ulcer

SYLLABUS

DISCIPLINE SPECIFIC

ELECTIVE COURSE-02 SPORTS NUTRITION

SYLLABUS

UNIT I: INTRODUCTION

a. Nutritional considerations for sports / exercising person as compare to normal active person.
b. Energy substrate for activities of different intensity and duration, aerobic and anaerobic activities.
c. Fluid balance in sports and exercise, importance, symptoms and prevention of dehydration, Sports drink

UNIT II: MACRO NUTRIENTS

a. Carbohydrate as an energy source for sport and exercise.
b. Carbohydrate stores,
c. Fuel for aerobic and anaerobic metabolism
d. Glycogen re-synthesis and CHO Loading
e. CHO composition for pre exercise, during and recovery period.
f. Diets for persons with High energy requirements, Stress, Fracture and Injury

UNIT III: PROTEIN AND AMINO ACID REQUIREMENTS

a. Factors affecting Protein turnover
b. Protein requirement and metabolism during endurance exercise
c. Resistance exercise and recovery process.
d. Protein supplement.

UNIT IV: ROLE OF FAT AS AN ENERGY SOURCE FOR SPORTS AND EXERCISE

a) Fat stores,
b) Regulation of fat metabolism
c) Factors affecting fat oxidation (intensity, duration , training status, CHO feeding)
d) Effect of fasting and fat ingestion

UNIT V: IMPORTANT MICRONUTRIENTS FOR EXERCISE

a) B complex vitamin and specific minerals.

b) Exercise induced oxidative stress and role of antioxidants

c) Chronic dieting and eating disorder.- female athletic triad and sports anemia

d) Dietary supplements and different nutragenic / ergogenic aids (commercial supplements, sports drinks, sports bars etc)

TEXT BOOK/REFERNECE BOOK

1. Srilakshmi et al. - Exercise Physiology, Fitness and Sports Nutrition, 2016, New Age International Private Limited .
2. Dan Benardot – Advanced Sports Nutrition, 2011, 2 edition Human Kinetics.
3. Suzanne Girard Eberle – Endurance Sports Nutrition, 2013, 3rd edn. Human Kinetics.
4. Nancy Clarke's- Sports Nutrition Guidebook, 2015, 3rd edn. Human Kinetics, Inc.
5. Anita Bean – A Complete Guide to Sports Nutrition, 8 edition , 2017, Bloomsbury Sport .
6. Louise Burke – Clinical Sports Nutrition, 2018, 5th edn. Human Kinetics.

BLUE PRINT PAPER-SPORTS NUTRITION

Unit No.	Unit	Weightage	Marks Allotted	Question type
				LA (8 out of 10)
I	Introduction	**12.5%**	**10**	**1+1***
II	Macro nutrients	**25%**	**20**	**2**
III	Protein and amino acid requirements	**25 %**	**20**	**2**
IV	Role of fat as an energy source for sports and exercise	**25 %**	**20**	**2**
V	Important micronutrients for exercise	**12.5%**	**10**	**1+1***
	TOTAL	**100%**	**80**	**10**

The duration of Examination (University) is Three (3) hours.

- The total marks for the University Examination will be 80 marks.

VII. Long Answer Questions : 10X 8 marks = 80 marks (Choice 8out of 10)

TOTAL = 80 marks

MODEL QUESTION PAPER
SECOND YEAR CLINICAL NUTRITION
DISCIPLINE ELECTIVES-SPORTS NUTRITION

LAQ **(8 x 10 = 80 marks)**
Answer Any Eight Questions

1. Describe the role of diet in sports performance?
2. What is the role of various elements of diet on the performance of an athlete?
3. In sports such as Boxing & Wrestling, the players tend to lose weight sharply. Explain pitfall of dieting?
4. Critically explain the use of dietary supplements in heavy dose for longer duration. Justify your answer with two suitable examples.
5. Elaborate on the energy expenditure and carbohydrate metabolism during physical activity.
6. Elaborate on the effect of exercise on protein requirement and sports performance.
7. Explain the weight reduction programs for young athletes
8. Explain the type of diet recommended during training and prior to competition.
9. Bring out the role of nutrition in improving sports performance.
10. Enumerate the types of exercise.

SKILL BASED ELECTIVE COURSES
II YEAR

SEC 01: BASIC LIFE SUPPORT

NAME OF THE SUBJECT PAPER : Basic Life Support

DURATION OF THEORY CLASSES : 64 Hrs

THEORY EXAMINATION : 50 Marks (40 U + 10 IA)

PRACTICAL EXAMINATION : NIL

DURATION OF THEORY EXAMINATION : 1 1⁄2 Hrs

COURSE DESCRIPTION

The course is designed to assist students to acquire knowledge of Basic life support (BLS). BLS is the foundation for saving lives after cardiac arrest. They will learn the skills of high –quality cardiopulmonary resuscitation (CPR) for victim of all ages and will practice delivery of these skills both as a single rescuer and as a member of a multi rescuer team. The skill that they learn from this course will enable them to recognize cardiac arrest, active the emergency response system early, and respond quickly and confidently

OBJECTIVES

- Describe the importance of high – quality CPR and its impact on survival
- Describe all of the steps of the chain of survival
- Apply the BLS concepts of the chain of survival
- Perform high quality CPR for adult, child & infant
- Describe the importance of team in multi rescuer resuscitation
- Describe the technique for relief of foreign-body airway obstruction for adult or child
- Describe the technique for relief of foreign-body airway obstruction for an infant
- Describe the importance of early use of an automated external defibrillator (AED)
- Demonstrated the appropriate use of an AED.

SEC 02 : ENGLISH

NAME OF THE SUBJECT PAPER : ENGLISH

DURATION OF THEORY CLASSES : 16 hrs

DURATION OF PRACTICAL SESSIONS : 34 hrs

EXAMINATION : 100 marks (80 U + 20 IA)NO

UNIVERSITY PRACTICAL EXAMINATION

DURATION OF THEORY EXAMINATION : 1 ½ hrs

YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT : I YEAR

SYLLABUS

(THEORY& PRACTICALS = 16 +34 Hours)

COURSE DESCRIPTION: This course is designed to build spoken and written English competency of the students needed to function effectively in academic setup.

OBJECTIVES: On completion of this subject, the student will be able to:

1. Speak and write grammatically correct sentences in English.
2. Develop effective writing skills.
3. Build fluency in English

UNIT : I GRAMMAR

1. Remedial Grammar : Parts of speech; Types of sentences, question tags
2. Modal verbs;
3. Tenses
4. Concordance

UNIT : II VOCABULARY

1. Word formation – prefixes and suffixes
2. Medical terminology
3. Words often misused or confused
4. Idioms and phrases

UNIT : III WRITING SKILLS

1. Letter writing - permission, leave and other official letters
2. Note making methods
3. Jumbled sentences - cohesion
4. Paragraph Writing

UNIT : IV SPOKEN COMMUNICATION

1. Pronunciation of commonly mispronounced words
2. Day to day conversation
3. Telephonic conversations
4. Group Discussions

UNIT : V LISTENING AND READING SKILLS

1. General Listening and reading comprehension

Textbook Recommended

1. Effective English Communication by Krishna Mohan and Meenakshi Raman, TataMcGraw – Hill Publishing Company Limited, New Delhi.

2. English for Colleges and Competitive Exams by Dr. R. Dyvadatham, EmeraldPublishers.

SEC-03 Basics of Yoga and Practice

NAME OF THE SUBJECT PAPER : Basics of Yoga and Practice

DURATION OF THEORY CLASSES : 16 Hrs.

DURATION OF PRACTICAL SESSIONS : 32 Hrs.

EXAMINATION : 50 Marks (40 U + 10 IA)NO

UNIVERSITY PRACTICAL EXAMINATION

DURATION OF THEORY EXAMINATION : 1 ½ Hrs.

YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT : I YEAR

THEORY & PRACTICALS (DURATION 16 + 32 Hours)

Unit	TIME(HRS)	CONTENT
1	1	Introduction to Yoga philosophy, psychology and lifestyle
2	1	A brief outline of the history of Yoga.
3	1	Cultivation of correct psychological attitudes
4	1	Asanas : Definition, Types, scope and limitations of Asanas
5	1	Pranayamas and their significance in Yogic curriculum,Types & phases of Pranayama.
6	1	Dharna and Dhyana as the keys to unlocking human potential.
7	1	Study of various aspects of Yoga: Kriyas, Bandhas, Mudras
8	1	Yoga defined as “Integration” and “Harmony”
9	1	Meaning of the term “Positive Health”
10	1	Yoga, a tool to restore homeostasis
11	1	Integration of Yoga into Health Professions Education
12	1	Order of teaching the Yogic practices; Do’s and Dont’s of specificYoga techniques.
13	2	Applied aspects of Yoga in various human activities like therapeutics, education and sports
14	2	Introduction to yogic concept of health and disease

Unit 15: Introduction to Yogic techniques: Methods and practices (32 hours)

Asanas (26 hrs):

- Aruna Surya Namaskar
- Ardha – Padmasana/Padmasana
- ArdhakatiChakrasana
- Pada Hasta
- PavanaMuktasana
- Trikona
- Navasana
- Ardha – Shalabhasana
- Shalabhasana
- Makarasana
- Bhujangasana
- Dhanurasana
- Vakrasana
- Vrikshasana
- Ushtrasana
- Gomukasana
- Yoga Mudra.
- Natarajasana
- Chakrasana
- Sarvangasana
- Matsyasana
- Halasana
  Shavasana

Pranayama (6 hrs)

- Vibhaga Pranayama
- Pranava Pranayama
- Savitri Pranayama
- Chandra and Surya Nadi Pranayama
- Nadi – Shuddhi
- Sheetali and Sitkari

PRESCRIBED TEXT BOOKS

- Dayanidy G and Bhavanani AB. CYTER Practical Book. Pondicherry, India:Dhivyananda Creations; 2016.
- A primer of Yoga Theory – Dr Ananda BalayogiBhavanani, DhivyanandaCreations, Pondicherry-13
- Fundamentals of Yoga History- Compilation by MeenaRamanathan
- Basic Hatha Yoga lessons (Tamil) - Dr Ananda Balayogi and MeenaRamanathan,Puducherry

BOOKS RECOMMENDED FOR STUDIES AND REFERENCE

1. A yogic approach to stress-Dr Ananda BalayogiBhavanani, Ananda Ashram,Pondicherry
2. Asana, Pranayama, Mudra and Bandha. Swami Satyananda, Bihar School ofYoga, Monger
3. ASANAS : WHY? AND HOW? – by Shri. O.P. Tiwari. Kaivalyadhama, Lonavla.
4. Hatha Yoga practices of the Gitananda tradition by Dr Ananda BalayogiBhavanani
5. Ramanathan Meena. Applied Yoga: Applications of Yoga in Different Fields ofHuman Activities. 3rd Ed; Pondicherry, India: Sri Balaji Vidyapeeth; 2018
6. PRANAYAMA – by Swami Kuvalayananda. Kaivalyadhama, Lonavla.
7. Yoga and sports- Swami Gitananda and Meenakshi Devi, Ananda Ashram,Pondicherry